

Oracle® Communications

Local Service Management System Alarms and Maintenance Guide



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My Oracle Support

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- For Non-technical issues such as registration or assistance with My Oracle Support, select **2**.
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You are connected to a live agent who can assist you with My Oracle Support registration and opening a support ticket.

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What's New in This Guide

This section introduces the documentation updates for Release 14.0 in Oracle Communications LSMS Alarms and Maintenance Guide.

Release 14.0 - F90365-06, February 2025

Added the resolution for a known issue wherein an alarm is observed as `hastatus` command sometimes reports status as `UNINITIALIZED`, which is not the correct status, in the [Resolution Of Known Customer Issues](#) section.

Release 14.0 - F90365-05, December 2024

- Updated the sample command for `EndNPB` parameter for the `report` command in the [report](#) section.
- Updated the location of the files for the `report` command in [Files:report](#).

Release 14.0 - F90365-04, September 2024

- Updated the information about the configured MySQL users in step 2 in the [Displaying All LSMS User Accounts](#) section.
- Updated step 2 in the [Starting the SNMP Agent](#) section to provide information about a warning that is raised on starting the services `$LSMS_DIR` and `lsmsSNMP` start.
- Added a note in the [Starting a Web-Based LSMS GUI Session](#) section to provide information about accessing LSMS GUI regardless of the Java version.

Release 14.0 - F90365-03, May 2024

Added the [Accessing GUI on Java8](#) section to list the steps to access LSMS GUI on the latest java8 release.

Release 14.0 - F90365-02, January 2024

Made formatting changes.

Release 14.0 - F90365-01, January 2024

- Added the step to restart `TKLCSnmp` in [NMS Configuration](#) section.
- Added a note in [Managing the System Clock](#) section, stating that `ntpd` is replaced by `chronyd` daemon as the default NTP client on OL8.
- Updated the command to log in to `lsmspri` as root in [Verifying NTP Service](#) section.
- Updated the commands in the procedure to verify if the daemon is terminated in the [Reference Time Off By More Than Twenty Minutes](#) section.

1

Introduction

This chapter contains general information, such as an overview of the manual, how the manual is organized, and how to get technical assistance.

1.1 Overview

This manual contains the information necessary for system administration of Oracle Communications LSMS. Included are an overview of the **LSMS** design, routine operation procedures, preventive maintenance techniques, corrective maintenance procedures, and appendixes that describe LSMS commands and notifications.

1.2 Scope and Audience

This manual is written for system administrators of the **LSMS**. The manual provides routine operating procedures as well as preventive and corrective procedures that aid administrators maintaining the **LSMS**.

- *Preventive maintenance* procedures are routines implemented on a scheduled basis to help prevent system faults. These tasks are industry standard recommendations and are adaptable to any company's maintenance plan.
- *Corrective maintenance* procedures are those used in response to a system alarm or output message. These procedures are **LSMS**-specific and aid in the detection, isolation, and repair of faults.

The manual assumes the system administrator is familiar with the Linux operating system.

1.3 Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

Table 1-1 Admonishments

Icon	Description
 DANGER	Danger: (This icon and text indicate the possibility of <i>personal injury</i> .)
 WARNING	Warning: (This icon and text indicate the possibility of <i>equipment damage</i> .)

Table 1-1 (Cont.) Admonishments

Icon	Description
 CAUTION	Caution: (This icon and text indicate the possibility of <i>service interruption</i> .)
 TOPPLE	Topple: (This icon and text indicate the possibility of <i>personal injury and equipment damage</i> .)

1.4 Manual Organization

The manual contains the following chapters:

- [Introduction](#) contains general information about the organization of the manual, how to get technical assistance, and a description of the **LSMS** document suite.
- [LSMS Overview](#) provides a high-level overview of the **LSMS** hardware and software design for high availability and an overview of software components.
- [Routine Procedures](#) explains the routine procedures that system administrators regularly perform, such as establishing remote logins, setting the system clock, and managing user accounts.
- [Preventive Maintenance](#) explains preventive maintenance topics, such as the **LSMS** preventive maintenance schedule, backup procedures, routine cleaning, and monitoring the hardware and network.
- [Restarting Software Processes](#) explains how to verify whether software processes are running and how software processes can be automatically or manually restarted.
- [Managing Server States](#) describes how automatic switchover occurs for certain failure conditions and how to manually manage the states of the primary and secondary servers.
- [Recovering from Site Failures](#) describes and compares various backup strategies for disaster situations in which an entire **LSMS** site can no longer function. This chapter describes how to prepare for disaster recovery and, for each disaster recovery strategy, describes the recovery procedures and a list of assumptions.
- [Verifying Recovery](#) describes the processes used to verify that recovery is acceptable after recovering from site failures.
- [Field Replaceable Units](#) describes the components of an E5-APP-B card that can be replaced in the field and includes procedures for replacing each type of field replaceable unit (FRU).
- [Commands](#) describes the purpose and syntax for all **LSMS** commands and provides sample output for each.
- [Automatic Monitoring of Events](#) describes how the **LSMS** automatically monitors itself for certain events, including error conditions, and reports those events with graphical user interface (**GUI**) notifications, Surveillance notifications, and/or traps sent to a remote monitoring device. This appendix lists all events in numerical order and provides explanations and suggested recovery for each event.
- [Downloading Files from an NPAC to the LSMS](#) contains the prerequisite information and procedure needed for downloading files from Number Portability Administration Centers

(NPACs). One example for using this procedure is when all the files for an entire regional database need to be downloaded as part of recovering after a site failure.

- [Worksheets](#) contains blank worksheets that you can copy and use in the procedures described in other chapters.
- [Query Server Maintenance Procedures](#) contains detailed, step-by-step procedures for maintaining the Oracle Communications LSMS Query Server (LSMS Query Server).

1.5 Related Publications

For information about additional publications related to this document, refer to the Oracle Help Center site. See [Locate Product Documentation on the Oracle Help Center Site](#) for more information on related product publications.

1.6 Locate Product Documentation on the Oracle Help Center Site

Oracle Communications customer documentation is available on the web at the Oracle Help Center (OHC) site, <http://docs.oracle.com>. You do not have to register to access these documents. Viewing these files requires Adobe Acrobat Reader, which can be downloaded at <http://www.adobe.com>.

1. Access the Oracle Help Center site at <http://docs.oracle.com>.
2. Click `Industries`.
3. Under the Oracle Communications subheading, click the `Oracle Communications documentation link`.

The Communications Documentation page appears. Most products covered by these documentation sets will appear under the headings "Network Session Delivery and Control Infrastructure" or "Platforms."

4. Click on your Product and then the Release Number.
A list of the entire documentation set for the selected product and release appears.
5. To download a file to your location, right-click the `PDF link`, select `Save target as` (or similar command based on your browser), and save to a local folder.

2

LSMS Overview

This chapter provides an overview of **LSMS** system architecture, proactive termination and re-establishment of **LSMS** connectivity, hardware and software design features that provide high availability of the **LSMS**, and third-party and Oracle software components used by the **LSMS**.

2.1 Introduction

The **LSMS** is a secure and reliable **Local Number Portability (LNP)** system that enables customers to administer their **LNP** data in a central place. The **LSMS** provides the following functions:

- Receives **LNP** data from Number Portability Administration Centers (**NPACs**)
- Enables customers to enter locally provisioned data such as Override **Global Title Translation (OGTT)** data
- Forwards all **NPAC** and locally provisioned data to up to eight **EAGLE** systems

For more information about the **LNP** functions provided by the **LSMS**, refer to *Database Administrator's Guide* and *LNP Database Synchronization User's Guide*.

This chapter provides an overview of:

- **LSMS** system architecture
- Proactive termination and re-establishment of **LSMS** connectivity
- Hardware and software design features that provide high availability of the **LSMS**
- Third-party and Oracle software components used by the **LSMS**

For additional information about the hardware, refer to *Application B Card Hardware and Installation Guide*.

2.2 LSMS Connectivity

The main function of the **LSMS** is to provision **LNP** data through the ELAP to the EAGLE. To perform this task, the **LSMS** maintains active connections with one or more **NPAC** region servers and one or more EAGLE nodes. While it is the goal of the **LSMS** to maintain active connections to each **NPAC** server and EAGLE node as nearly full-time as possible, the more important goal is to reliably forward the data from the **NPAC** to the EAGLE as quickly as possible. To that end, a number of protective problem detection and recovery mechanisms are built into the **LSMS** design. Several of these protections actually allow for the termination of application connectivity in order to gracefully restore full connectivity and guarantee total recovery of data.

The performance of the **LSMS** is based on network connectivity that meets a Quality of Service expectation. The expectations by Oracle for network Quality of Service are as follows:

- Network RTT latency of $\leq 70\text{ms}$ and network loss due to network error $\leq 0.1\%$
- OR
- Network RTT latency of $\leq 120\text{ms}$ and network loss due to network error $\leq 0.01\%$

In the following situations, the **LSMS** proactively terminates and re-establishes application connectivity with the **NPAC** and **EAGLE** nodes:

- If the **LSMS** detects network level connectivity failures with either the **NPAC** or **EAGLE**, the respective **LSMS** processes terminate the socket level connection and then reconnect. This disconnect and reconnect occurs in a matter of seconds. Built in resynchronization mechanisms ensure data recovery. The data transmission is delayed by the time required to disconnect and reconnect, but the execution of the recovery procedures prevents data loss.
- If the **LSMS** detects critical internal errors that would cause system outages, the **LSMS** processes are designed to terminate and allow the **LSMS** `sentry` process to restart them. This is only done for significant internal errors that jeopardize internal **LSMS** communications. Once the `sentry` process restarts the **LSMS** processes, resynchronization provides full data recovery.

2.3 LSMS Hardware Overview

Table 2-1 provides an overview of **LSMS** hardware.

Table 2-1 LSMS Hardware Components

Qty	Hardware Item	For more detail, see:
2	E5-APP-B-02 cards (P/N 870-3096-02), one for each LSMS server; each card includes the following components: • Dual Core 2.66 Gigahertz (GHz) 64-bit processor • Active/Trial BIOS architecture • 1333 Megahertz (MHz) processor front side bus speed • 8 Gigabyte (GB) DDR2 DRAM • Light Emitting Diode (LED) status display • Hardware monitors that read and report: – Supply and core voltages – Fan alarm inputs – Ambient and processor temperatures • Two drive modules (Field-replaceable units (FRUs)) • Four serial interfaces • One USB port • Fan alarm • Four 1 Gigabit (Gb) Ethernet ports LSMS runs on E5-APP-B cards with Oracle Communications Tekelec Platform (TPD) 7 (64 bit).	<i>Application B Card Hardware and Installation Guide</i>
1	E5-APP-B-02 card (P/N 870-3096-02) for Oracle Communications LSMS Network Attached Storage (NAS) NAS runs on an E5-APP-B card with TPD 7 (64 bit).	NAS Overview

Table 2-2 LSMS Hardware Components

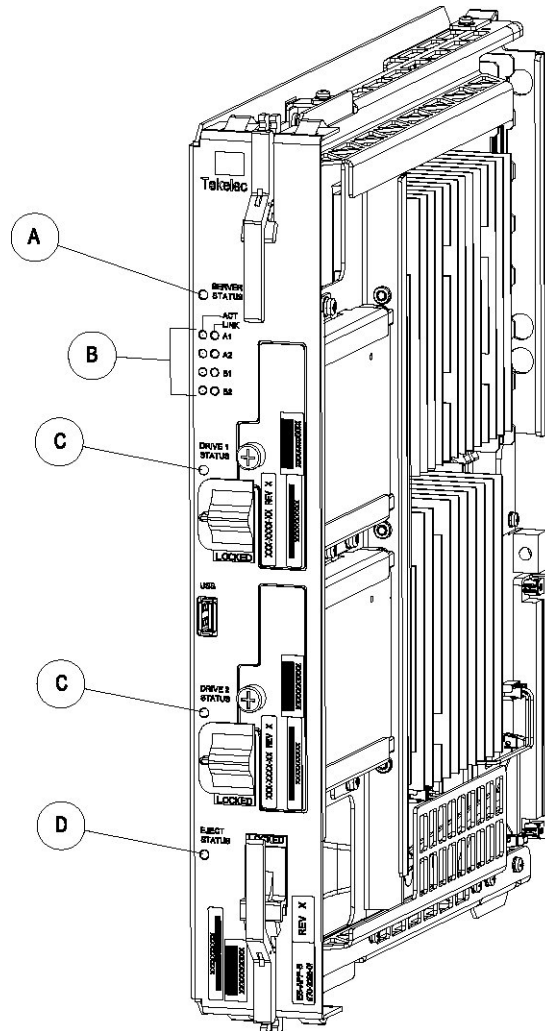
Qty	Hardware Item	For more detail, see:	To replace, see:
2	Tekelec 1100 AS main unit; each unit has the following cards added during manufacturing: • One quad-port gigabit Ethernet Peripheral Component Interconnect (PCI) cards • Two dual-port gigabit Ethernet PCI cards • One Out-of-Band-Management (OOBM) PCI card that contains: – One serial port – One modem interface – One Ethernet port – One interface for alarm relays Each Tekelec 1100 AS main unit has 8 gigabytes of Random Access Memory (RAM) installed and available.	<i>Tekelec 1100 Application Server Hardware Manual</i>	<i>Tekelec 1100 Application Server Hardware Manual</i>
1	Network Attached Storage (NAS)		Contact the Tekelec Customer Care Center.
1	Breaker panel (for DC version only)		<i>Tekelec 1100 Application Server Hardware Manual</i>
2	Power Distribution Units (for AC version only)	<i>Tekelec 1100 Application Server Hardware Manual</i>	<i>Tekelec 1100 Application Server Hardware Manual</i>

E5-APP-B Card LEDs

This section describes the LEDs found on the front face of the E5-APP-B card.

[Figure 2-1](#) shows the E5-APP-B card LEDs on the front panel

Figure 2-1 E5-APP-B Card LEDs



The following light-emitting diode (**LED**) status indicators can be found on the E5-APP-B card:

- One Server Status indicator (A)
- Four E-Net link and Active LED status indicators (B)
- Two drive module status indicators (C)
- One Card Eject status indicator (D)

Table 2-3 E5-APP-B LED Table

LED Name	HW/SW Controlled	Description
Server Status	SW	Solid Red - Server is halted Flashing Red - Server is booting Solid Amber - TKLC configuration beginning Solid Green - TPD loaded/operational state Flashing Green - Server is shutting down

Table 2-3 (Cont.) E5-APP-B LED Table

LED Name	HW/SW Controlled	Description
Drive 1 Status	SW/HW	HW: Flashing Green - Drive activity SW: Flashing Red - Impending drive removal SW: Steady red - Drive ready for removal
Drive 2 Status	SW/HW	HW: Flashing Green - Drive activity SW: Flashing Red - Impending drive removal SW: Steady red - Drive ready for removal
Eject Status	SW	Red - Card ready for extraction Flashing Red - Card preparing for extraction Off - Card is not ready for extraction
Act LED A1	HW	Flashing Green - Link Activity
Act LED A2	HW	Flashing Green - Link Activity
Act LED B1	HW	Flashing Green - Link Activity
Act LED B2	HW	Flashing Green - Link Activity
Link LED A1	HW	Green - 10/100 Link Speed Amber - 1000 Link Speed
Link LED A2	HW	Green - 10/100 Link Speed Amber - 1000 Link Speed
Link LED B1	HW	Green - 10/100 Link Speed Amber - 1000 Link Speed
Link LED B2	HW	Green - 10/100 Link Speed Amber - 1000 Link Speed

NAS Overview

LSMS uses NAS on E5-APP-B for network backup of the system logs, application logs, and databases.

- **Hardware Modifications**
The E5-APP-B NAS uses a two-drive RAID configuration to save the LSMS logs and database. The E5-APP-B NAS uses the TPD 7 OS.
- **Keys Exchange**
The key exchange feature provided by TPD is used to exchange keys between LSMS and NAS. This feature facilitates user access to NAS from LSMS and to LSMS from NAS without providing a user ID and password.
- **Backup**
Both manual and automatic backup are supported. The LSMS interface is used to initiate the manual backup. The automatic backup is scheduled at 23:55 and cannot be rescheduled. A maximum of 4 backups are retained on NAS.
- **Class Type for Storage Data**
The class type of data must be known before storing the data. The class type can be defined specific to the server being backed up, or it can be files/data to be backed up on different servers based on the state of the system. For example, 'database' can be used to back up the database regardless of which server is performing the back up. The class types available are:
 - logs

- DB
- lsmspri
- lsmssec
- logs_lsmspri
- logs_lsmssec
- Restore

You have the option to restore the backups stored on NAS to LSMS. The restore operation is performed on the LSMS server.
- Alarms

The NAS sends SNMP traps to LSMS, which in turn raises an alarm on LSMS. Multiple alarms can be raised simultaneously, which are triggered upon failure of a service. The NAS monitors two services:

 - Free space

The free space service monitors the available space on a mounted device (/Volumes), and sends an alert when the free space is less than 5%.
 - RAID

The RAID service monitors RAID set degradation and rebuilds.

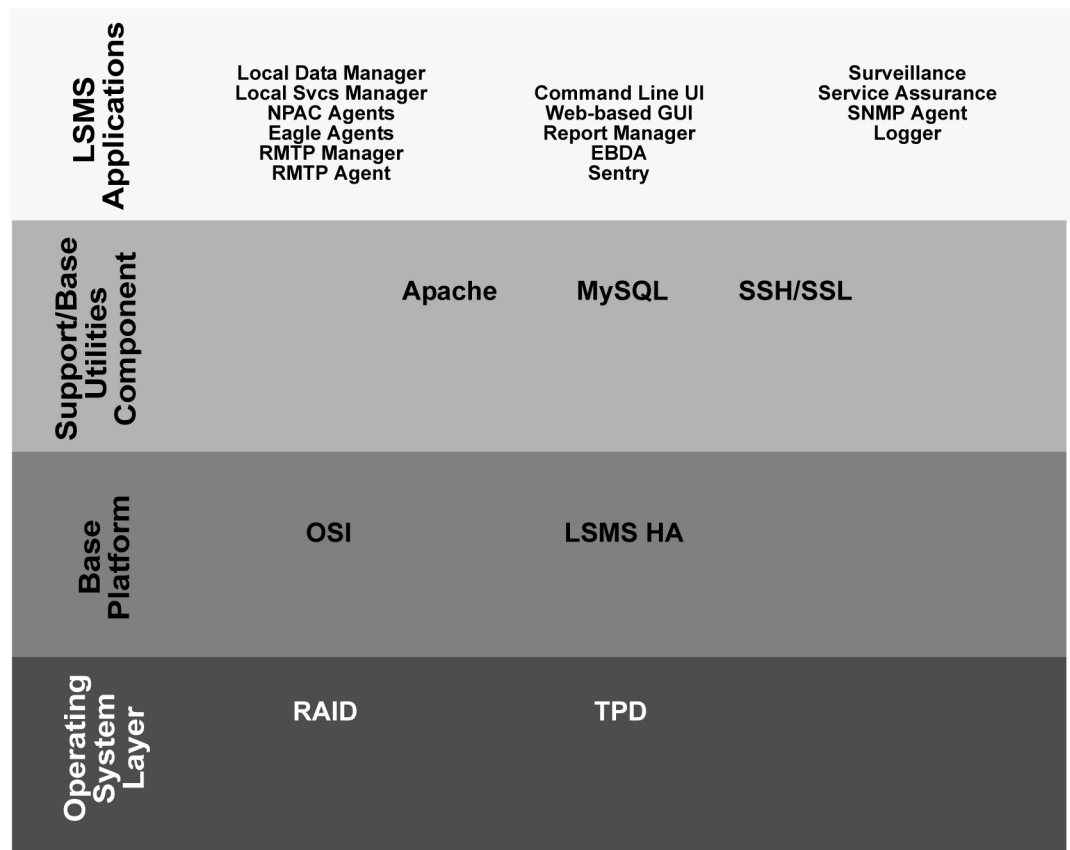
An alarm is cleared when a service makes the state transition from failure to success, if a corresponding alarm was previously sent.
- Login

After configuring NAS with LSMS, you can log into it by using the `ssh backupserver` command or the `minicom nas` command from the LSMS command line interface.

2.4 LSMS Software Overview

Figure 2-2 shows the layered organization of third party and Oracle application software used in the **LSMS** system. For more information about the **LSMS** applications, see [LSMS Applications](#).

Figure 2-2 Software Allocation on the LSMS Platform



Following are descriptions of the various software elements by layer.

2.4.1 Operating System Layer

The following elements appear in the Operating System Layer.

Oracle Communications Tekelec Platform (TPD)

TPD is the operating system used for LSMS on E5-APP-B. The **TPD** software is installed on one internal disk drive and mirrored to a second internal disk for each server.

Redundant Array on Inexpensive Disks (RAID)

The **TPD** uses Linux **RAID** for monitoring disks and recovery from disk problems. **RAID** provides the following benefits:

- Redundancy
- Recoverability from hard-disk crashes

2.4.2 Base Platform Software

Following are the elements of the base platform software.

OSI Stack

This package implements the **OSI** protocol to allow communications between the **LSMS** and the **NPACs**.

LSMS HA

LSMS High Availability (HA) is software for a two-node cluster that provides automated switchover from an active server to a standby server when a server or monitored application experiences a failure. In the **LSMS**, the two servers are peers: either server can act as the active server (although only one server at a time can be the active server). When either automatic or manual switchover causes the standby server to become the active server, it can continue to be the active server until another switchover is needed.



Note:

After switchover, the state of the previously active server is **UNINITIALIZED "INHIBITED"**. As soon as possible, you need to perform the procedure described in [Starting a Server](#) to return the state of that server to **STANDBY** so that it is available when switchover is needed again.

2.4.3 Support/Base Utilities Components

The following elements make up the Support/Base software utilities.

Apache

The Apache process (*httpd*) is a Web server. When the optional **IP** User Interface feature is enabled, the Apache process serves the **GUI** based on Java™ 1.7 technology to client browsers.

MySQL

The MySQL 5.6.31 database was selected for the **LNP** database to store all the **LNP** and service provider data. This database consists of a runtime application programming interface (**API**) and data files. The data files are organized as follows:

- One database that stores locally provisioned data
- One database for each supported **NPAC** region
- A resynchronization database that is used for automatic resynchronizations with network elements; this database can store up to one million data objects

Whenever the two **LSMS** servers are in active/standby mode, all databases are replicated between the two servers, with the active server acting as the master and the standby server acting as the slave.

SSH/SSL

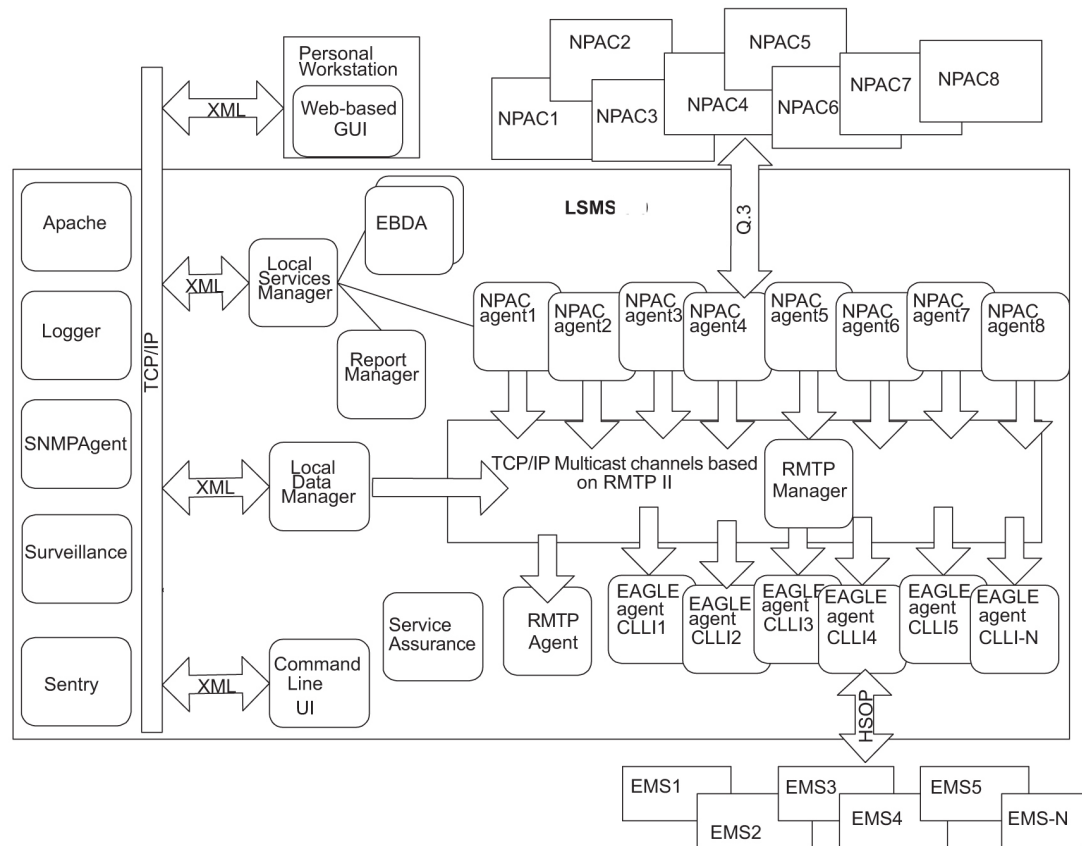
SSH/SSL is a robust, commercial-grade, and full-featured toolkit that implements the security and network encryption.

SSH/SSL provides secure data transmission through encryption keys. Encryption is required for the connection between the **NPAC** and the **LSMS**. The **LSMS** has a key for each **NPAC** that it services. For more information about keys, refer to the *Configuration Guide*.

2.4.4 LSMS Applications

The **LSMS** applications work together as shown below.

Figure 2-3 LSMS Applications



The **LSMS** applications provide the following functions:

Local Services Manager

The Local Services Manager (*lsman*) is responsible for providing an interface between the Local **GUI** and the web-based **GUIs** and other **LSMS** processes. It acts as a gateway to the **GUIs** for processes (**EBDA**, Report Manager, and **NPAC** agents) that do not have direct access to the **GUI**, using Extensible Markup Language (**XML**) messages to communicate.

The Local Services Manager also manages how many users can be running simultaneously. The maximum number of users allowed on the **LSMS** system is eight. A user is defined as a **GUI** session.

- A local **GUI**
- A web-based **GUI**
- A running *lsmsclaa* application instance. An *lsmsclaa* application instance provides a command-line interface that can be used by a script or by entering commands on a keyboard. For more information, see [LSMS Applications](#) and [Overview of LSMS Application Commands Entered at the Command-Line Prompt](#).

The Support for Additional Users optional feature enables you to have a maximum of 25 simultaneous users.

If you attempt to exceed the maximum allowable number of **GUI** sessions, an error message displays. For example, if you do not have the optional Support for Additional Users feature enabled and you start **LSMS GUI** sessions on eight different terminals and then attempted to start a ninth **GUI** session on another terminal, the following error message displays stating that the maximum number of users had been reached:

```
Maximum number of users reached.
```

Local Data Manager

The Local Data Manager (`supman`) is responsible for:

- Provisioning of **LSMS** configuration information and local data
- Communicating with the GUIs using **XML** messages
- Broadcasts all locally provisioned **LNP** data updates using a Reliable Multicast Transport Protocol (**RMTP II**) multicast mechanism on a single channel
- Updating the resynchronization database with locally provisioned data to facilitate automatic resynchronization with Element Management Systems (EMSs) at the supported network elements

NPAC Agents

The **NPAC** Agent application (`npacagent`) is responsible for:

- Connecting with a single **NPAC** system using the Q.3 protocol and providing all functions required by published **NPAC** standards
- Broadcasting all its updates using the **RMTP II** multicast mechanism over one broadcast channel
- Communicating with the GUIs through the Local Services Manager

One instance of the `npacagent` process exists for each enabled **NPAC** region.

EAGLE Agents

The EAGLE Agent application (`eagleagent`) is responsible for:

- Subscribing to the broadcast channels to receive all **NPAC** and local data updates
- Connecting with a single EAGLE node using the High Speed Operations Protocol (**HSOP**) and forwarding **LNP** updates to the **EAGLE**
- Filtering **LNP** data based on the provisioned filter information before forwarding it to the EAGLE (for more information, refer to the *Database Administrator's Guide*)
- Performing automatic resynchronization with an EAGLE node upon connection establishment (for more information, refer to the *LNP Database Synchronization User's Guide*)

One instance of the `eagleagent` process exists for each supported EAGLE node.

RMTPManager

The **RMTPManager** (`rmtpmgr`) is responsible for facilitating the reliable multicast mechanism that allows **LNP** data updates to reach every EAGLE agent. It acts as a top node in an **RMTP**

broadcast tree. A maximum of 9 broadcast channels exists (up to 8 channels for **NPAC** agents and 1 for the Local Data Manager).

RMTPAgent

The **RMTPAgent** (`rmtpagent`) is responsible for keeping the broadcast mechanism flowing even when no EAGLE agents are running. The **RMTPAgent** subscribes to all (up to 9) broadcast channels.

Local GUI

The Local **GUI** application is responsible for providing a graphical user interface to allow operation of the **LSMS** by users who are logged into the **LSMS** administration console or a network-connected workstation through which they have made a telnet connection to the **LSMS**. Multiple instances of the Local **GUI** can exist.

Web-Based GUI

The Web-based **GUI** application runs outside of the **LSMS** system on a client platform. It provides an **IP**-based **GUI** to operate the **LSMS** and has the same appearance and functionality as the local **GUI**. Multiple instances of the Web-based **GUI** can exist.

Report Manager

The Report Manager (`reportman`) is responsible for producing reports on demand. It can produce up to 10 reports simultaneously.

EBDA

The Enhanced Bulk Download and Audit process (`ebda`) is responsible for providing the capability of performing audits, reconciles, bulk loads and user-initiated resynchronizations of an EAGLE **LNP** database. Multiple instances of the `ebda` process can exist for different EAGLE nodes.

Sentry

The Sentry process (`sentryd`) monitors other software processes and attempts to restart them automatically in certain failure conditions. For more information about the Sentry application, see [“Automatically Restarting Software Processes”](#).

Surveillance

The **LSMS** Surveillance process (`survMon`) continually surveys the **LSMS** hardware and software and sends surveillance notifications to the server’s serial port. Users who want to display surveillance notifications on an administration console can connect Serial Port 3 to the administration console (see [Configuring a Customer-Provided Administration Console](#)).

Surveillance is also responsible for monitoring and restarting the `sentryd` and Service Assurance processes. For more information, see [“Understanding the Surveillance Feature”](#).

Service Assurance

The Service Assurance feature allows an external system to access subscription version data from the **LNP** databases in the **LSMS**. For more information, see [“Understanding the Service Assurance Feature”](#).

SNMPAgent

The **SNMPAgent** (*lsmsSNMPAgent*) is a process running on the **LSMS** platform that supports only the SNMPv1 and SNMPv3 trap operation. This process receives (through **UDP** Linux sockets) **LSMS** notification events from other **LSMS** processes and formats these events into trap requests. For more information, see [“Understanding the SNMP Agent Process”](#).

Logger

The Logger process (*lsmslogd*) is responsible for:

- Receiving log entries from application processes
- Storing them in appropriate log files
- Starting new log files every midnight

2.5 Overview of High Availability

To provide a high likelihood of the **LSMS** being able to function (high availability), the **LSMS** is implemented with hardware redundancies and with software that monitors hardware status and allows the **LSMS** functions to be run on either server (but not both at once).

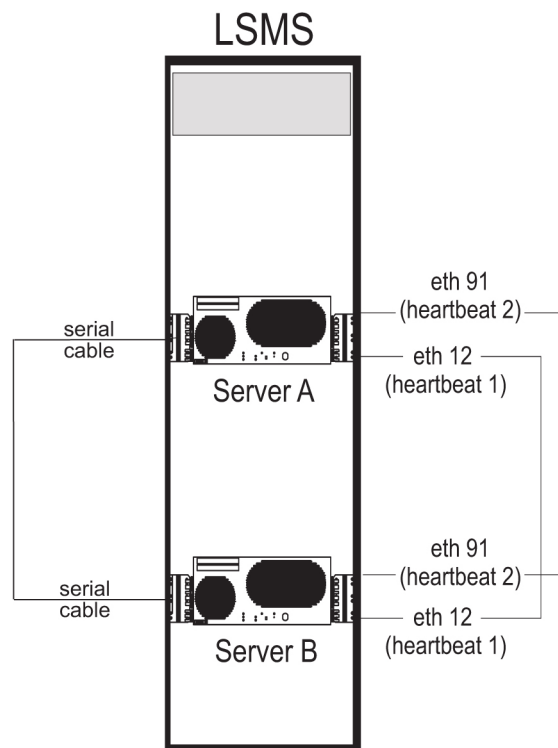
2.5.1 Hardware Redundancies

Each server contains two internal mirrored disks.

The **LSMS** is implemented with a pair of redundant servers and the following redundant heartbeat connections between them:

- A bonded pair of Ethernet connections for heartbeats
- A serial cable connection for heartbeats

Figure 2-4 LSMS Servers Connected with Heartbeat Links



Redundant Servers

Two servers, one active and one standby, provide redundancy in processing. If the active server fails, the **LSMS** can run on the standby server.

Changing from one server to another is called *switchover*. The server on which the **LSMS** is running at a given time is called the *active server* and the other server is called the *standby server*.

For some types of failure on the active server, the **LSMS** automatically attempts to switch over. You can also manually switch over at any time. For more information about switching over, see the following:

- [“Understanding Switchover”](#)
- [“Understanding Automatic Switchover”](#)
- [Manually Switching Over from the Active Server to the Standby Server](#)

Redundant Data

The **LSMS** is designed with the following data redundancies:

- Each server contains mirrored disks. If both sides of the mirrors fail on the active server, the **LSMS** automatically attempts to switch over to the standby server. For more information, see [Automatic Switchover Due to Hardware-Related Failure](#).
- The database on the active server is replicated by the standby server.

Redundant Heartbeats

The servers use heartbeats to monitor each other. The servers are connected by a pair of redundant Ethernet connections and a serial connection. As long as each server is functioning,

it sends its *heartbeat* to the other server over these connections. These two Ethernet connections are implemented on separate Ethernet cards, so that the failure of one Ethernet card does not prevent heartbeats from being sent.

The heartbeats are monitored by the Surveillance feature. If a heartbeat cannot be detected, one of the following notifications is posted:

```
LSMS4015|14:58 Jun 22, 2000|xxxxxxx|Notify:Sys Admin - Heartbeat 1 failure
```

```
LSMS4016|14:58 Jun 22, 2000|xxxxxxx|Notify:Sys Admin - Heartbeat 2 failure
```

2.5.2 Software Availability Design

The following **LSMS** software design features enhance the availability of the **LSMS**:

- The **LSMS HA** utility monitors the states of both servers, detects failure conditions, and automatically switches over for certain failures on the active server. For more information, see [Managing Server States](#)
- The Surveillance feature monitors critical processes and interfaces and posts notifications. For more information, see [“Understanding the Surveillance Feature”](#).
- The `sentryd` feature detects certain application failures and automatically attempts to restart the failed applications. Full functionality of this feature requires that the Surveillance feature be enabled. For more information about `sentryd`, see [Restarting Software Processes](#)
- The **LSMS** provides the following automatic attempts to reassociate and resynchronize after outages between **NPACs** and the **LSMS** or between the **LSMS** and network elements (when automatic recovery is not possible, notifications are posted, and operator-initiated recovery procedures are documented as indicated):
 - Automatic reassociation with an **NPAC** after some association outages (for operator-initiated recovery procedures, refer to the *Configuration Guide*)
 - Automatic resynchronization of **NPAC** and **LSMS** data after reassociation (when automatic resynchronization is not possible, notifications are posted, and operator-initiated recovery procedures are documented in [“Resynchronizing After an Outage Between an NPAC and the LSMS”](#))
 - Automatic resynchronization of the **LSMS** and network element data after outage (when automatic recovery is not possible, notifications are posted, and operator-initiated recovery procedures are documented in the *LNP Database Synchronization User's Guide*)

2.6 Enhancing High Availability with a Shadow LSMS

To further enhance the availability of **LSMS** functions, you can choose to implement a shadow **LSMS**, where a shadow **LSMS** is an entire **LSMS** (with its own service provider **ID**) located in a separate geographical location from the main **LSMS**. Having a shadow **LSMS** available reduces the time needed to restore service in situations of severe error or disaster, such as fire or flood. The following types of shadow strategies are available:

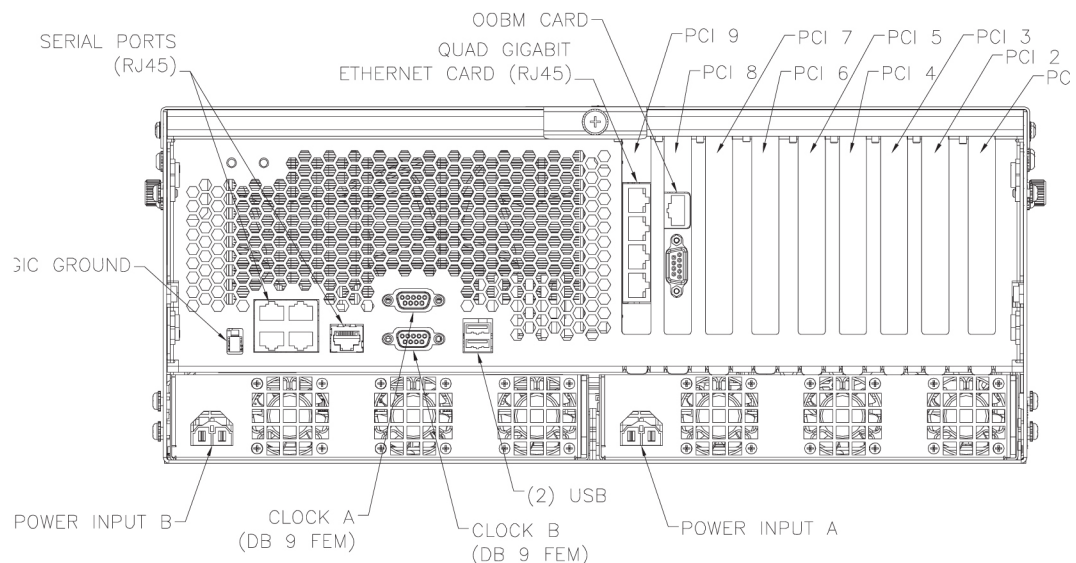
- Active shadow—a shadow **LSMS** that is connected to **NPACs**
- Inactive shadow—a shadow **LSMS** exists but is not connected to **NPACs**

For more information about a shadow **LSMS**, and recovery procedures for each strategy, see [Recovering from Site Failures](#). This chapter also describes the procedure for restoring a main **LSMS** after a site failure when no shadow is available.

2.7 Understanding the Surveillance Feature

On each server, the **LSMS** Surveillance feature continually surveys the **LSMS** hardware and software and sends surveillance notifications to Serial Port 3 on each server. The Surveillance feature also logs all surveillance notifications in the file `survlog.log` in the `/var/TKLC/lsmc/logs` directory. The Surveillance feature starts when **LSMS** starts.

Figure 2-5 T1100 - Rear View - Showing Serial Ports



The Surveillance feature also monitors network interfaces. For information about configuring the Surveillance feature for this purpose, refer to the *Configuration Guide*.

The Surveillance feature enables remote personnel to monitor the **LSMS** and detect conditions that require immediate action. Some surveillance notifications are sent only when the event occurs; other notifications are sent both when the event first occurs and also every five minutes thereafter until the condition is cleared. Every five minutes, the Surveillance feature also sends a *keep alive* notification to the Surveillance serial port and logs the *keep alive* in the file `survlog.log`.

The following topics are described in this section:

- [Configuring a Customer-Provided Administration Console](#)
- [Controlling the Surveillance Feature](#)
 - [Starting the Surveillance Feature](#)
 - [Stopping the Surveillance Feature](#)
 - [Determining the Surveillance Status](#)
- [Understanding Surveillance Notifications](#)
- [Logging Surveillance Notifications](#)

Configuring a Customer-Provided Administration Console

If customers desire a local administration console for displaying Surveillance notifications, they can attach their own administration console to Serial Port 3 on each of the **LSMS** servers. The following requirements are needed to provide and configure a customer-provided administration console:

- A workstation that can display text
- Two cables that connect to the **RJ-45** interface used by Serial Port 3 on each **LSMS** server
- Configure the connections as:
 - 115200 baud
 - Parity 8E1
- Software running on the workstation that can determine from which cable the Surveillance notification is arriving (the Surveillance notifications do not identify which server is generating them)

2.7.1 Controlling the Surveillance Feature

The Surveillance feature starts on each server when the server starts. The following topics explain how to use **LSMS** commands to start, stop, and check the status of the Surveillance feature.



Note:

These commands affect only the server on which they are entered.

2.7.1.1 Starting the Surveillance Feature

Use the `lsmssurv start` command to start the Surveillance feature on the server that you are logged into.

1. Log in as `root` on either server.
2. Type the following command to start surveillance:

```
lsmssurv start
```

Either of the following messages appears, depending on whether surveillance was already running:

```
LSMS Surveillance feature started  
LSMS Surveillance feature is currently running
```

3. Repeat this procedure for the other server, if desired.

2.7.1.2 Stopping the Surveillance Feature

Use the `lsmssurv stop` command to stop the Surveillance feature on the server that you are logged into.

1. Log in as `root` on either server.

2. Type the following command to stop surveillance:

```
lsmssurv stop
```

Either of the following messages appears, depending on whether surveillance was already stopped:

```
LSMS Surveillance feature stopped  
LSMS Surveillance feature is not currently running
```

3. Repeat this procedure for the other server, if desired.

2.7.1.3 Determining the Surveillance Status

Use the `lsmssurv status` command to check the status of the Surveillance feature. This command allows you to determine if the Surveillance feature is already running or has already been stopped.

1. Log in as `root` on either server.
2. Type the following command to get surveillance status:

```
# lsmssurv status
```

You will receive one of the following messages:

```
LSMS Surveillance feature is currently started  
LSMS Surveillance feature is currently stopped
```

3. Repeat this procedure for the other server, if desired.

2.7.1.4 Returning the Surveillance Feature to Last Valid State

Use the `lsmssurv last` command to return the Surveillance feature to its last valid state. If the Surveillance Monitor should be running but it is not for any reason, then `lsmssurv last` will start it.

1. Log in as `root` on either server.
2. Type the following command:

```
lsmssurv last
```

The following messages appears:

```
LSMS Surveillance feature started
```

3. Repeat this procedure for the other server, if desired.

2.7.2 Understanding Surveillance Notifications

[Introduction](#) provides information about the format of Surveillance notifications and how they correlate to **GUI** notifications and traps. In addition, for each Surveillance notification, ordered by its event number, the appendix provides the following information:

- It output text string

- Explanation of possible cause, beyond the text that fits into the notification text string
- Suggested recovery actions
- Source from which the notification is sent
- Frequency with which the notification appears

Logging Surveillance Notifications

In addition to displaying Surveillance notifications, the Surveillance feature logs all Surveillance notifications in the file `survlog.log` in the `/var/TKLC/lsmc/logs` directory.

If the **LSMS** Surveillance feature becomes unable to properly report conditions, it logs the error information in a file, named `lsmcSurv.log`, in the `/var/TKLC/lsmc/logs` directory on each server's system disk. When the size of `lsmcSurv.log` exceeds 1MB, it is copied to a backup file, named `lsmcSurv.log.bak`, in the same directory. There is only one **LSMS** Surveillance feature backup log file, which limits the amount of log disk space to approximately 2MB.

2.8 Understanding the Service Assurance Feature

The Service Assurance feature allows an external system to access subscription version data from the **LNP** databases in the **LSMS**. This information is useful in verifying correct porting of data, and helps in troubleshooting problems. There is one **LNP** database for each of the **NPACs** associated with the **LSMS**.

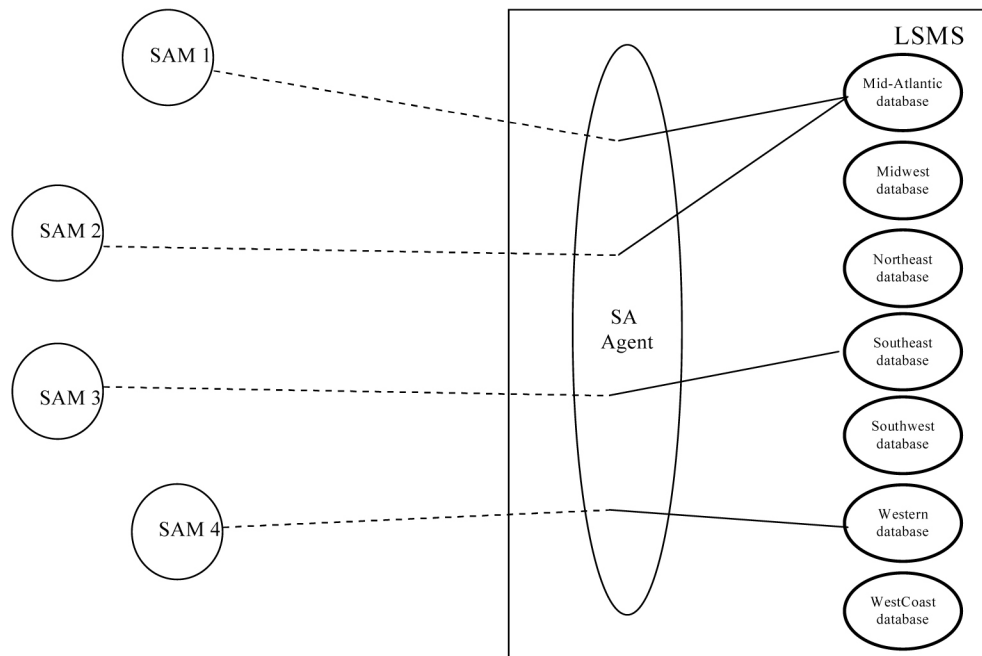
The external system uses Service Assurance Manager (**SAM**) application software to initiate service assurance data requests and associations. Single or multiple **SAMs** may exist on the external computer system. The **SAM** communicates with the **LSMS** through the Service Assurance Agent (**SAA**) application software that resides in the **LSMS**. The **SAM** application software is not Oracle software and is only resident on the external system.

The **SAA** decodes the queries from the **SAM** and then accesses the **LNP** database. The **SAA** forms the subscription version data into a message and that message is sent to the **SAM** making the query.

Service Assurance works in conjunction with the Surveillance feature. The Surveillance feature issues the command to start the Service Assurance agent (part of the Service Assurance feature that is described in this document), and it monitors the status of the Service Assurance agent.

A maximum of eight **SAM/SAA** sessions are allowed at one time.

Figure 2-6 Service Assurance System within a Network



The architecture used to provide the access is a Connection Oriented Manager/Agent using Common Management Information Protocol (**CMIP**). **CMIP** provides an industry standard interface between Manager and Agent applications. This allows you to use standard products and tool kits to develop applications.

Service Assurance Terminology

The following terms are used to describe Service Assurance:

- **Service Assurance Manager (SAM)**: Initiator of service assurance associations and data requests. This is *not* part of the **LSMS** application. A **SAM** application runs on a computer but is not the computer itself. Multiple **SAMs** can run on the same computer, or each **SAM** can run on a different computer.
- **Service Assurance Agent (SAA)**: Software residing on the **LSMS** and considered part of the **LSMS** application. This software consists of one or more Linux processes and one or more Linux scripts.
- **NPAC Database**: This refers to the database stored on the **NPAC**.
- **LNP Database**: This refers to the database that contains subscriptionVersions, Service Provider Network, Service Provider **LRN** and Service Provider **NPA-NXX** objects. This database resides on the **LSMS**. Each **NPAC** has one **LNP Database** on the **LSMS**.
- **Manager/Agent**: This term describes the two peer processes that work together to implement the Service Assurance feature. The Manager is the customer's application, which is used to initiate the association and send the query to the Agent process. The Agent process decodes the query message, then accesses the **LNP Database**. The Agent extracts the data from the database, then builds and sends the reply to the Manager. This feature allows the Manager to send a single subscription **TN** or list of subscription **TNs** to query. The Agent extracts each instance that it can find from the **LNP Database** and returns a response to the Manager.

The architecture is connection oriented to restrict access to the **LNP** databases. This system is assumed to be within the customer's private network, so no encryption security is included. The **CMIP** protocol defines the method for establishing and terminating associations. This application uses the access control and user data space in the association messages to restrict access to the system.

The **SAM** is restricted to querying subscription versions by the subscriptionTN field. Up to four **SAMs** can query the **LSMS** at the same time.

The Service Assurance feature interfaces to the **LSMS** by means of a 10 Mbps Ethernet interface. The Application **WAN** is also used as the interface for the X-terminals connected to the **LSMS**. The network connecting the Service Assurance systems to the **LSMS** is the responsibility of the customer.

Interface Implementation

The **LSMS** Service Assurance interface is implemented over a standard **CMIP/CMISE**-based **OSI** protocol stack (Q.3). **RFC1006** is used for the transport layer.

This interface is limited to the retrieve capabilities of the local **LSMS** database. The object to be retrieved is the subscription Version defined in *NPAC SMS Interoperable Interface Specification*, **NANC** Version 1.5, September 1997.

Allowed Functions on the Interface

The **LSMS** responds to association (bind) requests, release (unbind) requests, aborts, and subscription query (m-get) messages. No other functions are allowed over this interface and will be rejected.

Support of OSI Addresses

The **LSMS** supports four **OSI** address connections for Service Assurance interfaces, which correspond to eight domains.

Each Service Assurance system needs to establish only the associations it requires, without regard to whether the **LSMS** is operating with the primary or secondary server. Upon switchover, the association is momentarily lost. The Service Assurance system tries to reestablish the association. When the active system finishes coming up, it then responds to the Service Assurance system association requests. The Service Assurance system does not know whether the primary or secondary system is running.

Association information is specified by Oracle. This information must be present in the bind request. This data in the association information, such as the system name, is used to verify the source of a bind request. Bind requests with invalid association information are rejected.

Establishment of association between the **LSMS** and the Service Assurance system is initiated by the Service Assurance Manager. This applies to initial association as well as to reestablishing the association after outages (regardless of the cause of the loss of association). When it does not have an association, the Service Assurance system periodically tries to establish the association until a successful response is received from the **LSMS**. The minimum retry interval is one minute.

The **LSMS** provides a response to the bind request to indicate:

- Successful connection
- Access control failure (authority violation - unknown address requesting association)
- **LSMS** data access failure
- Resource failure (maximum number of associations already established)

Number of Associations Per Service Assurance System

The **LSMS** supports one association per Service Assurance system.

If a Service Assurance agent within the **LSMS** is unable to establish a connection with the **LSMS NPAC** database, the association with the Service Assurance system is aborted.

Notification Upon Loss of Association

The **LSMS** provides a notification when the association with any of the Service Assurance Manager is lost or established.

2.9 Understanding the SNMP Agent Process

The optional Remote Monitoring feature provides the capability for the **LSMS** to report certain events and alarms to a remote location, using the industry-standard **Simple Network Management Protocol (SNMP)**. The **LSMS** implements an **SNMP** agent with the **SNMP** agent process running on the **LSMS** platform.

Customers can use this feature to cause the **LSMS** to report events and alarms to another location, which implements an **SNMP** Network Management System (**NMS**). An **NMS** is typically a standalone device, such as a workstation, which serves as an interface through which a human network manager can monitor and control the network. The **NMS** typically has a set of management applications (for example, data analysis and fault recovery applications). The **SNMP** feature must be enabled while configuring the **NMS**.

Overview of SNMP Protocols

An **SNMP** agent, such as that implemented by the **LSMS**, is responsible for **SNMP** managed objects; each managed object represents a data variable. A collection of managed objects is called a management information base (**MIB**). A copy of the **MIB** is maintained both at the **SNMP** agent and also at the **NMS**. The **MIB** can be read with a text editor.

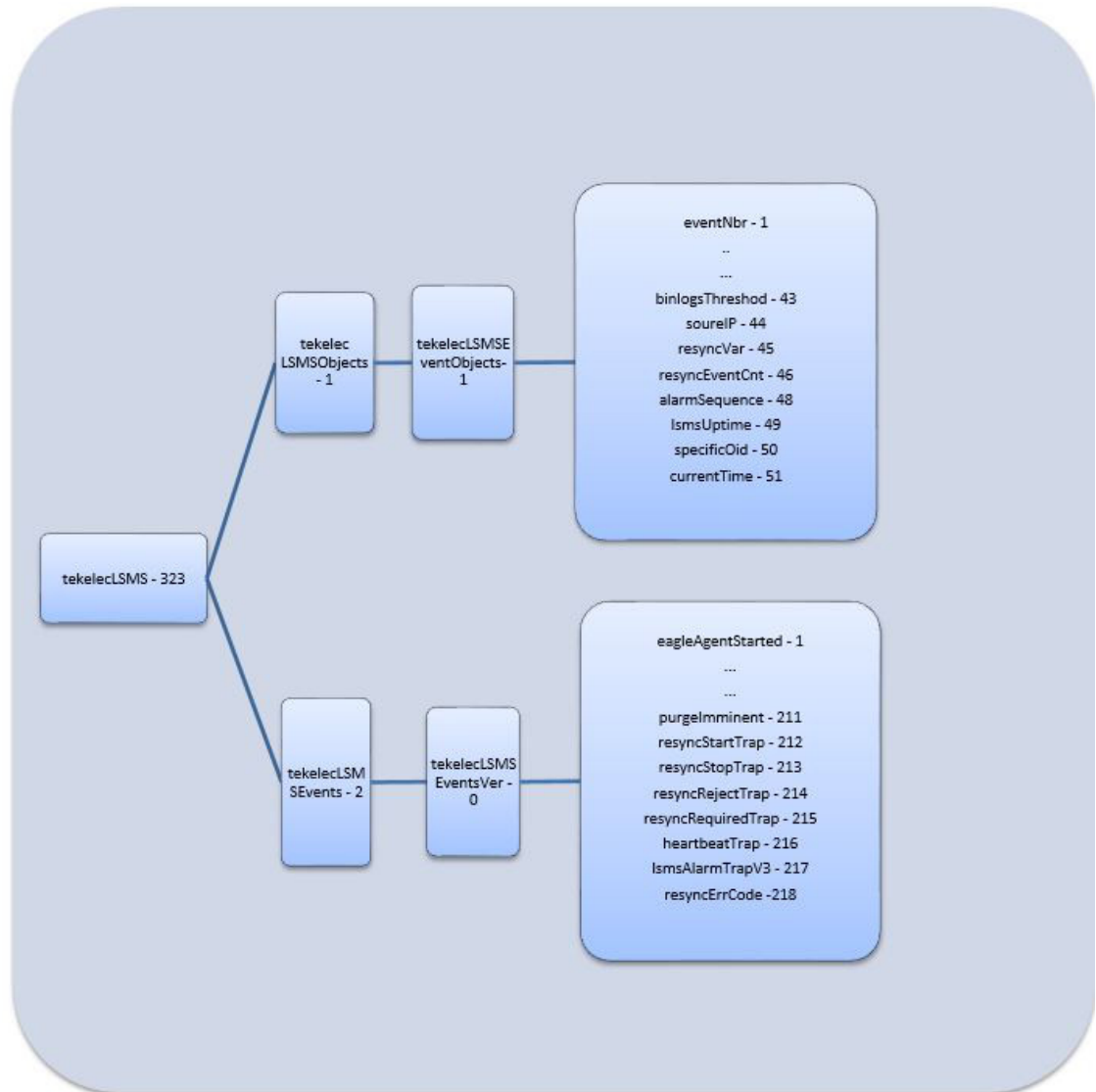
An **SNMP** agent can do the following:

- Respond to requests from the **NMS** for information and/or action. The **SNMP** architecture defines a limited set of management commands and responses. The **NMS** can issue *Get*, *GetNext*, and *Set* messages to retrieve single or multiple object variables or to modify the value of a single variable. The **SNMP** agent sends a response message to complete the *Get*, *GetNext*, or *Set*. This release of the **LSMS** does not support these functions.
- Send event notifications, called *trap* requests, to the **NMS** to identify the occurrence of conditions, such as the failure or restoration of a link interface.

The **SNMP** protocol uses the User Datagram Protocol (**UDP**) transport protocol in a **TCP/IP** network. **UDP** is a connectionless protocol and does not guarantee reliable delivery of data. Therefore, **SNMP** does not use a preestablished connection to send data and does not guarantee reliable delivery of data.

MIB Structure

Figure 2-7 MIB Structure



New Object definition:

```

sourceIP    OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Th" source ip of the device where event was generated."
    ::= { tekelecLSMSEventObjects 44 }

resyncVar    OBJECT-TYPE
    SYNTAX      INTEGER(0..1)
  
```

```

MAX-ACCESS read-write
STATUS current
DESCRIPTION "Th" object is available to be set by the NMS to indicate a
request for alarm resynchronization.
        Object value=0 indicates a request to stop an ongoing
resnchronization and Object value=1 indicates a resynchronization request."
:= { tekelecLSMSEventObjects 45 }

resyncEventCnt      OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS read-only
    TUS      current
    DESCRIPTION "Th" total number of Resync alarms to be sent."
    ::= { tekelecLSMSEventObjects 46 }

alarmSequence      OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
        "Un"que sequence number identifying an SNMP Alarm Trap instance."
    ::= { tekelecLSMSEventObjects 48 }

lsmsUptime      OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
        "Ti"e since LSMS is up."
    ::= { tekelecLSMSEventObjects 49 }

specificOid      OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION "Trap ID."
    ::= { tekelecLSMSEventObjects 50 }

currentTimeOBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION "Date and time string."
    ::= { tekelecLSMSEventObjects 51 }

resyncErrCode      OBJECT-TYPE
    SYNTAX OCTET STRING
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "errorCode = 0, Resynchronization completed successfully.
        errorCode = 1, Resynchronization aborted by NMS.
        errorCode = 2, Resynchronization already in progress for the NMS.
        errorCode = 3, Resynchronization Aborted, Database error
    
```

```

occurred.
        errorCode = 4, Resynchronization not in progress."
 ::= { tekelecLSMSEventsVer 218 }

```

New Trap Definition:

Existing traps defined for SNMP v1 are modified to include the following for the MIB for SNMP v3:

1. sourceIP
2. alarmSequence

New SNMPv3 MIB Traps:

```

tekelecLSMSEventsV3 OBJECT IDENTIFIER ::= { tekelecLSMSEvents 3 }

resyncStartTrap      NOTIFICATION-TYPE
    OBJECTS { lsmsUptime, sourceIP }
    DESCRIPTION "The trap is sent by the LSMS to NMS when the LSMS is about
to start resynchronization"
    ::= {tekelecLSMSEventsV3 212 }

resyncStopTrap       NOTIFICATION-TYPE
    OBJECTS { lsmsUptime, sourceIP, resyncEventCnt, resyncErrCode }
    DESCRIPTION "The trap is sent by the LSMS to NMS when resynchronization
is complete"
    ::= {tekelecLSMSEventsV3 213 }

resyncRejectTrap     NOTIFICATION-TYPE
    OBJECTS { lsmsUptime, sourceIP, resyncErrCode }
    DESCRIPTION "The trap is sent by the LSMS to NMS when a resynchronization
request is rejected by LSMS "
    ::= {tekelecLSMSEventsV3 214 }

resyncRequiredTrap   NOTIFICATION-TYPE
    OBJECTS { lsmsUptime, sourceIP }
    DESCRIPTION "The trap is sent by the LSMS to NMS when the LSMS is
rebooted or LSMS is started"
    ::= {tekelecLSMSEventsV3 215 }

heartBeatTrap        NOTIFICATION-TYPE
    OBJECTS { lsmsUptime, sourceIP }
    DESCRIPTION "The trap is sent by the LSMS to NMS periodically to indicate
that the LSMS is up"
    ::= {tekelecLSMSEventsV3 216 }

lsmsAlarmTrapV3      NOTIFICATION-TYPE
    OBJECTS { currentTime,specificOid ,sourceIP,
alarmSequence,specificAlarm}
    STATUS current
    DESCRIPTION "The trap will indicate that the following information is for
a particular event"
    ::= {tekelecLSMSEventsVer 217 }

```

The MIB "choice fields" is added to accept a different number of arguments at runtime:

```
SPECIFIC_ALARM ::=
    CHOICE {
        OBJECTID-VALUE
        TEKELECLSMSEVENTSVER
    }
```

Varbinds "sourceIP" and "alarmSequence" are added as a part of SNMPv3 and will be fixed varbinds to keep SNMPv1 backward compatible. SNMPv1 information will be passed as a part of "choice field."

A "currentTime" field conveys information about time when an alarm is triggered.

Current definition for SNMPv3 Trap:

```
LSMSALARMTRAPV3    NOTIFICATION-TYPE
    OBJECTS { CURRENTTIME, SPECIFICOID, SOURCEIP,
    ALARMSEQUENCE, SPECIFIC_ALARM }
    STATUS CURRENT
    DESCRIPTION "THE TRAP WILL INDICATE THAT THE FOLLOWING INFORMATION IS FOR
    A PARTICULAR EVENT"
    ::= { TEKELECLSMSEVENTSVER 217 }
```

Description of different varbinds of SNMPv3 Trap:

Table 2-4 Description of Different Varbinds of SNMPv3 Trap

MIB OBJECTS	OID	Description
currentTime	1.3.6.1.4.1.323.5.3.4.1.1.51.0	Time when alarm is generated.
specificOid	1.3.6.1.4.1.323.5.3.4.1.1.50.0	Oid which uniquely identifies a SNMPv3 alarm
sourceIP	1.3.6.1.4.1.323.5.3.4.1.1.44.0	IP address of active alarm
alarmSequence	1.3.6.1.4.1.323.5.3.4.1.1.48.0	Sequence number of triggered alarm
specificAlarm	List of OID for different varbinds	List of oid for different varbind and values

Sample SNMPv3 trap for alarm 4021:

```
DISMAN-EVENT-MIB::SYSUPTIMEINSTANCE = TIMETICKS: (44365220) 5 DAYS, 3:14:12.20
SNMPV2-MIB::SNMPTRAPOID.0 = OID: SNMPV2-SMI::ENTERPRISES.323.5.3.4.2.0.217
SNMPV2-SMI::ENTERPRISES.323.5.3.4.1.1.51.0 = STRING: "02/01/10 20:31:31"
SNMPV2-S
MI::ENTERPRISES.323.5.3.4.1.1.50 .0= STRING: "1.3.6.1.4.1.323.5.3.4.2.0.40"
SNMPV2-SMI::ENTERPRISES.323.5.3.4.1.1.44.0 = STRING: "192.168.59.30"
SNMPV2-S
MI::ENTERPRISES.323.5.3.4.1.1.48.0 = GAUGE32: 44 SNMPV2-
SMI::ENTERPRISES.323.5.3.
4.1.1.1.0 = INTEGER: 4021 SNMPV2-SMI::ENTERPRISES.323.5.3.4.1.1.17.0 =
STR
ING: "LMGRD"
MIB FOR ALARM 4021
=====
```

```
LSMSAPPSNOTRUNNING NOTIFICATION-TYPE
    OBJECTS      { EVENTNBR, PROCESSNAME, SOURCEIP, ALARMSEQUENCE }
    STATUS       CURRENT
    DESCRIPTION
        "THIS NOTIFICATION INDICATES THAT A SPECIFIC LSMS APPLICATION
        OR SYSTEM DAEMON IS NOT RUNNING."
    ::= { TEKELECLSMSEVENTSVER 40 }
```

Decoding SNMPv3 Trap for alarm 4021:

Table 2-5 Decode SNMPv3 Trap for Alarm 4021

OID	MIB OBJECT	Value
1.3.6.1.4.1.323. 5.3.4.2.0.217	IsmsAlarmTrapV3 (Indicating SNMPv3 Alarm)	NO value
1.3.6.1.4.1.323.5.3.4.1.1.51.0	currentTime	02/01/10 20:31:31
1.3.6.1.4.1.323.5.3.4.1.1.50.0	specificOid (unique oid of Isms alarm)	1.3.6.1.4.1.323.5.3.4.2.0.40
1.3.6.1.4.1.323.5.3.4.1.1.44.0	sourceIP	192.168.59.30
1.3.6.1.4.1.323.5.3.4.1.1.48.0	alarmSequence	44
1.3.6.1.4.1.323.5.3.4.1.1.1.0, 1.3.6.1.4.1.323. 5.3.4.1.1.17.0	eventNbr,processName(variable varbinds)	4021,lmgrd



Note:

There is no SNMPv3 trap for event numbers 8102 to 8105 and 8110 to 8118, as there is no trap definition for these events. These events will exhibit SNMPv1 behavior.

TKLC-LSMS-MIB

```
TEKELEC-LSMS-TRAP-MIB DEFINITIONS ::= BEGIN-- Copyright 2015 Oracle
Corporation IMPORTS      tekelecLSMS      FROM TEKELEC-TOPLEVEL-REG
NOTIFICATION-TYPE,      OBJECT-TYPE,      IPAddress,      TimeTicks,
Unsigned32,      CHOICE      FROM SNMPv2-SMI;-- LSMS Object group sub-tree
tekelecLSMSObjects OBJECT IDENTIFIER ::= { tekelecLSMS 1 }-- LSMS Product
Events sub-tree tekelecLSMSEvents OBJECT IDENTIFIER ::= { tekelecLSMS 2 }--
LSMS Events Object group sub-tree tekelecLSMSEventObjects OBJECT
IDENTIFIER ::= { tekelecLSMSObjects 1 }-- LSMS SNMP Events compatible for
both version1 and version3tekelecLSMSEventsVer OBJECT IDENTIFIER ::=
{ tekelecLSMSEvents 0 }specificAlarm ::= CHOICE{      objectID-
value      tekelecLSMSEventsVer      }---- OBJECTS DEFINITIONS--
eventNbr OBJECT-TYPE      SYNTAX  INTEGER (1..2147483647)      MAX-ACCESS  read-
only      STATUS  current      DESCRIPTION      "Tekelec specific unique
identifier for the notification      error number. The value can be any
positive integer      value except 0"      ::= { tekelecLSMSEventObjects
1 }      -- Varying in length from 0 to 65535 for SNMPv1 OCTET
STRINGnPACRegion OBJECT-TYPE      SYNTAX  OCTET STRING      MAX-ACCESS  read-
only      STATUS  current      DESCRIPTION      "a string indicating the name
of the NPAC Region."      ::= { tekelecLSMSEventObjects 2 }      --
Varying in length from 0 to 65535 for SNMPv1 OCTET STRINGneCLLI OBJECT-
TYPE      SYNTAX  OCTET STRING      MAX-ACCESS  read-only      STATUS  current
DESCRIPTION      "a string indicating the network element CLI."      ::=
```

```

{ tekelecLSMSEventObjects 3 } npacId OBJECT-TYPE SYNTAX OCTET
STRING MAX-ACCESS read-only STATUS current DESCRIPTION "a
string that identifies the specific LSMS NPAC association. Valid
values are: primary,secondary." ::= { tekelecLSMSEventObjects 4 }
npacRegionId OBJECT-TYPE SYNTAX OCTET STRING MAX-ACCESS read-
only STATUS current DESCRIPTION "A 2 character string 2 that
uniquely identifies each NPAC region. Valid value
are: MW - Midwest MA - Mid-Atlantic NE -
Northeast SE - Southeast SW - Southwest WE - West
Regional WC - West Coast CA - Canada " ::=
{ tekelecLSMSEventObjects 5 } oldNPA OBJECT-TYPE
SYNTAX OCTET STRING MAX-ACCESS read-only STATUS current
DESCRIPTION "The old number planning area (area code) value." ::=
{ tekelecLSMSEventObjects 6 } newNPA OBJECT-TYPE SYNTAX
OCTET STRING MAX-ACCESS read-only STATUS current
DESCRIPTION "The new number planning area (area code) value." ::=
{ tekelecLSMSEventObjects 7 } nXX OBJECT-TYPE SYNTAX OCTET
STRING MAX-ACCESS read-only STATUS current DESCRIPTION
"The exchange code value (NXX)." ::= { tekelecLSMSEventObjects 8 }
npacRecoveryRetryInterval OBJECT-TYPE SYNTAX OCTET STRING MAX-
ACCESS read-only STATUS current DESCRIPTION "Positive integer
value indicating the NPAC recovery retry interval." ::=
{ tekelecLSMSEventObjects 9 } retryTimes OBJECT-TYPE SYNTAX OCTET
STRING MAX-ACCESS read-only STATUS current DESCRIPTION
"Integer values indicating the number of retries." ::=
{ tekelecLSMSEventObjects 10 } fromPeriod OBJECT-TYPE SYNTAX OCTET
STRING MAX-ACCESS read-only STATUS current DESCRIPTION
"Beginning time specification YYYYMMDDhhmmss " ::=
{ tekelecLSMSEventObjects 11 } toPeriod OBJECT-TYPE SYNTAX OCTET
STRING MAX-ACCESS read-only STATUS current DESCRIPTION
"Ending time specification YYYYMMDDhhmmss " ::= { tekelecLSMSEventObjects
12 } controllerId OBJECT-TYPE SYNTAX OCTET STRING MAX-ACCESS read-
only STATUS current DESCRIPTION "The specific controller number
(either 0 or 1)." ::= { tekelecLSMSEventObjects 13 } driveSpecId OBJECT-
TYPE SYNTAX OCTET STRING MAX-ACCESS read-only STATUS current
DESCRIPTION "Disk drive specification." ::=
{ tekelecLSMSEventObjects 14 } shareDriveId OBJECT-TYPE SYNTAX OCTET
STRING MAX-ACCESS read-only STATUS current DESCRIPTION
"Shared disk drive physical Id." ::= { tekelecLSMSEventObjects 15 }
hotSpareDriveId OBJECT-TYPE SYNTAX OCTET STRING MAX-ACCESS read-
only STATUS current DESCRIPTION "Hot-spare disk drive physical
id." ::= { tekelecLSMSEventObjects 16 } processName OBJECT-TYPE
SYNTAX OCTET STRING MAX-ACCESS read-only STATUS current
DESCRIPTION "Name of the process (either lsmsagent or
supagent)." ::= { tekelecLSMSEventObjects 17 } diskVolName OBJECT-
TYPE SYNTAX OCTET STRING MAX-ACCESS read-only STATUS current
DESCRIPTION "Disk Volume name." ::= { tekelecLSMSEventObjects 18 }
backUpType OBJECT-TYPE SYNTAX OCTET STRING MAX-ACCESS read-
only STATUS current DESCRIPTION "DATABASE or
FILESYSTEM." ::= { tekelecLSMSEventObjects 19 } volumeName OBJECT-
TYPE SYNTAX OCTET STRING MAX-ACCESS read-only STATUS current
DESCRIPTION "The specific problem disk volume." ::=
{ tekelecLSMSEventObjects 20 } fileSystem OBJECT-TYPE SYNTAX
OCTET STRING MAX-ACCESS read-only STATUS current
DESCRIPTION "Specific LSMS filesystem with problem." ::=
{ tekelecLSMSEventObjects 21 } logFileName OBJECT-TYPE SYNTAX

```

```

OCTET STRING      MAX-ACCESS read-only      STATUS current
DESCRIPTION       "The EMS log file name."    ::= { tekelecLSMSEventObjects
22 }              errorCode OBJECT-TYPE      SYNTAX OCTET STRING      MAX-
ACCESS read-only  STATUS current            DESCRIPTION "errorCode = 2 ,
the LOG_DIR in the ShadowAudit.cfg does not exist.      errorCode = 3,
LSMS_DIR is not set in the global.shrc file.            errorCode = 4,
VERSANT_ROOT or VERSANT_REL is not set in the global.shrc file.
errorCode = 6, the /usr/local/etc/global.shrc file does not exist.
errorCode = 7, the ShadowAudit.cfg file does not exist in the $LSMS_DIR/
config directory.      errorCode = 8, the lsmsmate entry in the /etc/
hosts file does not exist or is inaccessible.          errorCode = 9, the
LSMS is unable to use the SecureShell keys or the authorized_keys file on the
shadow LSMS is missing.      errorCode = 10, the directory /var/TKLC/lsms/
logs does not have at least 20 megabytes of available disk space." ::=
{ tekelecLSMSEventObjects 23 }      servAssuranceMgrName OBJECT-TYPE
SYNTAX OCTET STRING      MAX-ACCESS read-only STATUS current
DESCRIPTION       "Service assurance manager name."  ::=
{ tekelecLSMSEventObjects 24 }      queueMgrName OBJECT-TYPE SYNTAX
OCTET STRING      MAX-ACCESS read-only STATUS current
DESCRIPTION       "Queue manager name."             ::= { tekelecLSMSEventObjects
25 }      operationCode OBJECT-TYPE SYNTAX OCTET STRING      MAX-
ACCESS read-only  STATUS current            DESCRIPTION "create, delete,
modify" ::= { tekelecLSMSEventObjects 26 }      npanxxValue OBJECT-
TYPE SYNTAX OCTET STRING      MAX-ACCESS read-only STATUS current
DESCRIPTION       "NPA-NXX" ::= { tekelecLSMSEventObjects 27 }
effectiveTimeStamp OBJECT-TYPE SYNTAX OCTET STRING      MAX-ACCESS
read-only STATUS current DESCRIPTION "YYYYMMDDhhmmss" ::=
{ tekelecLSMSEventObjects 28 }      sPID OBJECT-TYPE SYNTAX OCTET
STRING      MAX-ACCESS read-only STATUS current DESCRIPTION "4
digits alphanumeric value." ::= { tekelecLSMSEventObjects 29 }
nPANXX OBJECT-TYPE SYNTAX OCTET STRING      MAX-ACCESS read-only
STATUS current DESCRIPTION "npanxx value being created or
deleted." ::= { tekelecLSMSEventObjects 30 }      npacIP OBJECT-
TYPE SYNTAX OCTET STRING      MAX-ACCESS read-only STATUS current
DESCRIPTION       "NPAC IP address." ::= { tekelecLSMSEventObjects
31 }      lRN OBJECT-TYPE SYNTAX OCTET STRING      MAX-ACCESS read-
only STATUS current DESCRIPTION "Local Routing Number (LRN)
value being created, modified or deleted." ::= { tekelecLSMSEventObjects
32 } id2 OBJECT-TYPE SYNTAX OCTET STRING      MAX-ACCESS read-only
STATUS current DESCRIPTION "Second id." ::=
{ tekelecLSMSEventObjects 33 }      hostname OBJECT-TYPE SYNTAX
OCTET STRING      MAX-ACCESS read-only STATUS current
DESCRIPTION       "Name or IP address of host." ::=
{ tekelecLSMSEventObjects 34 } alarmBitMask OBJECT-TYPE SYNTAX OCTET
STRING      MAX-ACCESS read-only STATUS current DESCRIPTION
"Bit mask of Eagle alarm." ::= { tekelecLSMSEventObjects 35 } svNpbUsage
OBJECT-TYPE SYNTAX OCTET STRING      MAX-ACCESS read-only STATUS
current DESCRIPTION "Usage of SV/NPB storage database." ::=
{ tekelecLSMSEventObjects 36 } dbReplErr OBJECT-TYPE SYNTAX OCTET
STRING      MAX-ACCESS read-only STATUS current DESCRIPTION
"Error message from database replication." ::= { tekelecLSMSEventObjects
37 } dbMonErr OBJECT-TYPE SYNTAX OCTET STRING      MAX-ACCESS read-
only STATUS current DESCRIPTION "Error message from database
monitor daemon." ::= { tekelecLSMSEventObjects 38 } eagleAgentDataErr
OBJECT-TYPE SYNTAX OCTET STRING      MAX-ACCESS read-only STATUS
current DESCRIPTION "Error message preventing record from being

```

```

sent to network element." ::= { tekelecLSMSEventObjects 39 }
svNpbThreshold OBJECT-TYPE SYNTAX OCTET STRING MAX-ACCESS read-
only STATUS current DESCRIPTION "SV/NPB configurable usage
threshold." ::= { tekelecLSMSEventObjects 40 } oldMySQLPortNumber OBJECT-
TYPE SYNTAX OCTET STRING MAX-ACCESS read-only STATUS current
DESCRIPTION "Old MySQL Port Number." ::=
{ tekelecLSMSEventObjects 41 } newMySQLPortNumber OBJECT-TYPE SYNTAX
OCTET STRING MAX-ACCESS read-only STATUS current
DESCRIPTION "New MySQL Port Number." ::=
{ tekelecLSMSEventObjects 42 } binlogsThreshold OBJECT-TYPE SYNTAX OCTET
STRING MAX-ACCESS read-only STATUS current DESCRIPTION
"Threshold of forceful binlogs purge." ::= { tekelecLSMSEventObjects 43 }
sourceIP OBJECT-TYPE SYNTAX OCTET STRING MAX-ACCESS read-
only STATUS current DESCRIPTION "The source ip of the
device where event was generated." ::= { tekelecLSMSEventObjects
44 } resyncVar OBJECT-TYPE SYNTAX INTEGER(0..1) MAX-ACCESS read-
write STATUS current DESCRIPTION "The object is available to be set by
the NMS to indicate a request for alarm resynchronization.
Object value=0 indicates a request to stop an ongoing resnchronization and
Object value=1 indicates a resynchronization request." ::=
{ tekelecLSMSEventObjects 45 } resyncEventCnt OBJECT-TYPE
SYNTAX Unsigned32 MAX-ACCESS read-only STATUS current
DESCRIPTION "The total number of Resync alarms to be sent." ::=
{ tekelecLSMSEventObjects 46 } resyncErrCode OBJECT-TYPE
SYNTAX INTEGER MAX-ACCESS read-only STATUS current
DESCRIPTION "Enumerated value that indicates the reason for the trap." ::=
{ tekelecLSMSEventObjects 47 } alarmSequence OBJECT-TYPE SYNTAX
Unsigned32 MAX-ACCESS read-only STATUS current DESCRIPTION
"Unique sequence number identifying an SNMP Alarm Trap instance." ::=
{ tekelecLSMSEventObjects 48 } lsmsUptime OBJECT-TYPE SYNTAX
TimeTicks MAX-ACCESS read-only STATUS current DESCRIPTION
"Time since LSMS is up." ::= { tekelecLSMSEventObjects 49 } specificOid
OBJECT-TYPE SYNTAX OCTET STRING MAX-ACCESS read-only
STATUS current DESCRIPTION "Trap ID." ::=
{ tekelecLSMSEventObjects 50 } currentTime OBJECT-TYPE SYNTAX OCTET
STRING MAX-ACCESS read-only STATUS current DESCRIPTION
"Date and time string." ::= { tekelecLSMSEventObjects 51 } -- --
TRAP DEFINITIONS--
eagleAgentStarted NOTIFICATION-TYPE
OBJECTS { eventNbr, neCLLI } STATUS current DESCRIPTION
"This notification indicates that the eagleagent process has
been started. " ::= {tekelecLSMSEventsVer 1 }
eagleAgentStoppedbyscript NOTIFICATION-TYPE OBJECTS { eventNbr,
neCLLI } STATUS current DESCRIPTION "This notification
indicates that the eagleagent process has been stopped by the
sup script." ::= {tekelecLSMSEventsVer 2 }
nPACagentStarted NOTIFICATION-TYPE OBJECTS { eventNbr, nPACRegion }
STATUS current DESCRIPTION "This notification indicates that
the NPACagent for the region has been started." ::=
{tekelecLSMSEventsVer 3 } lsmsCommandStoppedNPACagent
NOTIFICATION-TYPE OBJECTS { eventNbr, nPACRegion } STATUS
current DESCRIPTION "This notification indicates that the
NPACagent process has been stopped using the lsms
command." ::= {tekelecLSMSEventsVer 4 }
primaryEMSAssocLostSecEstablished NOTIFICATION-TYPE OBJECTS { eventNbr,
neCLLI } STATUS current DESCRIPTION "This notification
indicates that the LSMS has lost association with the primary

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EMS, switching to                secondary EMS association."      ::=
{tekelecLSMSEventsVer 5 }                npacAssocEstablished NOTIFICATION-
TYPE   OBJECTS   { eventNbr, npacRegionId, npacId }   STATUS
current   DESCRIPTION   "This notification indicates that the
NPAC                association was successfully established."      ::=
{tekelecLSMSEventsVer 7 }                primaryEMSAssocEstablished NOTIFICATION-
TYPE   OBJECTS   { eventNbr, neCLLI }   STATUS        current
DESCRIPTION   "This notification indicates that the LSMS
has established the primary association with                the EMS."      ::=
{tekelecLSMSEventsVer 8 }                npacAbortByUser NOTIFICATION-
TYPE   OBJECTS   { eventNbr, npacRegionId, npacId }   STATUS
current   DESCRIPTION   "This notification indicates that the
NPAC                association has been aborted by the user."      ::=
{tekelecLSMSEventsVer 9 }npaSplitActOk NOTIFICATION-TYPE   OBJECTS
{ eventNbr, oldNPA, newNPA, nXX }   STATUS        current
DESCRIPTION   "This notification indicates that the
activated split was successful."      ::= {tekelecLSMSEventsVer
10 }switchOverStarted NOTIFICATION-TYPE   OBJECTS   { eventNbr }
STATUS        current   DESCRIPTION   "This notification indicates that
the active                server has initiated an automatic switchover                to
the inactive server."      ::= {tekelecLSMSEventsVer 11 }switchOverCompleted
NOTIFICATION-TYPE   OBJECTS   { eventNbr }   STATUS        current
DESCRIPTION   "This notification indicates that the LSMS service
Switchover process has completed."      ::= {tekelecLSMSEventsVer
12 }switchOverFailed NOTIFICATION-TYPE   OBJECTS   { eventNbr }
STATUS        current   DESCRIPTION   "This notification indicates that
the LSMS                service Switchover could not be switched over                to the
inactive server."      ::= {tekelecLSMSEventsVer 13 }diskContrService
NOTIFICATION-TYPE   OBJECTS   { eventNbr, controllerId }   STATUS
current   DESCRIPTION   "This notification indicates that the
disk                controller <controllerId> is out of service                and is
affecting shared storage. This notification                is only valid on E3000
systems."      ::= {tekelecLSMSEventsVer 14 }npacInterfaceFailure NOTIFICATION-
TYPE   OBJECTS   { eventNbr }   STATUS        current   DESCRIPTION
"This notification indicates an NPAC interface                failure. Its is
generated when the ping                utility has not receive a response
from                the interface associated with the NPAC."      ::=
{tekelecLSMSEventsVer 15 }    emsInterfaceFailure NOTIFICATION-TYPE
OBJECTS   { eventNbr }   STATUS        current   DESCRIPTION   "This
notification indicates an EMS Ethernet                interface failure. Its is
generated when the                ping utility has not receive a response
from                the interface associated with the EMS."      ::=
{tekelecLSMSEventsVer 16 }    appsInterfaceFailure NOTIFICATION-TYPE
OBJECTS   { eventNbr }   STATUS        current   DESCRIPTION   "This
notification indicates that the Ethernet                interface used to connect to
the APPLICATION                network has a problem."      ::= {tekelecLSMSEventsVer
17 }adminInterfaceFailure NOTIFICATION-TYPE   OBJECTS   { eventNbr }
STATUS        current   DESCRIPTION   "This notification indicates that
the Ethernet                interface used to connect to the ADMINISTRATION network
has a problem."      ::= {tekelecLSMSEventsVer 18 }survFeatureOn NOTIFICATION-
TYPE   OBJECTS   { eventNbr }   STATUS        current   DESCRIPTION
"This notification indicates that the Surveillance                feature is
running."      ::= {tekelecLSMSEventsVer 19 }systemDiskSynch NOTIFICATION-
TYPE   OBJECTS   { eventNbr, driveSpecId }   STATUS        current
DESCRIPTION   "This notification indicates that the system disk
has                lost synchronization, possibly due to a hardware problem."      ::=

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{tekelecLSMSEventsVer 20 }dataReplError NOTIFICATION-TYPE    OBJECTS
{ eventNbr, dbReplErr }    STATUS        current    DESCRIPTION        "This
notification indicates that database replication has failed."    ::=
{tekelecLSMSEventsVer 21 }dbMonitorFail NOTIFICATION-TYPE    OBJECTS
{ eventNbr, dbMonErr }    STATUS        current    DESCRIPTION        "This
notification indicates that the DB process monitor has failed."    ::=
{tekelecLSMSEventsVer 22 }internalDiskError NOTIFICATION-TYPE    OBJECTS
{ eventNbr }    STATUS        current    DESCRIPTION        "This notification
indicates that Volume Manager does not        recognize a shared disk that
was logically replaced by the        hot-spared disk."    ::=
{tekelecLSMSEventsVer 23 }hotSparedDataResynch NOTIFICATION-TYPE
OBJECTS    { eventNbr, shareDriveId, hotSpareDriveId }    STATUS
current    DESCRIPTION        "This notification indicates that the hot-spare
feature        has completed automatic data resynchronization."    ::=
{tekelecLSMSEventsVer 24 }dbReplInfo NOTIFICATION-TYPE    OBJECTS
{ eventNbr, dbReplErr }    STATUS        current    DESCRIPTION
"This notification indicates that DB replication delay threshold has
crossed."    ::= {tekelecLSMSEventsVer 25 }cpuUtilizationOver60 NOTIFICATION-
TYPE    OBJECTS    { eventNbr, processName, id2 }    STATUS        current
DESCRIPTION        "This notification indicates that the eagleagent
agent        or an NPACagent for a specific region is utilizing 79
percent or more of the LSMS's CPU resource."    ::= {tekelecLSMSEventsVer
26 }primaryServerInhibited NOTIFICATION-TYPE    OBJECTS    { eventNbr }
STATUS        current    DESCRIPTION        "This notification indicates that
the primary servers        state is inhibited."    ::= {tekelecLSMSEventsVer
27 }secondaryServerInhibited NOTIFICATION-TYPE    OBJECTS    { eventNbr }
STATUS        current    DESCRIPTION        "This notification indicates that
the secondary servers state is inhibited."    ::= {tekelecLSMSEventsVer
28 }heartbeatLinkDown NOTIFICATION-TYPE    OBJECTS    { eventNbr }
STATUS        current    DESCRIPTION        "This notification indicates that a
Heartbeat link is down."    ::= {tekelecLSMSEventsVer
29 }heartbeatLinkTwoDown NOTIFICATION-TYPE    OBJECTS    { eventNbr }
STATUS        current    DESCRIPTION        "This notification indicates that
the Heartbeat 2 link is down."    ::= {tekelecLSMSEventsVer
30 }lsmsNtwkConfigError NOTIFICATION-TYPE    OBJECTS    { eventNbr }
STATUS        current    DESCRIPTION        "This notification indicates that
the LSMS network configuration is incorrect."    ::= {tekelecLSMSEventsVer
31 }networkConfigNotSupported NOTIFICATION-TYPE    OBJECTS
{ eventNbr }    STATUS        current    DESCRIPTION        "This notification
indicates that the LSMS network configuration        is not supported or
recommended."    ::= {tekelecLSMSEventsVer 32 }emsRequiresResynchWithLSMS
NOTIFICATION-TYPE    OBJECTS    { eventNbr, neCLLI }    STATUS
current    DESCRIPTION        "This notification indicates that an EMS (OAP)
requires        a resynchronization with the LSMS. See customer
documentation        for database synchronization procedure."    ::=
{tekelecLSMSEventsVer 33 }resynchLogMidFull NOTIFICATION-TYPE    OBJECTS
{ eventNbr }    STATUS        current    DESCRIPTION        "This notification
indicates that the network element        resynchronization database
contains more than 1000000        entries. Run devresync utility."    ::=
{tekelecLSMSEventsVer 34 }primaryEMSAssocLostNoSec NOTIFICATION-TYPE
OBJECTS    { eventNbr, neCLLI }    STATUS        current    DESCRIPTION
"This notification indicates that the LSMS has lost association        with
the primary EMS and the secondary association is not established."    ::=
{tekelecLSMSEventsVer 36 }lostNPACAssoc NOTIFICATION-TYPE    OBJECTS
{ eventNbr, npacId, npacRegionId }    STATUS        current
DESCRIPTION        "This notification indicates that the NPAC association

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was disconnected gracefully by the user." ::=
{tekelecLSMSEventsVer 37 }diskVolume95Usage NOTIFICATION-TYPE OBJECTS
{ eventNbr, diskVolName } STATUS current DESCRIPTION "This
notification indicates that the disk volume specified by diskVolName
has exceeded the 95 percent usage threshold." ::= {tekelecLSMSEventsVer
38 }swapSpaceCritical NOTIFICATION-TYPE OBJECTS { eventNbr }
STATUS current DESCRIPTION "This notification indicates that
the server's system check has raised a swap space critical
alarm." ::= {tekelecLSMSEventsVer 39 }lsmsAppsNotRunning NOTIFICATION-
TYPE OBJECTS { eventNbr, processName } STATUS current
DESCRIPTION "This notification indicates that a specific LSMS
application or system daemon is not running." ::=
{tekelecLSMSEventsVer 40 }backupCompleted NOTIFICATION-TYPE OBJECTS
{ eventNbr, backUpType } STATUS current DESCRIPTION "This
notification indicates that a backup of the specified LSMS disk
(DATABASE or FILESYSTEM) has completed successfully." ::=
{tekelecLSMSEventsVer 41 }backupFailed NOTIFICATION-TYPE OBJECTS
{ eventNbr, backUpType } STATUS current DESCRIPTION "This
notification indicates that a backup of the specified LSMS disk
(DATABASE or FILESYSTEM) has failed." ::= {tekelecLSMSEventsVer
42 }emsPendingQueueHalfFull NOTIFICATION-TYPE OBJECTS { eventNbr,
neCLLI } STATUS current DESCRIPTION "This notification
indicates that the pending queue used to hold the transactions to
send to the network element is over half full." ::= {tekelecLSMSEventsVer
43 }emsPendingQueueMaxReached NOTIFICATION-TYPE OBJECTS { eventNbr,
neCLLI } STATUS current DESCRIPTION "This notification
indicates that the pending queue used to hold the transactions to
send to the network element is completely full." ::= {tekelecLSMSEventsVer
44 }failedNPACConnectivity NOTIFICATION-TYPE OBJECTS { eventNbr,
npacRegionId } STATUS current DESCRIPTION "This
notification indicates that the LSMS is not able to confirm the
physical connectivity with the NPAC whose NPAC region is npacRegionId" ::=
{tekelecLSMSEventsVer 45 }eagleAgentIgnoreRecord NOTIFICATION-TYPE
OBJECTS { eventNbr, neCLLI, eagleAgentDataErr } STATUS current
DESCRIPTION "This notification indicates that there was a data error
in a record preventing the eagleagent from sending it to the network
element" ::= {tekelecLSMSEventsVer 46 }primaryServerNotOnline NOTIFICATION-
TYPE OBJECTS { eventNbr } STATUS current DESCRIPTION
"This notification indicates that the primary LSMS server is not
online." ::= {tekelecLSMSEventsVer 63 }secServerNotPreparedForTakeover
NOTIFICATION-TYPE OBJECTS { eventNbr } STATUS current
DESCRIPTION "This notification indicates that the secondary LSMS
server is not prepared to take over LSMS service." ::=
{tekelecLSMSEventsVer 64 }secServerProvidingLSMSService NOTIFICATION-TYPE
OBJECTS { eventNbr } STATUS current DESCRIPTION "This
notification indicates that the secondary LSMS server is currently
providing the LSMS service." ::= {tekelecLSMSEventsVer
65 }secServerCannotDeterminePrimAvail NOTIFICATION-TYPE OBJECTS
{ eventNbr } STATUS current DESCRIPTION "This notification
indicates that the secondary LSMS server cannot determined the
availability of the LSMS service on the primary server." ::=
{tekelecLSMSEventsVer 66 }serviceAssuranceAgentStarted NOTIFICATION-TYPE
OBJECTS { eventNbr } STATUS current DESCRIPTION "This
notification indicates that the Service Assurance agent has started
successfully." ::= {tekelecLSMSEventsVer
67 }establishServAssuranceMgrAssoc NOTIFICATION-TYPE OBJECTS

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{ eventNbr, servAssuranceMgrName } STATUS current
DESCRIPTION "This notification indicates that the association
with the Service Assurance manager has been established
successfully." ::= {tekelecLSMSEventsVer 68 }servAssuranceMgrAssocBroken
NOTIFICATION-TYPE OBJECTS { eventNbr, servAssuranceMgrName }
STATUS current DESCRIPTION "This notification indicates that
the association with the Service Assurance manager has been stopped
or disconnected." ::= {tekelecLSMSEventsVer
69 }servAssuranceAgentNotRunning NOTIFICATION-TYPE OBJECTS
{ eventNbr } STATUS current DESCRIPTION "This notification
indicates that the Service Assurance agent is not currently
running." ::= {tekelecLSMSEventsVer 70 }noPhysicalConnectivityToDCM
NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI } STATUS
current DESCRIPTION "This notification indicates that the LSMS is
not able to confirm physical connectivity with the DCM." ::=
{tekelecLSMSEventsVer 73 }lsmsEagleAgentFailed NOTIFICATION-TYPE
OBJECTS { eventNbr, neCLLI } STATUS current DESCRIPTION
"This notification indicates that the LSMS eagleagent process has
failed. The sentry daemon process will attempt to restart." ::=
{tekelecLSMSEventsVer 74 }lsmsEagleAgentRestarted NOTIFICATION-TYPE
OBJECTS { eventNbr, neCLLI } STATUS current DESCRIPTION
"This notification indicates that the LSMS eagleagent process has
been successfully restarted by the sentry daemon process." ::=
{tekelecLSMSEventsVer 75 }failureToRestartEagleAgent NOTIFICATION-TYPE
OBJECTS { eventNbr, neCLLI } STATUS current DESCRIPTION
"This notification indicates that the sentry daemon process was
unable to restart the eagleAgent." ::= {tekelecLSMSEventsVer
76 }nPACagentForRegionFailure NOTIFICATION-TYPE OBJECTS { eventNbr,
nPACRegion } STATUS current DESCRIPTION "This notification
indicates that the NPACagent process for the region specified by
nPACRegion has failed. The sentry daemon will attempt to restart the
NPACagent process." ::= {tekelecLSMSEventsVer
78 }nPACagentForRegionRestarted NOTIFICATION-TYPE OBJECTS { eventNbr,
nPACRegion } STATUS current DESCRIPTION "This notification
indicates that the NPACagent process for the region specified by
nPACRegion has been successfully restarted by the sentry
daemon." ::= {tekelecLSMSEventsVer 79 }failureToRestartNPACagentRegion
NOTIFICATION-TYPE OBJECTS { eventNbr, nPACRegion } STATUS
current DESCRIPTION "This notification indicates that the sentry
daemon process was unable to restart the NPACagent process for the
region specified by nPACRegion." ::= {tekelecLSMSEventsVer
80 }osiDeamonFailure NOTIFICATION-TYPE OBJECTS { eventNbr }
STATUS current DESCRIPTION "This notification indicates that
the one of the Sunlink OSI daemons, either osinetd or osilogd, has
failed. The lsmssentry process will attempt to restart." ::=
{tekelecLSMSEventsVer 88 }osiDeamonRestarted NOTIFICATION-TYPE OBJECTS
{ eventNbr } STATUS current DESCRIPTION "This notification
indicates that the osinetd or osilogd, daemon has been successfully
restarted by the lsmssentry process." ::= {tekelecLSMSEventsVer
89 }osiDeamonRestartFailure NOTIFICATION-TYPE OBJECTS { eventNbr }
STATUS current DESCRIPTION "This notification indicates that
the lsmssentry process was not able to restart the osinet or osilogd
daemons." ::= {tekelecLSMSEventsVer 90 }lsmssentryFailure NOTIFICATION-
TYPE OBJECTS { eventNbr } STATUS current DESCRIPTION
"This notification indicates that the Surveillance feature has
detected that the sentry daemon process is no longer running." ::=

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{tekelecLSMSEventsVer 91 }iddAgentRestarted NOTIFICATION-TYPE  OBJECTS
{ eventNbr } STATUS current DESCRIPTION "This notification
indicates that the surveillance process has detected that the Legacy
lddAgent process has restarted and all functionality has
resumed." ::= {tekelecLSMSEventsVer 92 }scpmsIddAgentRestarted
NOTIFICATION-TYPE  OBJECTS { eventNbr } STATUS current
DESCRIPTION "This notification indicates that the surveillance process
has detected that the SCPMS lddAgent process has restarted and
all functionality has resumed." ::= {tekelecLSMSEventsVer
93 }npacRejectedAssocAccessCtrlFail NOTIFICATION-TYPE  OBJECTS
{ eventNbr, npacId, npacRegionId } STATUS current
DESCRIPTION "This notification indicates that the NPAC aborted
association because it received a message from LSMS that failed
security checks." ::= {tekelecLSMSEventsVer
95 }npacRejectedAssocInvalidData NOTIFICATION-TYPE  OBJECTS { eventNbr,
npacId, npacRegionId } STATUS current DESCRIPTION "This
notification indicates that the NPAC aborted the association because
NPAC received invalid data from LSMS." ::= {tekelecLSMSEventsVer
96 }emaAssociationAbortedQueueFull NOTIFICATION-TYPE  OBJECTS
{ eventNbr, neCLLI } STATUS current DESCRIPTION "This
notification indicates that all associations to the EMS are aborted,
since the pending queue used to hold transactions to be send to the
EMS/NE is full." ::= {tekelecLSMSEventsVer 97 }emsAssocAbortedMaxResend
NOTIFICATION-TYPE  OBJECTS { eventNbr, neCLLI } STATUS
current DESCRIPTION "This notification indicates that all
associations to the EMS are aborted, since the eagleagent has already
tried resending the same message the maximum number of times." ::=
{tekelecLSMSEventsVer 98 }assocRespNPACTimeout NOTIFICATION-TYPE
OBJECTS { eventNbr, npacId, npacRegionId } STATUS current
DESCRIPTION "This notification indicates that the LSMS did not
receive an association response from the NPAC within the timeout
period. The LSMS will attempt the association with the NPAC again
after configurable amount of time." ::= {tekelecLSMSEventsVer
100 }assocRejectedRetrySameHost NOTIFICATION-TYPE  OBJECTS { eventNbr,
npacId, npacRegionId } STATUS current DESCRIPTION "This
notification indicates that the NPAC association was rejected by the
NPAC, and the LSMS was informed to attempt the NPAC association again
to the same NPAC host after configurable amount of time." ::=
{tekelecLSMSEventsVer 101 }assocRejectedRetryOtherHost NOTIFICATION-TYPE
OBJECTS { eventNbr, npacId, npacRegionId } STATUS current
DESCRIPTION "This notification indicates that the NPAC association
was rejected by the NPAC, and the LSMS was informed to
attempt the NPAC association again to the other NPAC host after
after configurable amount of time." ::= {tekelecLSMSEventsVer
102 } nwtkProblemRetryNPACAssoc NOTIFICATION-TYPE  OBJECTS
{ eventNbr, npacId, npacRegionId } STATUS current
DESCRIPTION "This notification indicates that a problem exists
in the network connectivity. The LSMS will attempt the
association with the NPAC again after configurable amount of
time." ::= {tekelecLSMSEventsVer 103 }lsmsAbortedNPACassocDowRecFail
NOTIFICATION-TYPE  OBJECTS { eventNbr, npacId, npacRegionId }
STATUS current DESCRIPTION "This notification indicates that
the LSMS received three consecutive responses from the NPAC with a
download status of failure from a recovery request. The LSMS
has aborted the associations and will attempt to associate again
after configurable amount of time. The LSMS will retry the recovery
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action after the association is reestablished." ::= {tekelecLSMSEventsVer
104 }nwtkConnProblemNPACAssocAborted NOTIFICATION-TYPE OBJECTS
{ eventNbr, npacId, npacRegionId } STATUS current
DESCRIPTION "This notification indicates that the NPAC association
was aborted due to a network connectivity loss between the LSMS and
the NPAC." ::= {tekelecLSMSEventsVer 105 }assocRejDueToAccessControl
NOTIFICATION-TYPE OBJECTS { eventNbr, npacId, npacRegionId }
STATUS current DESCRIPTION "This notification indicates that
the NPAC rejected the association request because it could not
validate access control." ::= {tekelecLSMSEventsVer
106 }npacAssocRejDuetoAccessDenied NOTIFICATION-TYPE OBJECTS
{ eventNbr, npacId, npacRegionId } STATUS current
DESCRIPTION "This notification indicates that the NPAC
rejected the association with an indication of access denied." ::=
{tekelecLSMSEventsVer 107 }npacConnFailedCMIP NOTIFICATION-TYPE OBJECTS
{ eventNbr, npacId, npacRegionId } STATUS current
DESCRIPTION "This notification indicates that the NPAC
connection attempt failed, because the userInfo value in the
cmipUserInfo portion of the NPAC association response CMIP message is
invalid." ::= {tekelecLSMSEventsVer 108 }npacAssocGracefullyTerminated
NOTIFICATION-TYPE OBJECTS { eventNbr, npacId, npacRegionId }
STATUS current DESCRIPTION "This notification indicates that
the NPAC association was terminated gracefully by the NPAC." ::=
{tekelecLSMSEventsVer 109 }lsmsDataLostBadResynch NOTIFICATION-TYPE
OBJECTS { eventNbr, npacId, npacRegionId } STATUS current
DESCRIPTION "This notification indicates that the LSMS was not
resynchronized properly with the NPAC. There are multiple steps in
recovery. All steps failed." ::= {tekelecLSMSEventsVer
112 }badNPACresynchTime NOTIFICATION-TYPE OBJECTS { eventNbr, npacId,
npacRegionId } STATUS current DESCRIPTION "This
notification indicates that the LSMS was not resynchronized properly
with the NPAC. There are multiple steps in recovery. Some steps
failed." ::= {tekelecLSMSEventsVer 113 }assocAbortedBadKeys NOTIFICATION-
TYPE OBJECTS { eventNbr, npacId, npacRegionId } STATUS
current DESCRIPTION "This notification indicates that the LSMS
aborted the NPAC association because the LSMS received a
message from the NPAC that did not have the correct LSMS key
signature." ::= {tekelecLSMSEventsVer 114 }scpmsMqSeriesFault NOTIFICATION-
TYPE OBJECTS { eventNbr } STATUS current DESCRIPTION
"This notification indicates that the LDD SCPMS Confirmation of
Arrival message retry attempts have been exhausted. The MQSeries
interface is not operational or network connectivity to the remote
system is lost." ::= {tekelecLSMSEventsVer 116 }scpmsNotActive
NOTIFICATION-TYPE OBJECTS { eventNbr } STATUS current
DESCRIPTION "This notification indicates that the LDD SCPMS
system has not provided a response within the time limit
specified by the LDD_SCP_SYSTEM_RESPONSE_TOMEOUT configuration
parameter. The SCPMS system is not active." ::=
{tekelecLSMSEventsVer 117 }legacyMqSeriesFault NOTIFICATION-TYPE
OBJECTS { eventNbr } STATUS current DESCRIPTION "This
notification indicates that the LDD Legacy Confirmation of Arrival
message retry attempts have been exhausted. The MQSeries interface is
not operational or network connectivity to the remote system is
lost." ::= {tekelecLSMSEventsVer 118 }scpmsLegacyNotActive NOTIFICATION-
TYPE OBJECTS { eventNbr } STATUS current DESCRIPTION
"This notification indicates that the LDD Legacy system has not

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provided a response within the time limit specified by the
LDD_SCP_SYSTEM_RESPONSE_TOMEOUT configuration parameter. The SCPMS
system is not active." ::= {tekelecLSMSEventsVer
119 }mqSeriesQueueManagerNotActive NOTIFICATION-TYPE OBJECTS
{ eventNbr, queueMgrName } STATUS current DESCRIPTION
"This notification indicates that A connection could not be made to
the MQSeries local queue manager. The local queue manager is not
started or operational." ::= {tekelecLSMSEventsVer
120 }npacAutoAssociationRetryCanceled NOTIFICATION-TYPE OBJECTS
{ eventNbr, npacId, npacRegionId } STATUS current
DESCRIPTION "This notification indicates that an NPAC automatic
associations retry has been canceled." ::= {tekelecLSMSEventsVer
122 }npacRecoveryFailureResourceLimitation NOTIFICATION-TYPE OBJECTS
{ eventNbr, npacId, npacRegionId, retryTimes, npacRecoveryRetryInterval }
STATUS current DESCRIPTION "This notification indicates that
the LSMS received a response from the NPAC with a download status of
failure from a recovery action request. The NPAC is unable to process
the recovery action due to a temporary resource limitation. The LSMS
will retry the request after five minutes." ::=
{tekelecLSMSEventsVer 123 }npacAssocPeriodDown NOTIFICATION-TYPE
OBJECTS { eventNbr, npacId, npacRegionId, fromPeriod, toPeriod }
STATUS current DESCRIPTION "This notification indicates that
the NPAC association will be down for the specified period of time
due to NPAC-scheduled down time." ::= {tekelecLSMSEventsVer
124 }npacAssocRequestSentAfterRetryTimer NOTIFICATION-TYPE OBJECTS
{ eventNbr, npacId, npacRegionId } STATUS current
DESCRIPTION "This notification indicates that an associate request has
been sent to the NPAC after retry timer has expired." ::=
{tekelecLSMSEventsVer 125 }npanxxGTTValueNotFound NOTIFICATION-TYPE
OBJECTS { eventNbr, neCLLI, operationCode } STATUS current
DESCRIPTION "This notification indicates that the EMS/NE has
rejected the NPANXX GTT creation, deletion or modification
transaction, and the NPANXX value in the transaction could not be
determined." ::= {tekelecLSMSEventsVer 126 }npanxxGTTValueRejected
NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI, operationCode,
npanxxValue } STATUS current DESCRIPTION "This
notification indicates that the EMS/NE has rejected the NPANXX GTT
creation, deletion or modification transaction for the specified
NPANXX value." ::= {tekelecLSMSEventsVer 127 }overrideGTTValueNotFound
NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI, operationCode }
STATUS current DESCRIPTION "This notification indicates that
the EMS/NE has rejected the Override GTT creation, deletion or
modification transaction, and the LRN value in the transaction could
not be determined." ::= {tekelecLSMSEventsVer
128 }overrideGTTValueRejected NOTIFICATION-TYPE OBJECTS { eventNbr,
neCLLI, operationCode, LRN } STATUS current DESCRIPTION
"This notification indicates that the EMS/NE has rejected the
Override GTT creation, deletion or modification transaction for the
specified LRN value." ::= {tekelecLSMSEventsVer 129 }secondaryEMSAssocLost
NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI } STATUS
current DESCRIPTION "This notification indicates that the LSMS has
lost association with the secondary EMS, the primary association is
still up." ::= {tekelecLSMSEventsVer 130 }unableToCompleteAutoResynch
NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI } STATUS
current DESCRIPTION "This notification indicates that the LSMS was
not able to complete automatic synchronization with the EMS/

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NE."      ::= {tekelecLSMSEventsVer 131 }autoResynchNEStarted NOTIFICATION-
TYPE      OBJECTS      { eventNbr, neCLLI }      STATUS      current
DESCRIPTION      "This notification indicates that the LSMS has started
its      automatic synchronization with the EMS/NE."      ::=
{tekelecLSMSEventsVer 132 }dbResynchCompleted NOTIFICATION-TYPE      OBJECTS
{ eventNbr, npacId }      STATUS      current      DESCRIPTION      "This
notification indicates that the Automatic resynchronization      of
databases after an outage between the LSMS and the NPAC has      completed
successfully."      ::= {tekelecLSMSEventsVer 133 }secondaryEMSAssocEstablished
NOTIFICATION-TYPE      OBJECTS      { eventNbr, neCLLI }      STATUS
current      DESCRIPTION      "This notification indicates that the LSMS has
established      the second association with the EMS. This association
is      only established if a primary association already exists."      ::=
{tekelecLSMSEventsVer 134 }emsShortSynchCompleted NOTIFICATION-TYPE
OBJECTS      { eventNbr, neCLLI }      STATUS      current      DESCRIPTION
"This notification indicates that the LSMS has completed      Short
Synchronization with the EMS."      ::= {tekelecLSMSEventsVer
138 }transactionToSecondary NOTIFICATION-TYPE      OBJECTS      { eventNbr,
neCLLI }      STATUS      current      DESCRIPTION      "This notification
indicates that the Primary EMS association      is either down or is
inhibited, such that transaction sent to      the primary EMS will not be
received by the network element.      Transactions are being sent to the
secondary EMS instead of the primary EMS."      ::= {tekelecLSMSEventsVer
139 }pendingQueueHalfFullClear NOTIFICATION-TYPE      OBJECTS
{ eventNbr }      STATUS      current      DESCRIPTION      "This notification
indicates that the EMS Pending Queue is less than half full."      ::=
{tekelecLSMSEventsVer 141 }pendingQueueFullClear NOTIFICATION-TYPE
OBJECTS      { eventNbr }      STATUS      current      DESCRIPTION      "This
notification indicates that the EMS Pending Queue is no longer full."      ::=
{tekelecLSMSEventsVer 142 }dcmConnectionRestored NOTIFICATION-TYPE
OBJECTS      { eventNbr, neCLLI }      STATUS      current      DESCRIPTION
"This notification indicates that physical connection has been
restored with the DCM."      ::= {tekelecLSMSEventsVer
143 }connToMqSeriesQueueMgrRest NOTIFICATION-TYPE      OBJECTS      { eventNbr,
queueMgrName }      STATUS      current      DESCRIPTION      "This
notification indicates that the connection to the MQSeries      local
queue manager has been established following an outage."      ::=
{tekelecLSMSEventsVer 144 }npaNxxOpenedForPortabilityAtTS NOTIFICATION-
TYPE      OBJECTS      { eventNbr, sPID, nPANXX, effectiveTimeStamp }
STATUS      current      DESCRIPTION      "This notification indicates that
the specified NPA-NXX is opened      for portability starting at value of
the EffectiveTimeStamp field."      ::= {tekelecLSMSEventsVer
145 }npaNxxPortedAtTS NOTIFICATION-TYPE      OBJECTS      { eventNbr, sPID,
nPANXX, effectiveTimeStamp }      STATUS      current      DESCRIPTION
"This notification indicates that the first telephone number in      the
specified NPA-NXX is ported stating at the value of      the
EffectiveTimeStamp field."      ::= {tekelecLSMSEventsVer 146 }ebdaAuditActive
NOTIFICATION-TYPE      OBJECTS      { eventNbr, neCLLI }      STATUS
current      DESCRIPTION      "This notification indicates that an Audit is
currently running."      ::= {tekelecLSMSEventsVer 147 }ebdaAuditSuccess
NOTIFICATION-TYPE      OBJECTS      { eventNbr, neCLLI }      STATUS
current      DESCRIPTION      "This notification indicates that an Audit has
completed successfully."      ::= {tekelecLSMSEventsVer 148 }ebdaAuditFailure
NOTIFICATION-TYPE      OBJECTS      { eventNbr, neCLLI }      STATUS
current      DESCRIPTION      "This notification indicates that an Audit has
failed."      ::= {tekelecLSMSEventsVer 149 }ebdaAuditAbortedByUser

```



```

NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI } STATUS
current DESCRIPTION "This notification indicates that an Audit has
been aborted by the user prior to completion." ::=
{tekelecLSMSEventsVer 150 }ebdaReconcileActive NOTIFICATION-TYPE
OBJECTS { eventNbr, neCLLI } STATUS current DESCRIPTION
"This notification indicates that a reconcile is currently running." ::=
{tekelecLSMSEventsVer 151 }ebdaReconcileSuccess NOTIFICATION-TYPE
OBJECTS { eventNbr, neCLLI } STATUS current DESCRIPTION
"This notification indicates that a reconcile has completed
successfully." ::= {tekelecLSMSEventsVer 152 }ebdaReconcileFailure
NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI } STATUS
current DESCRIPTION "This notification indicates that a reconcile
has failed." ::= {tekelecLSMSEventsVer 153 }ebdaReconcileAbortedByUser
NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI } STATUS
current DESCRIPTION "This notification indicates that a reconcile
has been aborted by the user prior to completion." ::=
{tekelecLSMSEventsVer 154 }ebdaBulkLoadActive NOTIFICATION-TYPE OBJECTS
{ eventNbr, neCLLI } STATUS current DESCRIPTION "This
notification indicates that a bulk load is currently running." ::=
{tekelecLSMSEventsVer 159 }ebdaBulkLoadSuccess NOTIFICATION-TYPE
OBJECTS { eventNbr, neCLLI } STATUS current DESCRIPTION
"This notification indicates that a bulk load has completed
successfully." ::= {tekelecLSMSEventsVer 160 } ebdaBulkLoadFailure
NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI } STATUS
current DESCRIPTION "This notification indicates that a bulk load
has failed." ::= {tekelecLSMSEventsVer 161 }ebdaBulkLoadAbortedByUser
NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI } STATUS
current DESCRIPTION "This notification indicates that a bulk load
has been aborted by the user prior to completion." ::=
{tekelecLSMSEventsVer 162 }ebdaResyncActive NOTIFICATION-TYPE OBJECTS
{ eventNbr, neCLLI } STATUS current DESCRIPTION "This
notification indicates that a re-sync is currently running." ::=
{tekelecLSMSEventsVer 163 }ebdaResyncSuccess NOTIFICATION-TYPE OBJECTS
{ eventNbr, neCLLI } STATUS current DESCRIPTION "This
notification indicates that a re-sync has completed successfully." ::=
{tekelecLSMSEventsVer 164 }ebdaResyncFailure NOTIFICATION-TYPE OBJECTS
{ eventNbr, neCLLI } STATUS current DESCRIPTION "This
notification indicates that a re-sync has failed." ::=
{tekelecLSMSEventsVer 165 }ebdaResyncAbortedByUser NOTIFICATION-TYPE
OBJECTS { eventNbr, neCLLI } STATUS current DESCRIPTION
"This notification indicates that a re-sync has been aborted by the
user prior to completion." ::= {tekelecLSMSEventsVer
166 }sprintIddAgentCommFailureLegSys NOTIFICATION-TYPE OBJECTS
{ eventNbr } STATUS current DESCRIPTION "This notification
indicates that the Sprint lddAgent has failed to communicate with the
Sprint Legacy System." ::= {tekelecLSMSEventsVer
167 }sprintIddAgentCommFailureScpmsSys NOTIFICATION-TYPE OBJECTS
{ eventNbr } STATUS current DESCRIPTION "This notification
indicates that the Sprint lddAgent has failed to communicate with the
Sprint SCPMS System." ::= {tekelecLSMSEventsVer
168 }lsmsMirroringInconsistance NOTIFICATION-TYPE OBJECTS { eventNbr,
volumeName } STATUS current DESCRIPTION "This notification
indicates an LSMS mirroring inconsistentane." ::= {tekelecLSMSEventsVer
169 }lsmsFilesystemNotWritable NOTIFICATION-TYPE OBJECTS { eventNbr,
fileSystem } STATUS current DESCRIPTION "This notification
indicates that the LSMS filesystem is not writeable." ::=

```

```

{tekelecLSMSEventsVer 170 }automaticFileTransferFeatureFailure NOTIFICATION-
TYPE OBJECTS { eventNbr } STATUS current DESCRIPTION
"This notification indicates that the Automatic File Transfer feature
has a failure." ::= {tekelecLSMSEventsVer 171 }npaSplitActFailed
NOTIFICATION-TYPE OBJECTS { eventNbr, oldNPA, newNPA, nXX }
STATUS current DESCRIPTION "This notification indicates the
failure of an NPASplit activation." ::= {tekelecLSMSEventsVer
172 }activeSplitsPastEndDates NOTIFICATION-TYPE OBJECTS
{ eventNbr } STATUS current DESCRIPTION "This notification
indicates that some active splits are past their End Dates and should
be deleted." ::= {tekelecLSMSEventsVer
173 }lddScpmsAgentSwitchToBackupScpms NOTIFICATION-TYPE OBJECTS
{ eventNbr } STATUS current DESCRIPTION "This notification
indicates the LDD SCPMS agent is switching from primary to backup
SCPMS system." ::= {tekelecLSMSEventsVer
174 }lddScpmsAgentSwitchFromBackupToPrim NOTIFICATION-TYPE OBJECTS
{ eventNbr } STATUS current DESCRIPTION "This notification
indicates the LDD SCPMS agent is switching from backup to primary
SCPMS system." ::= {tekelecLSMSEventsVer 175 }lddScpmsPrimary NOTIFICATION-
TYPE OBJECTS { eventNbr } STATUS current DESCRIPTION
"This notification indicates the LDD SCPMS current system is primary
SCPMS." ::= {tekelecLSMSEventsVer 176 }lddScpmsBackup NOTIFICATION-TYPE
OBJECTS { eventNbr } STATUS current DESCRIPTION "This
notification indicates the LDD SCPMS current system is backup SCPMS." ::=
{tekelecLSMSEventsVer 177 }emsNeRejNpaNxxSplitNotDetermined NOTIFICATION-
TYPE OBJECTS { eventNbr, neCLLI, operationCode } STATUS
current DESCRIPTION "This notification indicates that the EMS/NE
has rejected the NPANXX Split creation or deletion transaction,
and the NPANXX value in the transaction could not be
determined." ::= {tekelecLSMSEventsVer 178 }emsNeRejectedNpaNxxSplit
NOTIFICATION-TYPE OBJECTS { eventNbr, neCLLI, operationCode,
nPANXX } STATUS current DESCRIPTION "This notification
indicates that the EMS/NE has rejected the NPANXX Split creation or
deletion transaction for the specified NPANXX value." ::=
{tekelecLSMSEventsVer 179 }physicalConnectivityWithQueryServerLost
NOTIFICATION-TYPE OBJECTS { eventNbr, hostname } STATUS
current DESCRIPTION "This notification indicates that the LSMS is
not able to confirm the physical connectivity with the Query Server
for the specified hostname." ::= {tekelecLSMSEventsVer
180 }queryServerConnectionWithLsmsLost NOTIFICATION-TYPE OBJECTS
{ eventNbr, hostname } STATUS current DESCRIPTION "This
notification indicates that the Query Server identified by the
hostname does not have a connection with the LSMS." ::=
{tekelecLSMSEventsVer 181 }nPACagentStopRegDBaccessFault NOTIFICATION-TYPE
OBJECTS { eventNbr, nPACRegion } STATUS current
DESCRIPTION "This notification indicates that the NPACagent process
has been stopped due to fault in accessing the regional
database." ::= {tekelecLSMSEventsVer 189 }swapSpaceWarning NOTIFICATION-
TYPE OBJECTS { eventNbr } STATUS current DESCRIPTION
"This notification indicates that the server's system check has
raised a swap space warning alarm." ::= {tekelecLSMSEventsVer
190 }minorPlatAlarmMask NOTIFICATION-TYPE OBJECTS { eventNbr,
alarmBitMask } STATUS current DESCRIPTION "This
notification indicates that minor Platform alarms have been raised as
indicated by the alarm BitMask." ::= {tekelecLSMSEventsVer
191 }majorPlatAlarmMask NOTIFICATION-TYPE OBJECTS { eventNbr,

```

```

alarmBitMask } STATUS current DESCRIPTION "This
notification indicates that major Platform alarms have been raised as
indicated by the alarm BitMask." ::= {tekelecLSMSEventsVer
192 }criticalPlatAlarmMask NOTIFICATION-TYPE OBJECTS { eventNbr,
alarmBitMask } STATUS current DESCRIPTION "This
notification indicates that critical Platform alarms have been raised
as indicated by the alarm BitMask." ::= {tekelecLSMSEventsVer
193 }svNpbPercentUsage NOTIFICATION-TYPE OBJECTS { eventNbr,
svNpbThreshold, svNpbUsage } STATUS current DESCRIPTION
"This notification indicates that the SV/NPB storage database has
exceeded the configured percent usage threshold." ::=
{tekelecLSMSEventsVer 194 }dataReplClear NOTIFICATION-TYPE OBJECTS
{ eventNbr, dbReplErr } STATUS current DESCRIPTION "This
notification indicates that the system is ready for database
replication." ::= {tekelecLSMSEventsVer 195 }dbMonitorClear NOTIFICATION-
TYPE OBJECTS { eventNbr, dbMonErr } STATUS current
DESCRIPTION "This notification indicates that the DB process monitor
has been cleared." ::= {tekelecLSMSEventsVer 196 } minorPlatAlarmClear
NOTIFICATION-TYPE OBJECTS { eventNbr } STATUS current
DESCRIPTION "This notification indicates that the server's system
check process has cleared all minor platform alarms." ::=
{tekelecLSMSEventsVer 197 } majorPlatAlarmClear NOTIFICATION-TYPE
OBJECTS { eventNbr } STATUS current DESCRIPTION "This
notification indicates that the server's system check process has cleared all
major platform alarms." ::= {tekelecLSMSEventsVer 198 }
criticalPlatAlarmClear NOTIFICATION-TYPE OBJECTS { eventNbr }
STATUS current DESCRIPTION "This notification indicates that
the server's system check process has cleared all critical platform
alarms." ::= {tekelecLSMSEventsVer 199 }dbCorruptIndex NOTIFICATION-
TYPE OBJECTS { eventNbr, dbMonErr } STATUS current
DESCRIPTION "This notification indicates that the LSMS database has
corruption." ::= {tekelecLSMSEventsVer 200 }invalidSnapshot NOTIFICATION-
TYPE OBJECTS { eventNbr, dbMonErr } STATUS current
DESCRIPTION "This notification indicates that the LSMS server has
an Invalid Snapshot." ::= {tekelecLSMSEventsVer 201 }invalidSnapshotClear
NOTIFICATION-TYPE OBJECTS { eventNbr, dbMonErr } STATUS
current DESCRIPTION "This notification indicates that the
Invalid Snapshot has been cleared from the LSMS server." ::=
{tekelecLSMSEventsVer 202 }fullSnapshot NOTIFICATION-TYPE OBJECTS
{ eventNbr, dbMonErr } STATUS current DESCRIPTION
"This notification indicates that the snapshot space usage is greater than
the MAX_USAGE percent." ::= {tekelecLSMSEventsVer 203 }fullSnapshotClear
NOTIFICATION-TYPE OBJECTS { eventNbr, dbMonErr } STATUS
current DESCRIPTION "This notification indicates that the
snapshot full space usage Error is cleared." ::= {tekelecLSMSEventsVer
204 }mateServerDown NOTIFICATION-TYPE OBJECTS { eventNbr }
STATUS current DESCRIPTION "This notification indicates that
mate server is Down." ::= {tekelecLSMSEventsVer 205 }mateServerUp
NOTIFICATION-TYPE OBJECTS { eventNbr } STATUS current
DESCRIPTION "This notification indicates that mate server is
Up." ::= {tekelecLSMSEventsVer 206 }svNpbBelowLimit NOTIFICATION-TYPE
OBJECTS { eventNbr, svNpbThreshold, svNpbUsage } STATUS
current DESCRIPTION "This notification indicates that the SV/NPB
storage database usage is below the configured percent usage
threshold." ::= {tekelecLSMSEventsVer 207 }mysqlPortUpdated NOTIFICATION-
TYPE OBJECTS { eventNbr, oldMySQLPortNumber, newMySQLPortNumber }

```

```

STATUS      current      DESCRIPTION      "This notification indicates that
the MySQL Port has been updated. LSMS application restart is
required."      ::= {tekelecLSMSEventsVer 208 }queryServerResetConfiguration
NOTIFICATION-TYPE      OBJECTS      { eventNbr, oldMySQLPortNumber,
newMySQLPortNumber }      STATUS      current      DESCRIPTION      "This
notification indicates that the MySQL Port has been updated. Query Server
configuration needs to be updated."      ::= {tekelecLSMSEventsVer
209 }purgeConfirmRequired NOTIFICATION-TYPE      OBJECTS      { eventNbr }
STATUS      current      DESCRIPTION      "This notification indicates that
at least one of the directly connected query server is out of sync and binary
log purging requires confirmation from the user."      ::=
{tekelecLSMSEventsVer 210 }purgeImminent NOTIFICATION-TYPE      OBJECTS
{ eventNbr, binlogsThreshold }      STATUS      current
DESCRIPTION      "This notification indicates that the disk usage is
reaching the threshold and forceful purge of binary logs is imminent."      ::=
{tekelecLSMSEventsVer 211 }resyncStartTrap      NOTIFICATION-TYPE      OBJECTS
{ lsmsUptime, sourceIP }      STATUS      current      DESCRIPTION "The trap is
sent by the LSMS to NMS when the LSMS is about to start
resynchronization"      ::= {tekelecLSMSEventsVer 212 }resyncStopTrap
NOTIFICATION-TYPE      OBJECTS      { lsmsUptime, sourceIP, resyncEventCnt,
resyncErrCode }      STATUS      current      DESCRIPTION "The trap is sent by
the LSMS to NMS when resynchronization is complete"      ::=
{tekelecLSMSEventsVer 213 }resyncRejectTrap      NOTIFICATION-TYPE      OBJECTS
{ lsmsUptime, sourceIP, resyncErrCode }      STATUS      current      DESCRIPTION
"The trap is sent by the LSMS to NMS when a resynchronization request is
rejected by LSMS "      ::= {tekelecLSMSEventsVer 214 }resyncRequiredTrap
NOTIFICATION-TYPE      OBJECTS      { lsmsUptime, sourceIP }      STATUS
current      DESCRIPTION "The trap is sent by the LSMS to NMS when the LSMS is
rebooted or LSMS is started"      ::= {tekelecLSMSEventsVer
215 }heartBeatTrap      NOTIFICATION-TYPE      OBJECTS      { lsmsUptime,
sourceIP }      STATUS      current      DESCRIPTION "The trap is sent by the
LSMS to NMS periodically to indicate that the LSMS is up"      ::=
{tekelecLSMSEventsVer 216 }lsmsAlarmTrapV3      NOTIFICATION-TYPE      OBJECTS
{ currentTime,specificOid ,sourceIP, alarmSequence,specificAlarm}      STATUS
current      DESCRIPTION "The trap will indicate that the following information
is for a perticular event"      ::= {tekelecLSMSEventsVer 217 }resyncErrCode
OBJECT-TYPE      SYNTAX      OCTET STRING      MAX-ACCESS      read-only      STATUS
current      DESCRIPTION      "errorCode = 0, Resynchronization completed
successfully.      errorCode = 1, Resynchronization aborted by
NMS.      errorCode = 2, Resynchronization already in progress for the
NMS.      errorCode = 3, Resynchronization Aborted, Database error
occurred.      errorCode = 4, Resynchronization not in
progress."      ::= { tekelecLSMSEventsVer 218 }END

```

LSMS-NAS-MIB

```

LSMS-NAS-MIB DEFINITIONS ::= BEGIN-- Copyright 2000 Tekelec
CorporationIMPORTS      enterprises      FROM RFC1155-SMI      OBJECT-TYPE
FROM RFC-1212      TRAP-TYPE      FROM RFC-1215;tekelecCorp OBJECT
IDENTIFIER ::= { enterprises 323 }tekelecPrivate      OBJECT
IDENTIFIER ::= { tekelecCorp 1 }tekelecRegistration      OBJECT
IDENTIFIER ::= { tekelecCorp 2 }tekelecGeneric      OBJECT
IDENTIFIER ::= { tekelecCorp 3 }tekelecCapabilities      OBJECT
IDENTIFIER ::= { tekelecCorp 4 }tekelecProductGroups      OBJECT
IDENTIFIER ::= { tekelecCorp 5 }tekelecRequirements      OBJECT

```

```

IDENTIFIER ::= { tekelecCorp 6 }tekelecExperimental OBJECT
IDENTIFIER ::= { tekelecCorp 7 }tekelecCallCenterGroup OBJECT
IDENTIFIER ::= { tekelecProductGroups 1 }tekelecDiagnosticsGroup OBJECT
IDENTIFIER ::= { tekelecProductGroups 2 }tekelecSwitchingGroup OBJECT
IDENTIFIER ::= { tekelecProductGroups 3 }experimental OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 1 }generic OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 2 }tekelecEAGLE OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 3 }tekelecLSMS OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 4 }tekelecOAP OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 5 }tekelecIP7 OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 6 }tekelecINSIGHT7 OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 7 }tekelecTALON OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 8 }tekelecVOX OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 9 }tekelecSCP OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 10 }tekelecIVR OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 11 }tekelecNetworkSwitch OBJECT
IDENTIFIER ::= { tekelecSwitchingGroup 12 }-- LSMS Object group sub-
tree
tekelecLSMSObjects OBJECT IDENTIFIER ::= { tekelecLSMS 1 }-- LSMS Product
Events sub-tree
tekelecLSMSEvents OBJECT IDENTIFIER ::= { tekelecLSMS 2 }--
LSMS Events Object group sub-tree
tekelecLSMSEventObjects OBJECT IDENTIFIER ::= { tekelecLSMSObjects 1 }-- LSMS SNMPv1
Event
tekelecLSMSEventsV1 OBJECT IDENTIFIER ::= { tekelecLSMSEvents
0 }
volumeNearlyFull TRAP-TYPE ENTERPRISE
tekelecLSMSEventsV1 DESCRIPTION "At least one volume is
more than 95% full. The string sent with the trap gives
the name of the volume or volumes which exceed
the threshold." ::= 212
volumeRepaired TRAP-TYPE ENTERPRISE
tekelecLSMSEventsV1 DESCRIPTION "All
volumes are now under 95% full." ::= 213
diskFailed TRAP-TYPE ENTERPRISE
tekelecLSMSEventsV1 DESCRIPTION "One or more disks failed. The trap
includes a string describing the failed disk(s)." ::= 214
diskRepaired TRAP-TYPE ENTERPRISE
tekelecLSMSEventsV1 DESCRIPTION "The failed disks have been repaired." ::=
215
END

```

The LSMS SNMP Agent Implementation

The **LSMS SNMP** agent process supports only the **SNMP** version 1 *trap* operation. The **SNMP** agent receives (through **UDP** Linux sockets) **LSMS** notification events from the following processes and formats these events into *trap* requests:

- The Surveillance process, which continually monitors the **LSMS** hardware and software.
- The **LSMS** graphical user interface (**GUI**) process.
- One or more regional agent (**npacagent**) processes, each of which receives commands from Number Portability Administration Centers (**NPACs**) and the **GUI** process, interprets those commands, and initiates appropriate **LSMS** activities to manage regional **NPAC** data. The **LSMS** can support up to eight regions; each region corresponds to an **NPAC**.
- One or more **eagleagent** processes, each of which receives commands from the **GUI** process, interprets those commands, and initiates appropriate **LSMS** activities to send data to the network elements. The **LSMS** can support up to eight pairs of network elements.
- The Local Data Manager (**supman**) process, which manages locally provisioned data that is entered through the **GUI** and sent to the network elements which the **LSMS** supports.

The **LSMS SNMP** agent formats the information received from these processes into an **SNMPv1 trap** protocol data unit (**PDU**) and sends the *trap* request to one or more **NMSs**. Each **NMS** (provided by the customer) has a local copy of the **LSMS MIB**. When the **NMS** receives a *trap* request from the **LSMS**, it compares the information in the *trap* request to information in its own **MIB** to determine what event has occurred at the **LSMS**.

For information about the format of a *trap* and which events are reported in traps, see [Automatic Monitoring of Events](#)

Configuring the SNMP Agent

If you install the optional Remote Monitoring feature, refer to the *Configuration Guide* to configure the **IP** addresses and community names for each of the **NMSs** to which you want the **LSMS** to send *trap* requests. You can also perform this procedure if you want to add or delete **NMSs** after you have started the **LSMS**. The **LSMS** can support up to five **NMSs** simultaneously.

Controlling the SNMP Agent

If the optional Remote Monitoring feature is installed, it is managed by the sentry process (`sentryd`) and can also be controlled by the user.

After the **LSMS** boots up, the sentry process (`sentryd`) constantly monitors the **LSMS SNMP** agent process. If the **SNMP** agent process exits abnormally, the sentry process (`sentryd`) restarts it.

Any user who belongs to the `lsmsadm` permission group can use the `lsmsSNMP` command to start, stop, or display status of the **LSMS SNMP** agent.

2.9.1 Stopping the SNMP Agent

Perform the following procedure to stop the **SNMP** agent process:

1. Log in to the active server as a member of the `lsmsadm` permission group.
2. To stop the **SNMP** agent, enter the following command:

```
$LSMS_DIR/lsmsSNMP stop
```

2.9.2 Starting the SNMP Agent

Perform the following procedure to start the **SNMP** agent process:

1. Log in to the active server as a member of the `lsmsadm` permission group.
2. To start the **SNMP** agent, enter the following command:

```
$LSMS_DIR/lsmsSNMP start
```

On starting services `$LSMS_DIR/lsmsSNMP start`, the following warning can be observed, which is expected and has no effect on system health or process:

```
*** WARNING : deprecated key derivation used.
    Using -iter or -pbkdf2 would be better.
    bad decrypt
    139881705285440:error:06065064:digital envelope
routines:EVP_DecryptFinal_ex:bad decrypt:crypto/evp/evp_enc.c:643:
*** WARNING : deprecated key derivation used.
    Using -iter or -pbkdf2 would be better.
    bad decrypt
```

```

140245827839808:error:06065064:digital envelope
routines:EVP_DecryptFinal_ex:bad decrypt:crypto/evp/evp_enc.c:643:
Error: passphrase chosen is below the length requirements of the
USM (min=8).
1 at /usr/TKLC/lsmss/bin/supDB.pm line 2076.

```

2.9.3 Determining the Status of the SNMP Agent

Perform the following procedure to determine the status of the **SNMP** agent process:

1. Log in to the active server as a member of the `lsmssadm` permission group.
2. To retrieve the status of the **SNMP** agent, enter the following command:

```
$ $LSMS_DIR/lsmssSNMP status
```

Output similar to the following appears:

```

Checking the status of the LSMS SNMP Agent...
LSMS SNMP agent is running.
LSMS SNMP AGENT PROCESS STATUS

```

```
TOTAL SUCCESSFUL TRAP REQUEST = 2926
```

```
TOTAL FAILED TRAP REQUEST = 0
```

```
== IP-ADDRESS == == STATUS ==
```

```

SNMP SESSION ESTABLISHED 10.250.54.19
finish

```

```
LSMS SNMP Resync is running.
```

```
LSMS Heartbeatsender is running.
```

This output provides the following information:

- A title line to indicate that the output is **LSMSSNMP** agent process status
- The total number of successful **SNMP** trap requests sent by the **LSMSSNMP** agent since it started
- The total number of failed **SNMP** trap requests sent by the **LSMSSNMP** agent since it started
- The status of each **UDP** socket session to an **NMS**, along with the **IP** address of the **NMS**:
 - Failed indicates that an SNMP session was never established
 - SNMP Session Established indicates that the session was successfully established

2.9.4 Logging SNMP Agent Actions

When the **LSMS SNMP** agent process starts, stops, or sends a *trap* request, it logs information about the action in a log file. The log file is named `lsmssSNMP.log<MMDD>`, where `<MMDD>`

represents the current month and day. The log file is stored in the directory `/usr/TKLC/lsmss/logs/snmp` and is automatically deleted after 7 days. If either the log file or its directory does not already exist, the agent process creates the file or the directory, or both, when one of these actions occurs.

The log file has a maximum size of 5 MB. After the log is completely filled, its contents are copied to a backup file `lsmssSNMP.log.backup` in the same directory, and actions are logged from the beginning of a fresh `lsmssSNMP.log` file.

For more information about what is logged in this file, see “[Logging SNMP Agent Actions](#)”.

2.10 Configuring the SNMP Agent

To configure trap forwarding, follow these general steps:

1. Set the SNMP global mode as needed.
See [SNMP Global Mode](#).

If the **SNMPv1 ONLY** mode is set, skip to step 5.

Note:

SNMPv1 provides no authentication and no privacy.

2. Configure SNMPv3 views.
See [SNMPv3 Access View Management](#).
3. Configure one or more SNMPv3 groups that use the SNMPv3 views.
See [SNMPv3 Group Management](#).
4. Configure SNMPv3 users associated with the SNMPv3 groups.
See [SNMPv3 User Management](#).
5. Configure the NMS on LSMS.
See [NMS Configuration](#).
6. Configure the NMS.
To see what was configured in step 5, use **SNMP Configuration**, and then **NMS Configuration**, and then **Show**.

2.11 SNMP Global Mode

LSMS supports three SNMP global modes:

- **SNMPv1 ONLY**
- **SNMPv3 ONLY**
- **Both**

By default after a fresh installation or upgrade/re-installation, LSMS supports only the **SNMPv3 ONLY** global mode. SNMPv3 trap forwarding is recommended because of the encryption and secured authentication mechanisms provided.

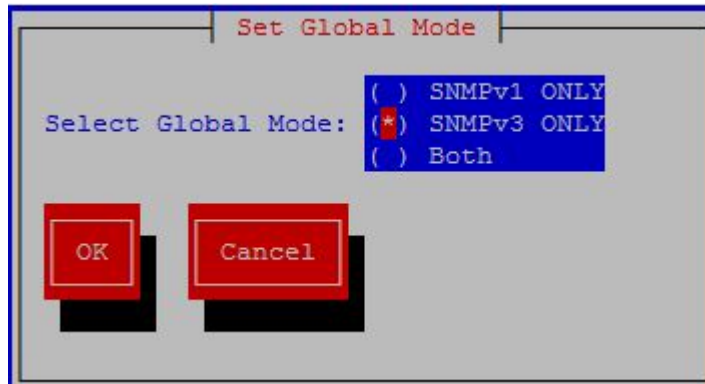
For SNMPv1 trap forwarding, you can choose to change the SNMP global mode setting to **Both** or **SNMPv1 ONLY**.

**Note:**

SNMPv1 provides no authentication and no privacy.

The lsmsmgr user can change the SNMP global mode setting via menu option **SNMP Configuration**, and then **SNMP Global Mode**, and then choosing the **Edit** button. The following screen is displayed:

Figure 2-8 Set Global Mode



Following are details on the SNMP global modes:

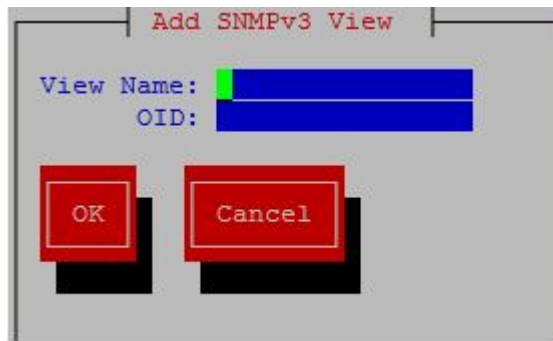
- **SNMPv1 ONLY**
Selecting this mode results in LSMS supporting only SNMPv1 as follows:
 - LSMS will forward SNMPv1 traps to only NMS(s) configured to support SNMPv1.
 - LSMS will allow addition of any new NMS that supports SNMPv1, and will not allow modification of an existing SNMPv1-based NMS to SNMPv3.
 - Prior to changing the mode to **SNMPv3 ONLY**, any NMS(s) configured (as in [NMS Configuration](#)) to support SNMPv1 must be removed.
- **SNMPv3 ONLY (recommended mode)**
Selecting this mode results in LSMS supporting only SNMPv3 as follows:
 - LSMS will forward SNMPv3 traps to only NMS(s) configured to support SNMPv3.
 - LSMS will allow addition of any new NMS that supports SNMPv3, and will not allow modification of an existing SNMPv3-based NMS to SNMPv1.
 - Prior to changing the mode to **SNMPv1 ONLY**, any NMS(s) configured (as in [NMS Configuration](#)) to support SNMPv3 must be removed. Changing the mode to **SNMPv1 ONLY** is not recommended.
- **Both**
Selecting this mode results in LSMS supporting both SNMPv1 and SNMPv3 as follows:
 - LSMS will forward traps to all NMS(s) configured to support SNMPv1 or SNMPv3.
 - LSMS will allow addition of any new NMS that supports SNMPv1 or SNMPv3.
 - LSMS will allow update of any NMS that supports SNMPv1 or SNMPv3.
 - Prior to changing the mode to **SNMPv3 ONLY**, any NMS(s) configured (as in [NMS Configuration](#)) to support SNMPv1 must be removed.

- Prior to changing the mode to **SNMPv1 ONLY**, any NMS(s) configured (as in [NMS Configuration](#)) to support SNMPv3 must be removed. Changing the mode to **SNMPv1 ONLY** is not recommended.

2.12 SNMPv3 Access View Management

To support view-based access control for SNMPv3, LSMS provides the **SNMP Configuration**, and then **SNMPv3 View Configuration**, and then **Add/Delete/Edit/Show** menu options. These menu options are accessible only when the SNMP Global Mode is set to **SNMPv3 ONLY** or **Both**. Following is an example of the **Add** menu.

Figure 2-9 Add SNMPv3 View Screen



The **SNMP Configuration**, and then **SNMPv3 View Configuration** submenus include fields for the **View Name** and the **OID** of the associated LSMS MIB object.

View names must be unique, 1 - 32 alphanumeric characters in length, and are case sensitive. The OID associated with a view is mandatory.

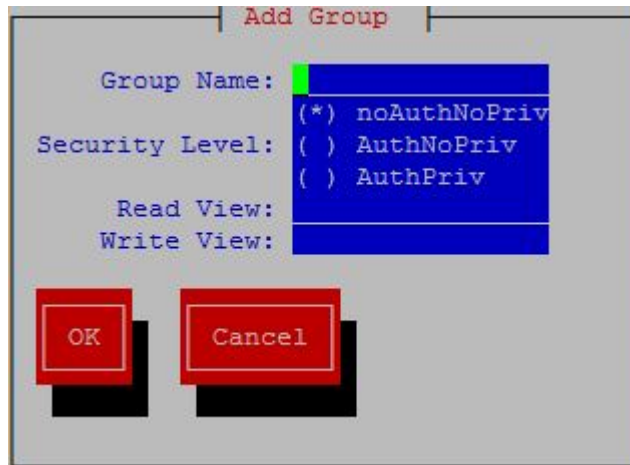
The **resyncVar** object with OID 1.3.6.1.4.1.323.5.3.4.1.1.45 is the only object available in the LSMS MIB for read/write operations by a NMS. By default, LSMS provides a view named **resyncVarView** that is sufficient for controlling read/write access to the **resyncVar** object. The **resyncVarView** cannot be modified or deleted. Use of another OID for view configuration is not restricted.

A view that is associated to any group cannot be deleted. For information about groups, see [SNMPv3 Group Management](#).

2.13 SNMPv3 Group Management

To support user-based security for SNMPv3, LSMS provides the **SNMP Configuration**, and then **Group Configuration**, and then **Add/Delete/Edit/Show** menu options. These menu options are accessible only when the SNMP Global Mode is set to **SNMPv3 ONLY** or **Both**. Following is an example of the **Add** menu.

Figure 2-10 Add Group Screen

The image shows a dialog box titled "Add Group". It contains four labels: "Group Name:", "Security Level:", "Read View:", and "Write View:". The "Security Level:" label has a dropdown menu open, showing three options: "(*) noAuthNoPriv", "() AuthNoPriv", and "() AuthPriv". The "Group Name:" label has a green cursor. At the bottom of the dialog box are two red buttons: "OK" and "Cancel".

The **Group Name** must be unique, 1 - 32 alphanumeric characters in length, and is case sensitive.

The **Security Level** is mandatory. Valid values are **noAuthNoPriv**, **AuthNoPriv**, and **AuthPriv** as shown in [Table 2-6](#).

Table 2-6 SNMPv3 Security Levels

Level	Authentication	Encryption	Details
noAuthNoPriv (no authentication, no privacy)	Username	No	Uses a username match for authentication
AuthNoPriv (authentication, no privacy)	Yes (SHA)	No	Provides authentication based on the algorithms available in the net-snmp API
AuthPriv (authentication and privacy)	Yes (SHA)	Yes (DES/AES)	Provides authentication and encryption based on the algorithms available in the net-snmp API

The **Read View** name is optional, and must be specified exactly as configured in the view. The specified view must already be configured to be added to the group. If a read view is not selected for a group, the group will not have read access to any of the LSMS MIB objects.

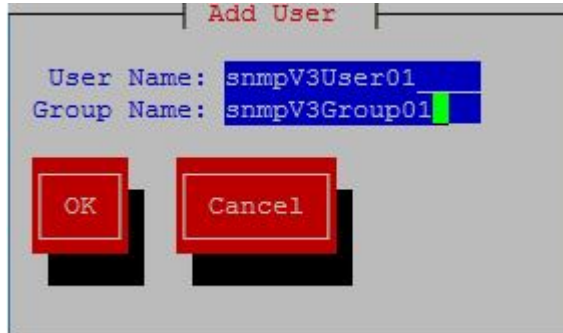
The **Write View** name is optional, and must be specified exactly as configured in the view. The specified view must already be configured to be added to the group. If a write view is not selected for a group, the group will not have write access to any of the LSMS MIB objects.

A group that is associated with any user cannot be deleted. For information about users, see [SNMPv3 User Management](#).

2.14 SNMPv3 User Management

To support user-based security for SNMPv3, LSMS provides the **SNMP Configuration**, and then **User Configuration**, and then **Add/Delete/Edit/Show** menu options. These menu options are accessible only when the SNMP Global Mode is set to **SNMPv3 ONLY** or **Both**. Following is an example of the initial **Add** menu.

Figure 2-11 Initial Add User Screen



The screenshot shows a terminal window titled "Add User". It contains two input fields: "User Name:" with the value "snmpV3User01" and "Group Name:" with the value "snmpV3Group01". Below the fields are two red buttons labeled "OK" and "Cancel".

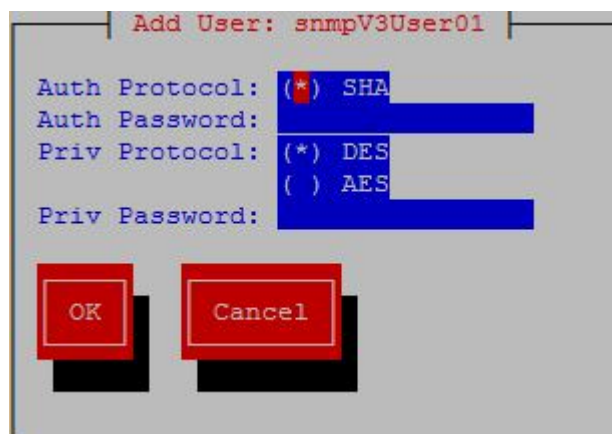
The **User Name** must be unique, 1 - 50 alphanumeric characters in length, and is case sensitive.

The **Group Name** must be already configured to be specified for a user, and must exactly match (case sensitive) a configured group name.

After specifying valid values for the **User Name** and **Group Name** and selecting **OK**, display of another screen depends on the security level configured for the specified group:

- If the security level configured for the specified group is **noAuthNoPriv**, user configuration is complete.
- If the security level configured for the specified group is **AuthNoPriv** or **AuthPriv**, a second screen is displayed containing the configured security fields for the specified group. Following is an example for a group having the AuthPriv security level:

Figure 2-12 Add User Screen for AuthPriv



The screenshot shows a terminal window titled "Add User: snmpV3User01". It contains four input fields: "Auth Protocol:" with a radio button selected for "SHA", "Auth Password:" with a blue bar, "Priv Protocol:" with a radio button selected for "DES" and an unselected radio button for "AES", and "Priv Password:" with a blue bar. Below the fields are two red buttons labeled "OK" and "Cancel".

 Note:

When the security level configured for the specified group is **AuthNoPriv**, input fields **Priv Protocol**, and **Priv Password** will not be displayed.

Select or specify the **Auth Protocol**, **Auth Password**, **Priv Protocol**, and **Priv Password** fields as needed:

- The default and only valid value for **Auth Protocol** is **SHA**.
- Valid values for **Priv Protocol** are **DES** and **AES**.
- The **Auth Password** and **Priv Password** fields must be 8 - 255 characters in length. Valid characters include alphanumeric characters and the following special characters:

@

\$
!

The **Auth Password** and **Priv Password** fields are encrypted in the database.

A user that is associated with any NMS cannot be deleted. For information about associating a user with an NMS, see [NMS Configuration](#).

2.15 NMS Configuration

To configure the NMS with which LSMS will interact to send alarms, LSMS provides the **SNMP Configuration**, and then **NMS Configuration**, and then **Add/Delete/Edit/Show** menu options. The specific screen/submenu displayed depends upon the SNMP global mode set in [SNMP Global Mode](#) (the default mode is **SNMPv3 ONLY**).

The following fields are common to all modes:

Name

The **Name** is a unique logical name for the NMS server consisting of 5 - 20 alphanumeric, case-sensitive characters. The **Name** is mandatory for SNMPv3 configuration and optional for SNMPv1 configuration.

IP

The **IP** must be non-empty and unique.

Port

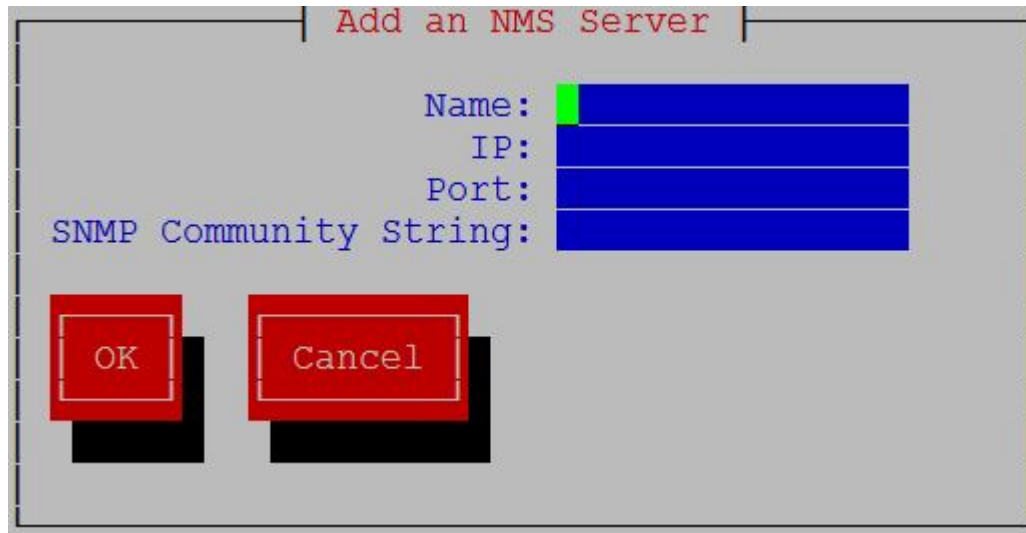
The **Port** must be a valid value in the range 1 - 65535, excluding the pre-defined ports.

For the **SNMPv1 ONLY** mode, in addition to the common fields, the **SNMP Community String** field is also displayed. The **SNMP Community String** is mandatory and consists of 1 - 127 alphanumeric characters or the following special characters:

@

\$
!

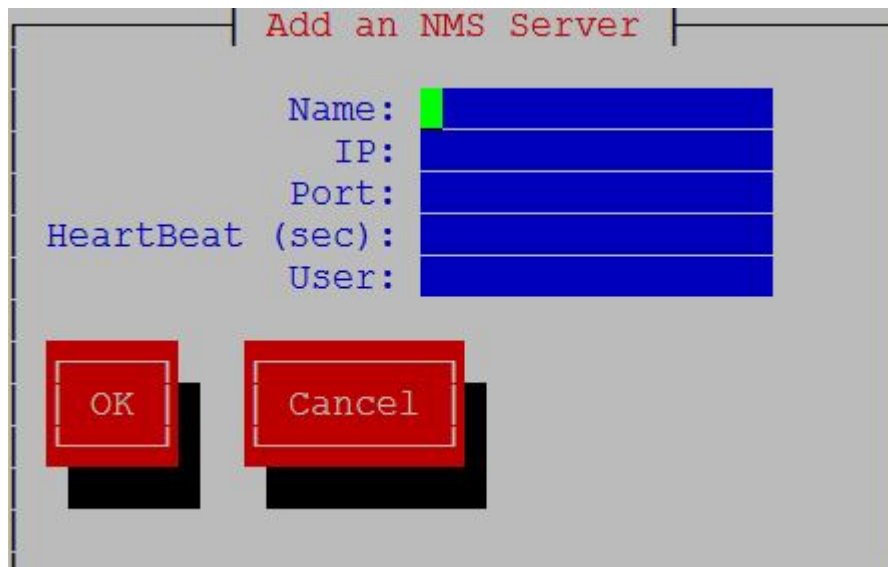
Figure 2-13 Add an NMS Server Screen for SNMPv1 ONLY



The community string is stored in encrypted form in the database.

For the **SNMPv3 ONLY** mode, in addition to the common fields, the **HeartBeat (sec)** and **User** fields are also displayed.

Figure 2-14 Add an NMS Server Screen for SNMPv3 ONLY



Valid values for the **HeartBeat (sec)** field are 0 or between 5 - 7200, with a default value of 60.

The **User** field is mandatory, and must be specified exactly (case sensitive) as previously configured (see [SNMPv3 User Management](#)).

If the SNMP Global Mode is **Both**, all previous fields are displayed along with the **SNMP Version** field. Either **v3** or **v1** must be selected for **SNMP Version**.

Figure 2-15 Add an NMS Server Screen for Both

The screenshot shows a window titled "Add an NMS Server". Inside, there are several labeled input fields: "Name:" (with a green cursor), "IP:", "Port:", "SNMP Version:" (with radio buttons for "(*) v3" and "() v1", where v3 is selected), "HeartBeat (sec):", "SNMP Community String:", and "User:". At the bottom left are two red buttons labeled "OK" and "Cancel".

When the SNMP Global Mode is **Both**, the **SNMP Community String** and **User** fields are mutually exclusive. The **HeartBeat (sec)** field is applicable only for SNMPv3.

Run the following command to restart TKLCSnmp services

```
# systemctl restart TKLCSnmp
```

2.16 Autonomous Events Trap Forwarding

The LSMS SNMP agent forwards all autonomous events generated at the LSMS, in the form of SNMPv1 traps to an NMS configured for SNMPv1 or SNMPv3 traps to an NMS configured for SNMPv3. A circular queue is maintained to support asynchronized trap requests so that traps are not missed if an NMS is disconnected from LSMS for any reason.

Trap forwarding from LSMS to an SNMPv3-based NMS is the same as to an SNMPv1-based NMS, except for the following:

- A new varbind **currentTime** is introduced in the LSMS MIB to indicate the time when an alarm was generated.
- A new varbind **sourceIp** is introduced in the LSMS MIB to include the source IP address of the network element in traps.
- A new varbind **alarmSequence** is introduced in the LSMS MIB to maintain a sequence number with traps. The minimum sequence number value is 1 and the maximum value is 4294967295, after which the value will roll over.
- The trap PDU includes additional information related to the USM entry for the NMS.
- LSMS sends heartbeat traps to an NMS periodically to indicate that the connection is still up. The periodicity of the heartbeat trap is the **HeartBeat (sec)** value configured for the NMS.

2.17 Resynchronization

The MIB element **resyncVar** is supported and its value used to coordinate the alarm resynchronization process. The value is set to 1 to start resynchronization. Get and set operations are allowed only for resyncVar.

2.18 Connectivity between LSMS and NMS

LSMS listens at SNMP agent standard port 161 for Get/Set messages. When a Get/Set message is received, LSMS checks the Set message for validity (whether the v3 user that sent the Set request for resyncVar is valid and has permission to set the variable). If the request is valid, resyncVar is set and thereafter the alarm resynchronization mechanism (including error scenarios) between LSMS and the v3-based NMS will start.

3

Routine Procedures

This chapter explains the procedures that system administrators regularly perform. These procedures include establishing remote login procedures, starting up and shutting down the **LSMS** system, setting the system clock, and managing user accounts.

3.1 Introduction

This chapter explains the procedures that system administrators regularly perform. These procedures include establishing remote login procedures, starting up and shutting down the **LSMS** system, setting the system clock, and managing user accounts.

The procedures in this chapter assume that you are familiar with the **LSMS** hardware. For more information about the hardware, refer to *Application B Card Hardware and Installation Guide*.

3.2 Using Login Sessions

Login sessions are used for the following user functions:

- To use the command line for any of the following functions:
 - To access the `lsmsmgr` text interface, which is used for configuring and maintaining the **LSMS** system
 - To enter **LSMS** commands (generally used for managing **LSMS** applications); for more information, see [Commands](#)
- To use the graphical user interface (**GUI**), which is generally used for the following functions:
 - Configuration (for more information, refer to *Configuration Guide*)
 - **Database** administration (for more information, refer to the *Database Administrator's Guide*)
 - Synchronization of the **LSMS LNP** database with the **LNP** databases at network elements (for more information, refer to *LNP Database Synchronization User's Guide*)

Support of Multiple Users

The **LSMS** allows, as a standard feature, a maximum of eight simultaneous users. The Support for Additional Users optional feature enables you to have a maximum of 25 simultaneous users. A user is defined to be any of the following:

- `lsmsmgr` user (a user who logs in as the `lsmsmgr` user to start the `lsmsmgr` text interface)
- Web-based **GUI** user (a user who has logged into the active server **GUI** over the web; this function requires the **IP** User Interface optional feature)
- `lsmsclaa` user (a user who is using the optional **LSMSCommand Class** Management optional feature)

Establishing Login Sessions

From any network-connected terminal, you can establish a variety of sessions with the active server or with a specific server in one of the following ways:

- Display the `lsmsmgr` text interface of either the active server or of a specific server.
- Display the command line of either the active server or a specific server for entering commands; see [Logging In to LSMS Server Command Line](#).
- Display the **GUI** remotely (if the optional **IP** User Interface feature is installed) by using a web browser; see [Starting a Web-Based LSMS GUI Session](#).

3.2.1 Logging In to LSMS Server Command Line

You can log into the **LSMS** active server or into a specific server from any terminal that has a **Secure Shell** (`ssh`) client installed.



Note:

If your terminal does not already have `ssh` installed, PuTTY (Oracle does not make any representations or warranties about this product) is an open source `ssh` utility for Windows that you can download from the web.

You must have a user **ID** and password before you can log in to **LSMS**.

1. From a command-line prompt on a Windows-based or Linux-based terminal, enter one of the following commands (depending on the terminal operating system) to start a secure shell session with the **LSMS** server:

```
ssh -X <username>@<server_IP_address>
```

For `<username>` and `<server_IP_address>`, specify values shown in [Table 3-1](#) that are appropriate to the procedure you are performing:

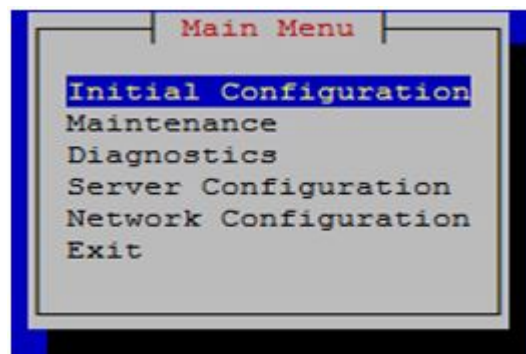
Table 3-1 Parameters Used in Accessing Server Command Line

Parameter	Value
<code><username></code>	Use one of the following: • <code>lsmsmgr</code> to access the <code>lsmsmgr</code> text interface for configuration, diagnostics, and other maintenance functions • <code>syscheck</code> to run the <code>syscheck</code> command with no options, which returns overall health checks and then exits the login session (for more information about the <code>syscheck</code> command, see syscheck) • Other user names, as directed by a procedure

Table 3-1 (Cont.) Parameters Used in Accessing Server Command Line

Parameter	Value
<server_IP_address>	Use one of the following: • Virtual IP address (VIP) to access the LSMS Web GUI • IP address of the specific server, when directed by a procedure to access a particular server

2. When prompted, enter the password associated with the user name.
3. You can now continue with any of the following functions:
 - If you entered `lsmsmgr` as the username, the `lsmsmgr` text interface displays. You can use any of the `lsmsmgr` functions.

Figure 3-1 Lsmsmgr Text Interface Main Menu **Note:**

Selections in the `lsmsmgr` text interface are made by either using the Up and Down Arrow keys on your keyboard or typing the first letter of any menu item to change which menu item is highlighted. When the desired menu item is highlighted, press the Enter key.

In this manual, menu selections are indicated as a series; for example, select **Maintenance**, and then **Start Node** indicates that you should highlight the Maintenance item on the main menu, press Enter, then highlight the Start Node item on the next menu, and press Enter.

- If you entered `syscheck` as the username, the command line window displays the System Health Check output. For more information about `syscheck`, see [syscheck](#).
- If you entered any other username the command line prompt displays a prompt that shows the username and host name, similar to the following example (in this example, the user logged in as the `lsmsadm` user to the server whose host name is `lsmspri`):
`[lsmsadm@lsmspri lsmsadm] $`

 Note:

In this manual, the prompt will be indicated simply by `$`.

LSMS commands can be entered at this prompt. If you need to start an LSMS GUI session, see [Starting a Web-Based LSMS GUI Session](#).

3.2.2 Logging in from One Server to the Mate's Command Line

Sometimes it may be necessary to have access to the command line interfaces for both servers. You can log into each server separately using `ssh`, or you can use `ssh` to go back and forth between servers.

To log in from one server's command line to the mate server's command line, use the following procedure:

1. Log in as any user except `lsmsmgr` or `syscheck`, using the procedure described in ["Logging In to LSMS Server Command Line"](#) to log into a server command line.
2. Enter the following command to access the command line on the mate server:

```
$ ssh mate
```

If you have not previously logged into the mate, the following information displays:

```
The authenticity of host 'mate (192.168.1.1)' can't be established.
RSA key fingerprint is 1c:14:0e:ea:13:c8:68:07:3d:7c:4d:71:b1:0c:33:04.
Are you sure you want to continue connecting (yes/no)?
```

Type `yes`, and press **Enter**.

3. When prompted, enter the password for the same user name.
4. The prompt on your terminal now displays the host name of the mate server, and you can enter commands for the mate server.

Following is an example of the sequence of commands and prompts that display during this procedure:

```
[lsmsadm@lsmspri lsmsadm]$ ssh mate
lsmsadm@mate's password:
[lsmsadm@lsmssec lsmsadm]$
```

3.2.3 Starting a Web-Based LSMS GUI Session

The **LSMS** offers, as the optional **IP** User Interface feature, a web-based graphical user interface (**GUI**) intended for remote users. The web-based **GUI** can be run:

- On a **PC** with Microsoft® Windows installed, using Microsoft Internet Explorer (version 8.0, 9.0, 10.0, or 11.0)
A 32-bit installation of Windows uses 32-bit Internet Explorer and 32-bit Java. A 64-bit installation of Windows includes both the 32-bit and 64-bit Internet Explorer. If you are using the 32-bit Internet Explorer, 32-bit Java is required, and if you are using the 64-bit

Internet Explorer, 64-bit Java is required. You can check the Internet Explorer version by clicking on **Tools**, and then **About Internet Explorer**. If 64-bit Edition is displayed as shown in the following example, you are using the 64-bit edition. If 64-bit Edition is not displayed, you are using the 32-bit edition.

 Note:

You can open the LSMS GUI regardless of the Java version by commenting the following in the `java.security` file in case of any occurrences of `jdk.jar.disabledAlgorithms`:

```
#jdk.jar.disabledAlgorithms=MD2, MD5, RSA keySize < 1024, \  
# DSA keySize < 1024, include jdk.disabled.namedCurves,\  
# SHA1 denyAfter 2019-01-01
```

Figure 3-2 Windows Internet Explorer



- On a Linux workstation, using Mozilla® Firefox® 3.0.0 or later

The web-based **GUI** is accessible from any machine that can access the network on which the **LSMS** resides. The functionality of the web-based **GUI** is the same as that of the server-side **GUI**.

**Note:**

When you have completed logging into the web-based **LSMS GUI**, the session has these operating characteristics:

- Pressing the Back button from the browser from which the **GUI** was launched terminates that **GUI** session. To reopen the **GUI**, you must click the Refresh button and begin the login process again.
- Pressing the Refresh button from the browser from which the **GUI** was launched terminates that **GUI** session. To reopen the **GUI**, you must begin the login process again.
- You cannot use a browser window that was started by selecting File > New > Window from the browser window to launch another web-based **LSMS GUI** session.
- If the GUI is idle for an extended period, you may receive `Server not responding` or `Invalid Session ID` errors; close the existing GUI session and start a new GUI session.

The HTTPS support on LSMS feature allows you to configure the protocol(s) used for the GUI:

- Secure Hypertext Transfer Protocol (HTTPS)
- Hypertext Transfer Protocol (HTTP)
- Both HTTPS and HTTP

Both HTTPS and HTTP are enabled by default. HTTPS supports encryption of data exchanged between the web server and the browser, thus facilitating data privacy. HTTP is not encrypted/secure, allowing data to be captured by any network analyzer and viewed.

A script (`/usr/TKLC/lsms/bin/httpConfig.pl`) is provided to toggle between protocols or to check what is currently enabled. The script can be run by the `lsmsadm` user with one of the following parameters:

https

Results in HTTPS being enabled and HTTP being disabled.

http

Results in HTTP being enabled and HTTPS being disabled.

both

Results in both HTTPS and HTTP being enabled. This is the default.

status

Displays whether HTTPS and HTTP are enabled or disabled.

**Note:**

- After changing the protocol, the GUI must be refreshed to reflect the changes. A GUI notification will be displayed.
- ```
#jdk.jar.disabledAlgorithms=MD2, MD5, RSA keySize < 1024, \
DSA keySize < 1024, include jdk.disabled.namedCurves,\
SHA1 denyAfter 2019-01-01
```

To start the web-based **GUI**, verify that the **IP** User Interface feature has been activated and, perform the following procedure:

1. Start your web browser (Mozilla® Firefox® or Internet Explorer).
2. Specify https or http followed by the **LSMS** Virtual **IP (VIP)** address in the Location: or Address: field, or the application VIP in a segmented network. For http, add :8200.
  - https://<VIP\_address>
  - http://<VIP\_address>:8200

The <VIP\_address> is the Virtual **IP** address used by your **LSMS** system. (The **VIP** address is always associated with the active server; when switchover occurs, the **VIP** address association is switched over from previously active server to the newly active server.)

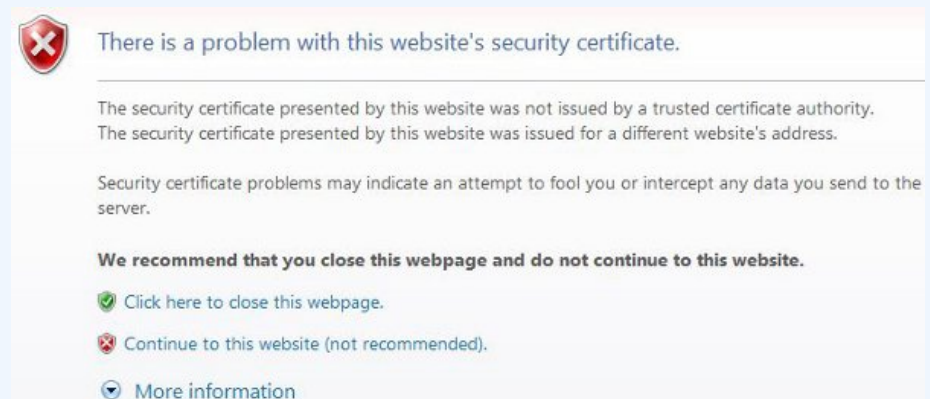
3. Press **Return** and the Oracle Communications **LSMS** start page is displayed.

 **Note:**

If using HTTPS, you must click through some security warnings that are displayed, which differ depending on the browser in use:

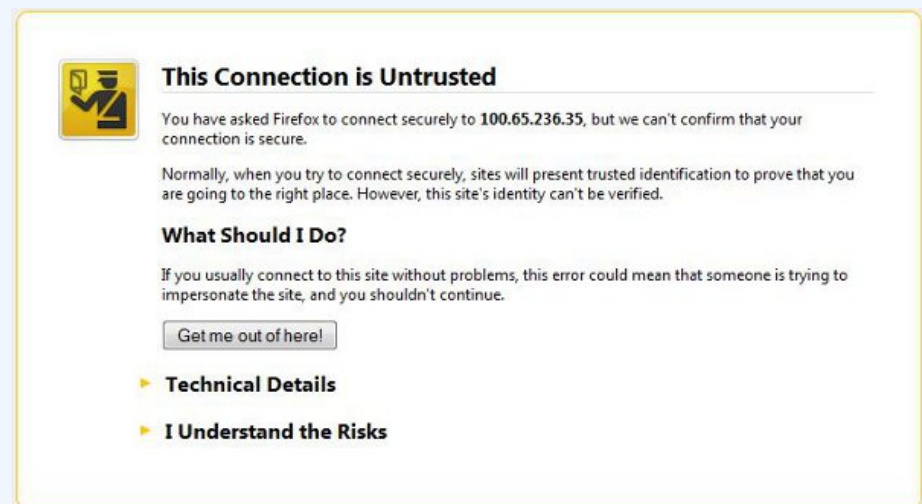
- For Internet Explorer, click on **Continue to this website** (not recommended) on the following screen:

**Figure 3-3 Problem with Security Certificate**



- For Mozilla Firefox, click on **I Understand the Risks** on the following screen:

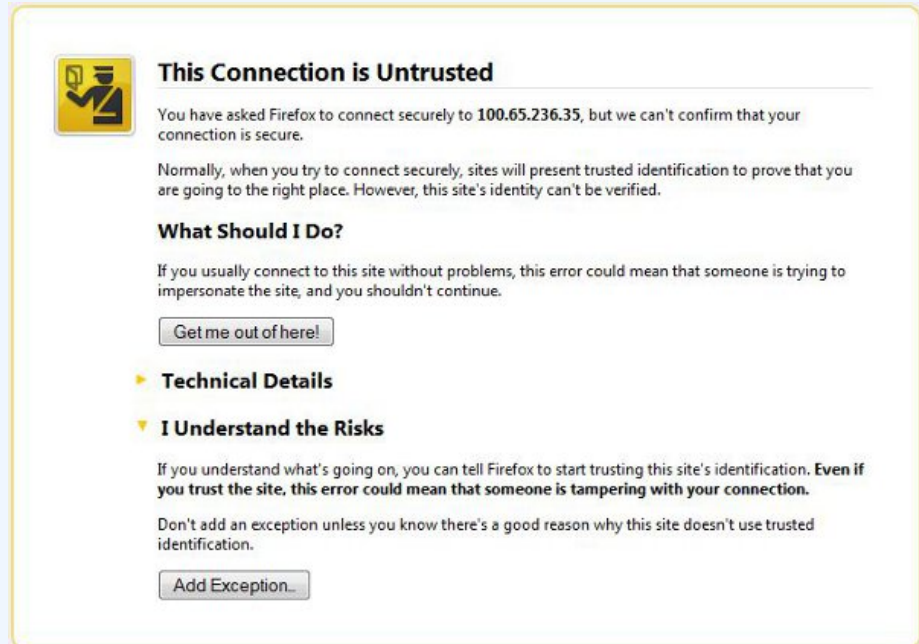
**Figure 3-4 Connection is Untrusted**



Then click on **Add Exception** on the following screen:



Figure 3-5 Connection is Untrusted (continued)



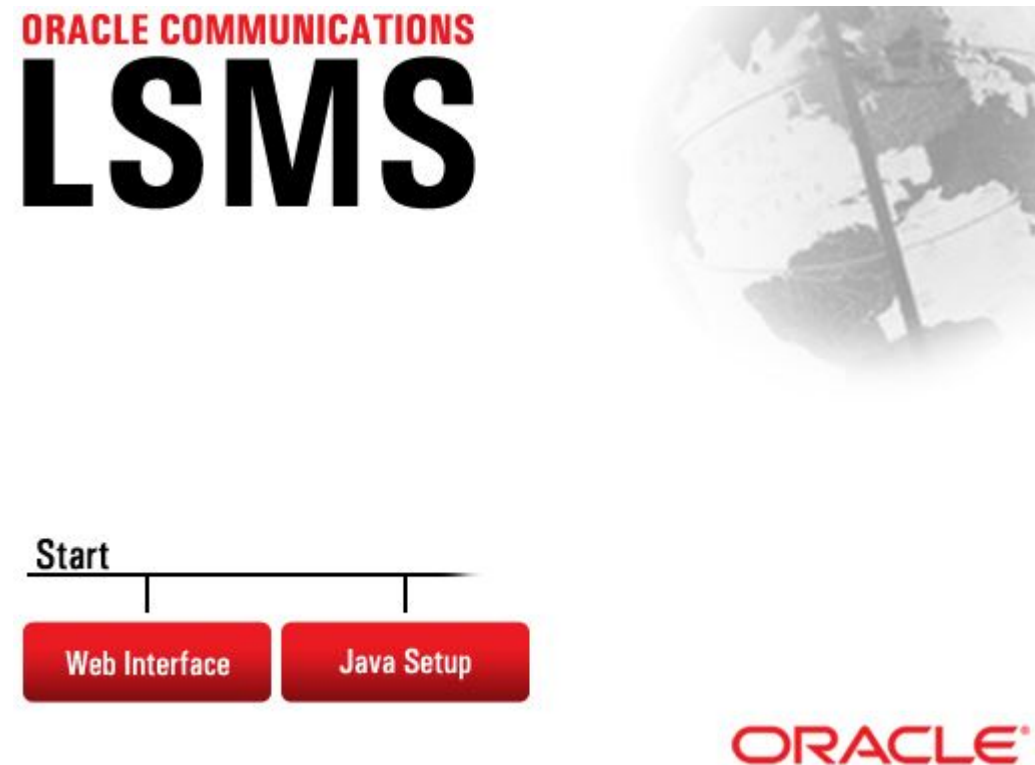
Then enter the site in the Location field and click on `Confirm Security Exception`:

Figure 3-6 Add Exception for Untrusted Connection



The Oracle Communications **LSMS** start page displays:

Figure 3-7 Oracle Communications LSMS Start Page

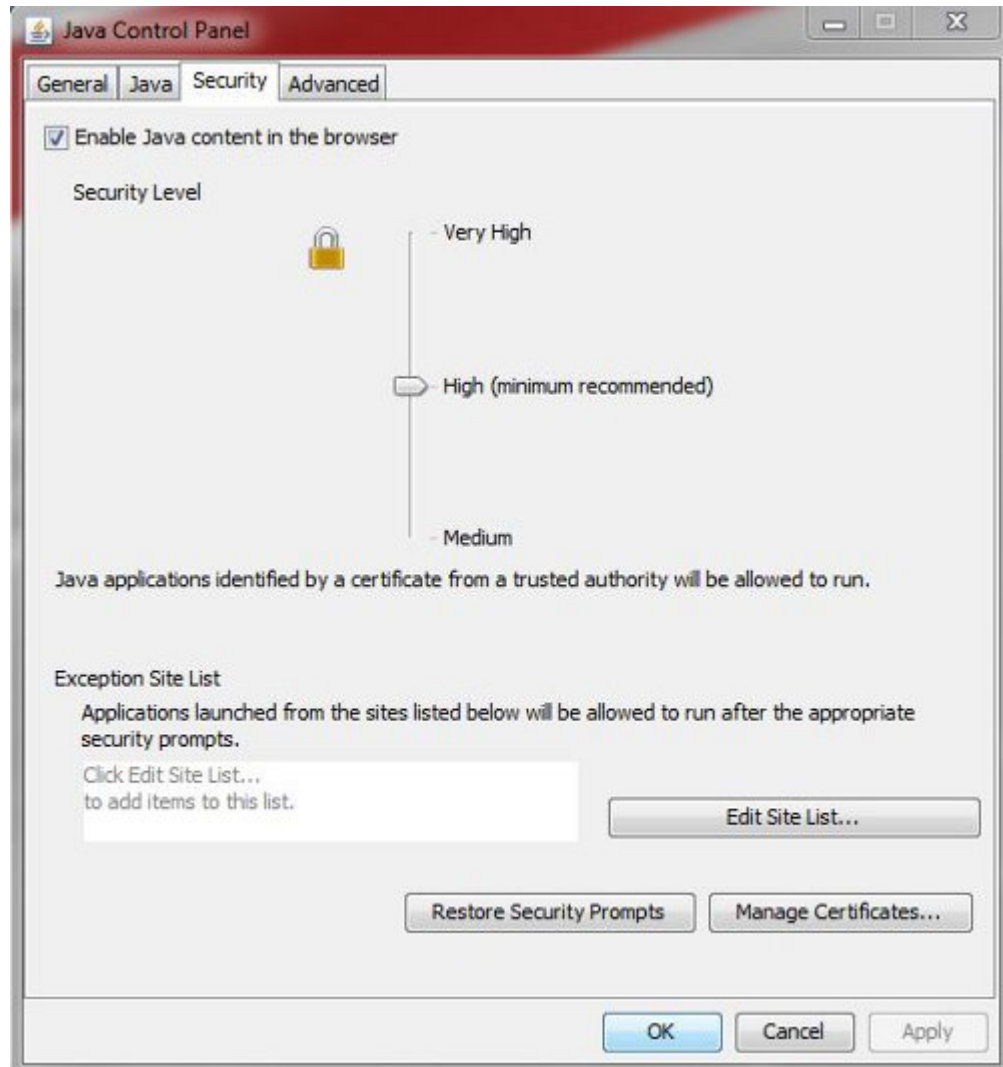


4. If you are logging in for the first time from this terminal, click the **Java Setup** button and follow the instructions on the displayed page to install a Java plug-in and set up a security policy.  
Otherwise, go to step 5.
5. Open the Java Control Panel for your terminal, go to the **Security** tab as shown in [Figure 3-8](#), and click on **Edit Site List**.

 **Note:**

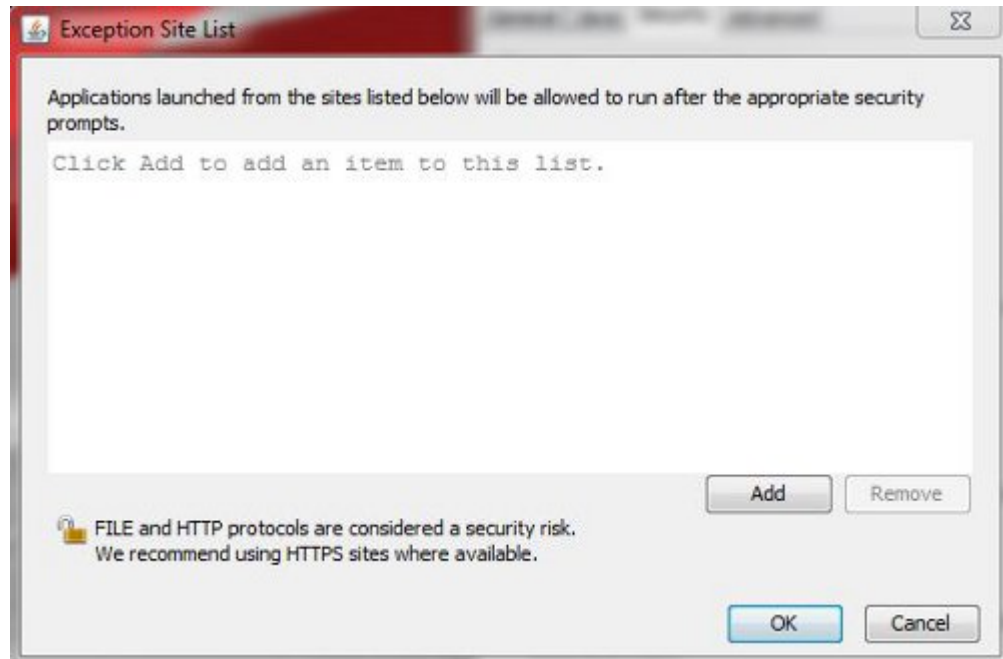
- The actual screens displayed might differ from these examples depending upon the specific Java version in use.
- If using both https and http, both must be added to the exception site list (https://<VIP\_address> and http://<VIP\_address>:8200).

Figure 3-8 Security Tab of Java Control Panel



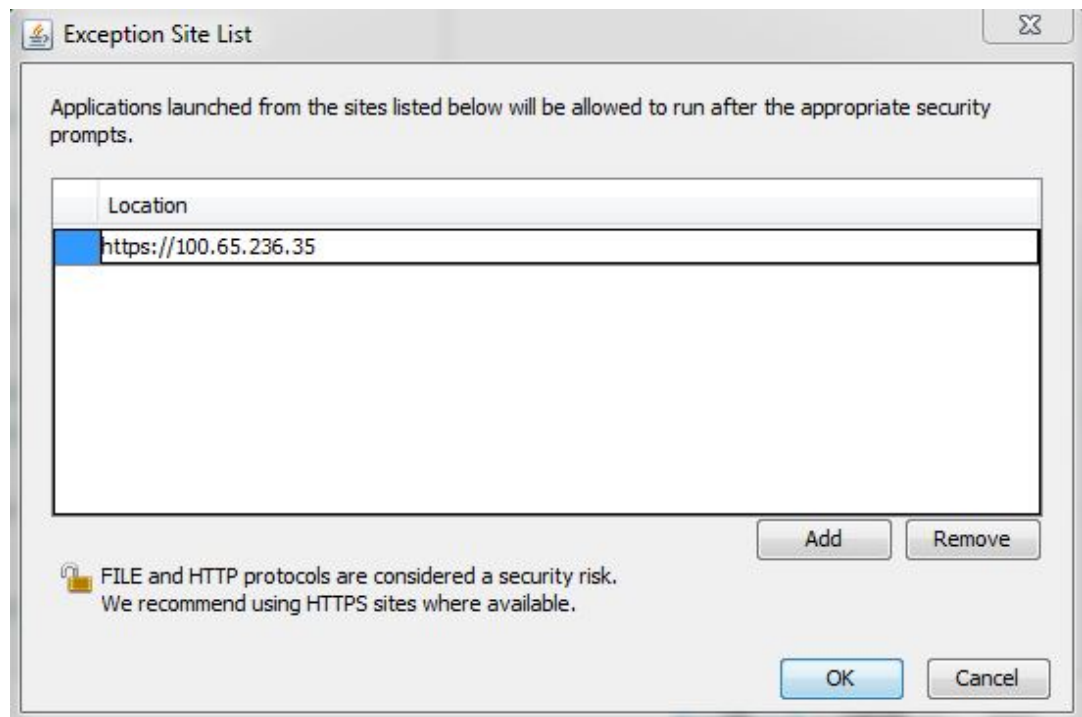
6. After clicking on **Edit Site List**, click on **Add**:

**Figure 3-9 Adding to the Exception Site List**



7. Type in the location of your LSMS server (`https://IP_address` or `http://IP_address:8200`):

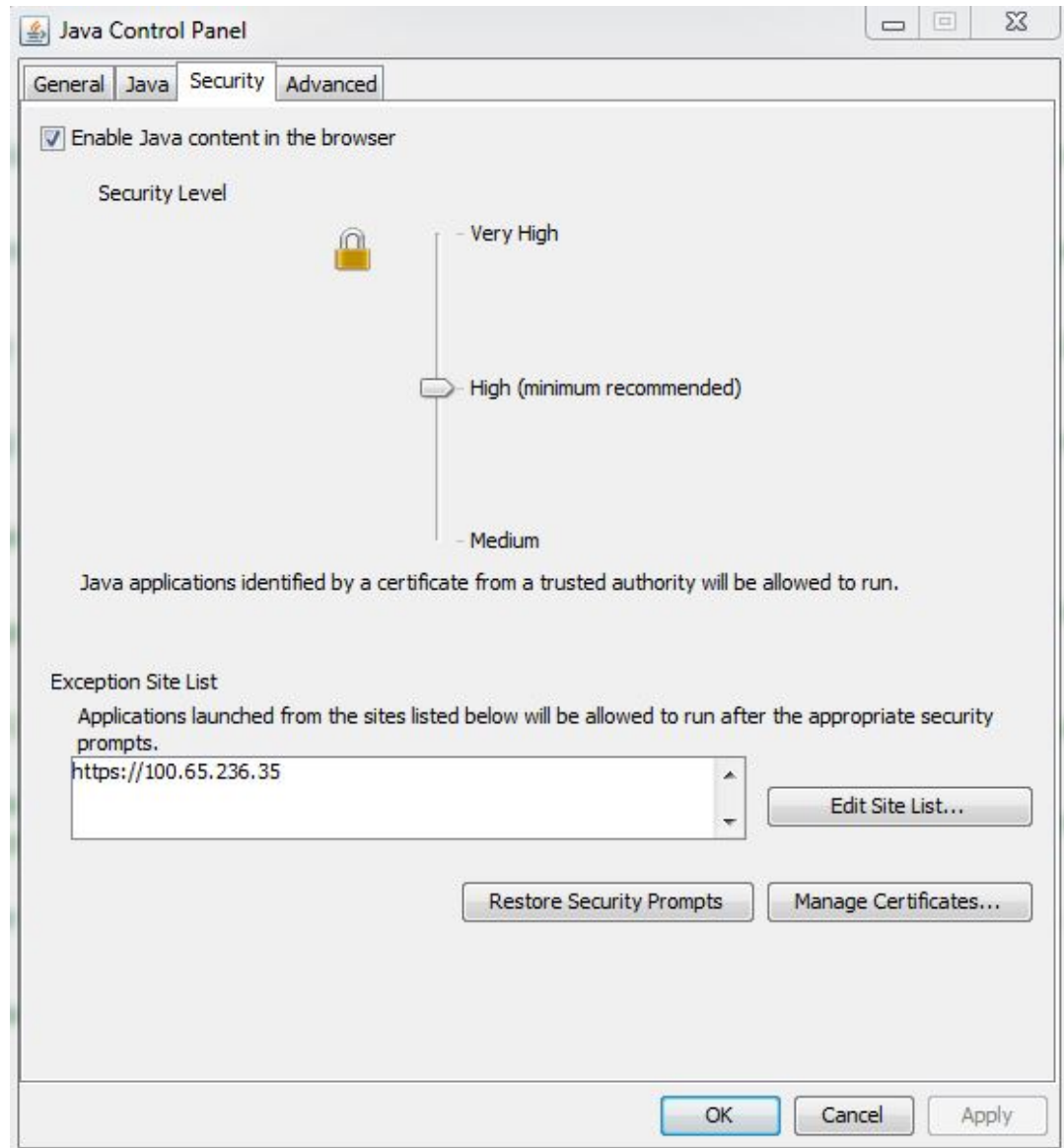
**Figure 3-10 Adding the LSMS Server to the Exception Site List**



8. Click **OK**.

The **Security** tab will now show the server in the Exception Site List, as shown in the following example:

**Figure 3-11** Exception Site List Including the LSMS Server



 **Note:**

If you are adding an http site, a warning similar to the following warning is displayed:

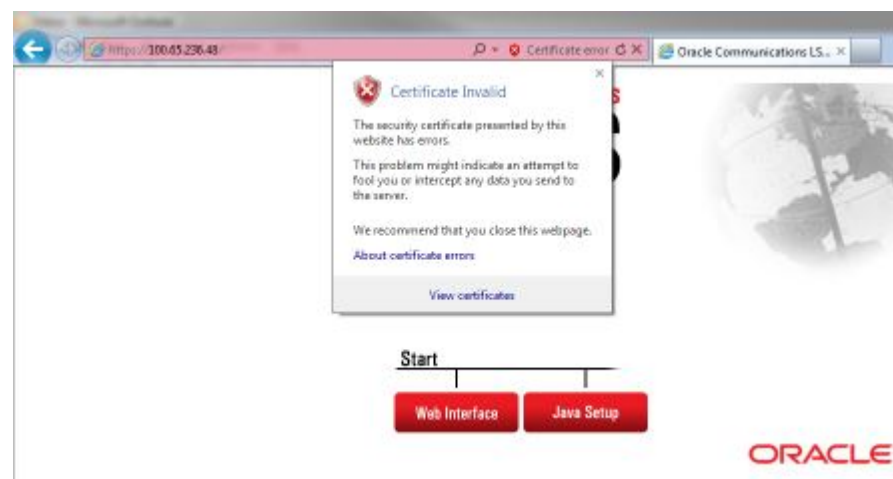
**Figure 3-12 Security Warning for HTTP Location**



Click **Continue** to add the server to the Exception Site List.

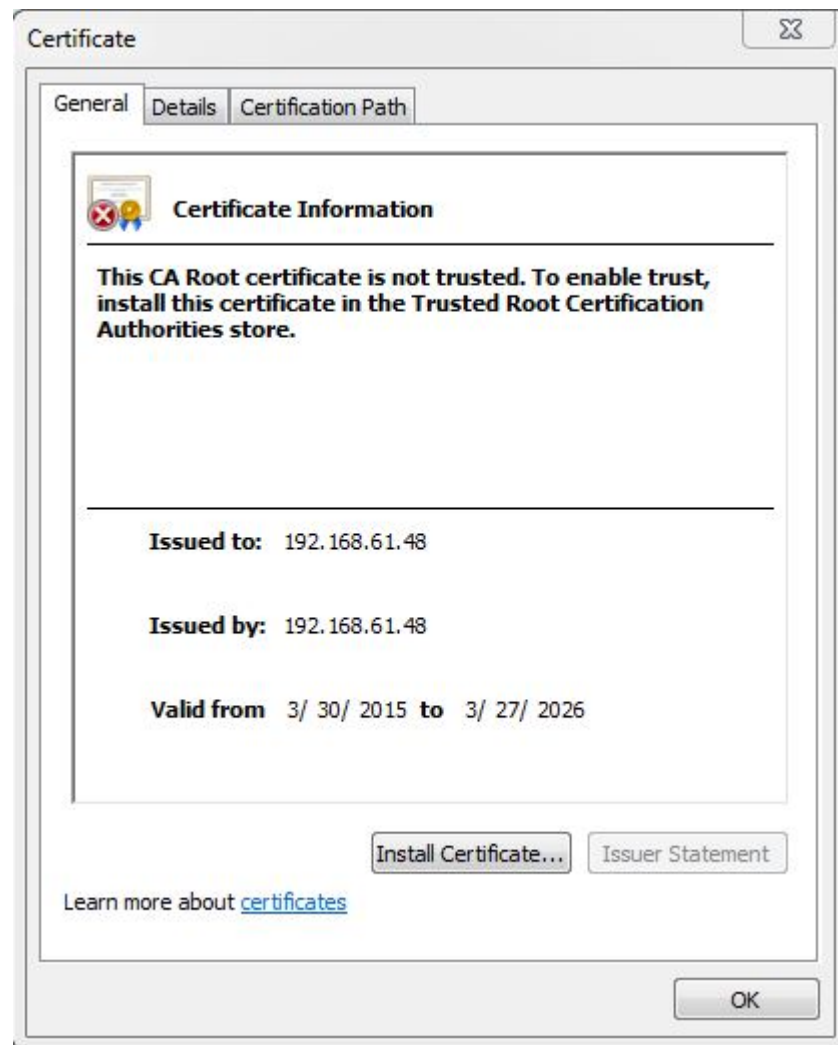
9. Click **OK** to exit the Java Control Panel and return to the GUI.
10. If using HTTPS and Internet Explorer, install the security certificate as follows. Otherwise, go to step 11.
  - a. Back at the Oracle Communications LSMS Start Page, click on `Certificate error` at the right of the address bar, and then click on `View certificates` in the popup window titled `Certificate Invalid`.

**Figure 3-13 Certificate Error**



The Certificate screen is displayed:

**Figure 3-14 Certificate Screen**



- b. Click on **Install Certificate**.

The Certificate Import Wizard opens:

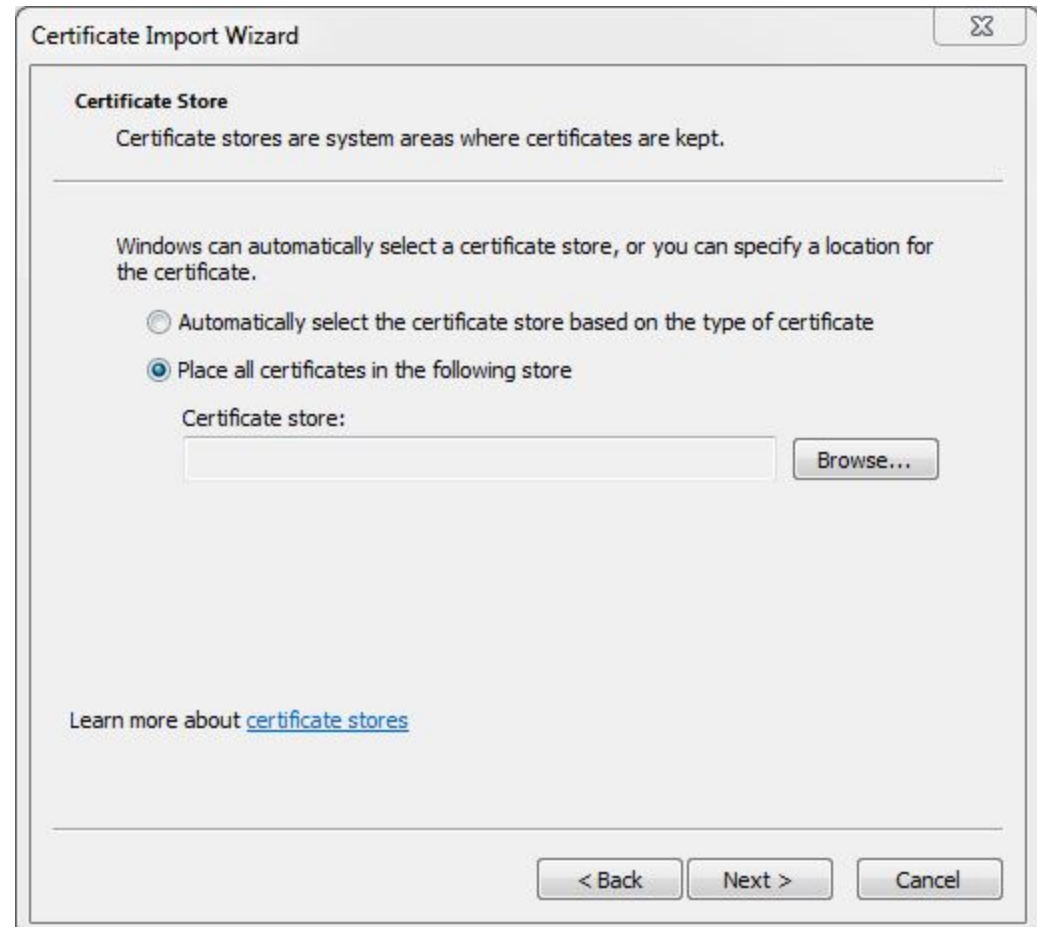


Figure 3-15 Certificate Import Wizard



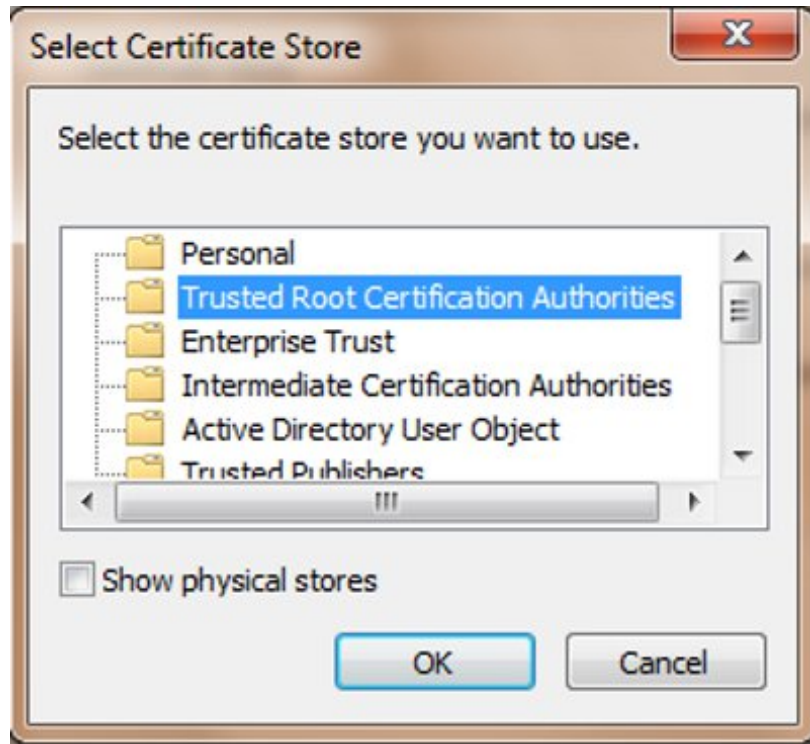
- c. Click on **Next >**, and then select the radio button to **Place all certificates in the following store:**

Figure 3-16 Certificate Import Wizard (continued)



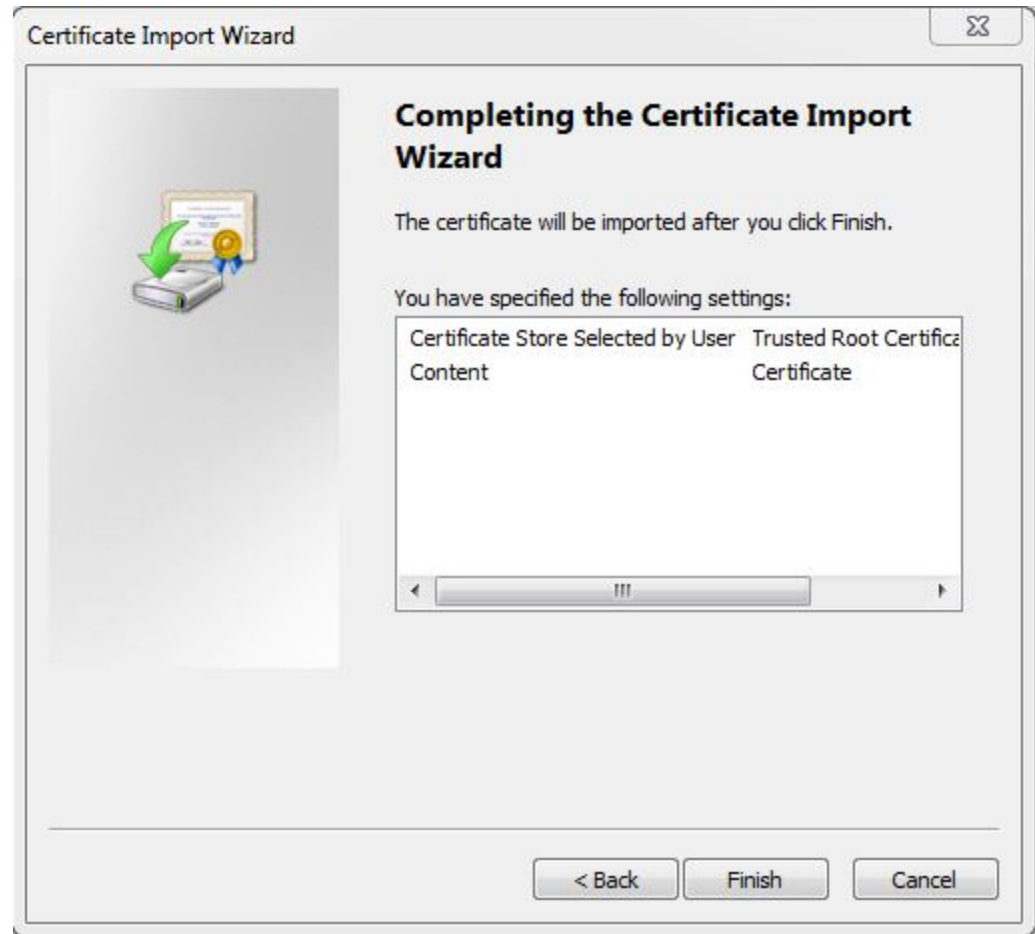
- d. Click on **Browse** to go to the Select Certificate Store window, and select **Trusted Root Certification Authorities**:

Figure 3-17 Select Certificate Store



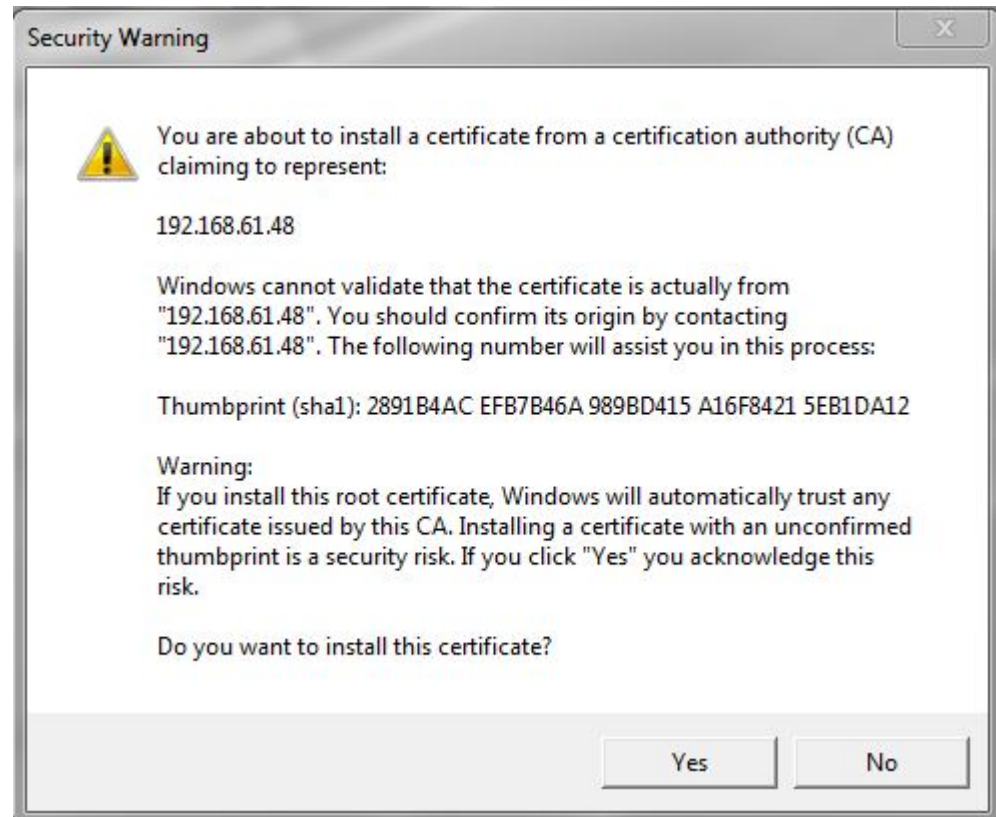
- e. Click **OK** and **Next**, and verify the settings:

Figure 3-18 Completing the Certificate Import Wizard



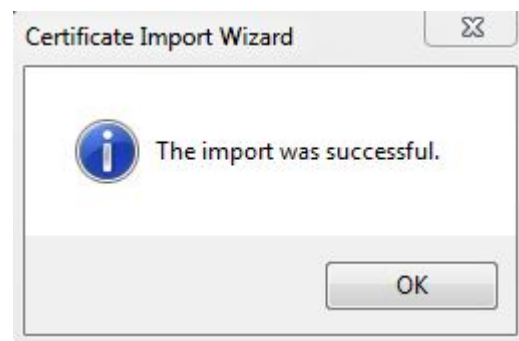
- f. Click **Finish**, and then verify that you want to install the certificate:

**Figure 3-19 Certificate Installation Security Warning**



- g. Click **Yes** to import the certificate:

**Figure 3-20 Certificate Import Successful**



- h. Click **OK**, and then **OK** again to exit the Certificate window.
  - i. Restart Internet Explorer.
11. Back at the Oracle Communications LSMS Start Page, click on the **Web Interface** button.

 **Note:**

If using HTTPS, click **Yes** and then **Continue** for the following security warnings:

**Figure 3-21 Insecure Content Warning**

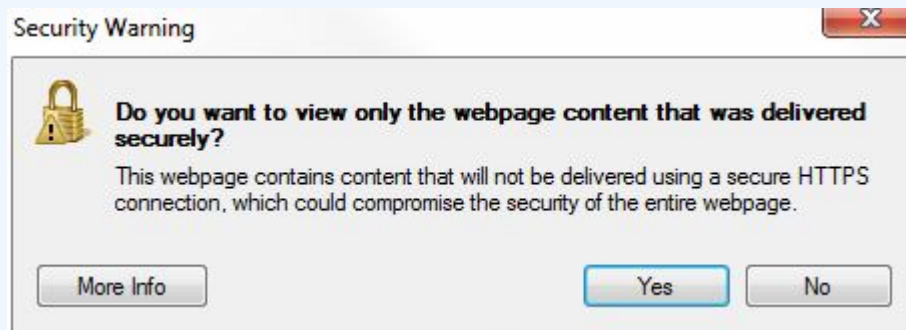
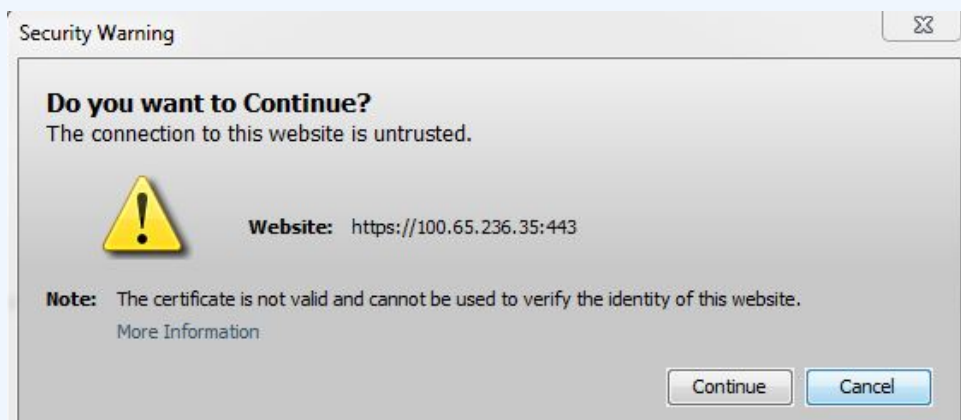


**Figure 3-22 Untrusted Website Warning**



12. Check the box to accept the risk to run the application, and click **Run**:

Figure 3-23 Application Security Warning



The LSMS Web GUI Start Page displays:

Figure 3-24 LSMS Web GUI Start Page with Login Button

## LSMS Web GUI Start Page



*Generated by Forte for Java*

13. Click the **Login** button.

The **LSMS** Login screen appears. From this point on, the web-based **GUI** works exactly like the server-side **GUI**. Next, perform the procedure described in [“Logging Into the LSMS Console Window”](#).



Figure 3-25 LSMS Welcome/Login Window



 **Note:**

If you log out of this web-based **LSMS GUI** session, you must start a new browser to log back in. If you only want to change user, select User/Session>Change User from the main **LSMS** menu.

### 3.2.4 Logging Into the LSMS Console Window

After one or more **SPIDs** have been defined, use the following procedure to log into the **LSMS** console.

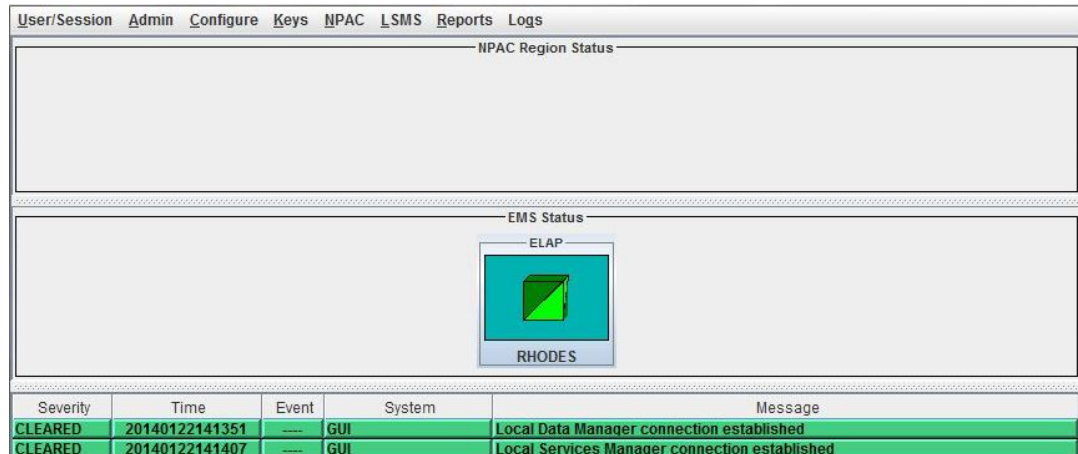
1. After you have completed the procedure described in [Starting a Web-Based LSMS GUI Session](#), the LSMS Welcome/Login Window displays.

Figure 3-26 LSMS Welcome/Login Window



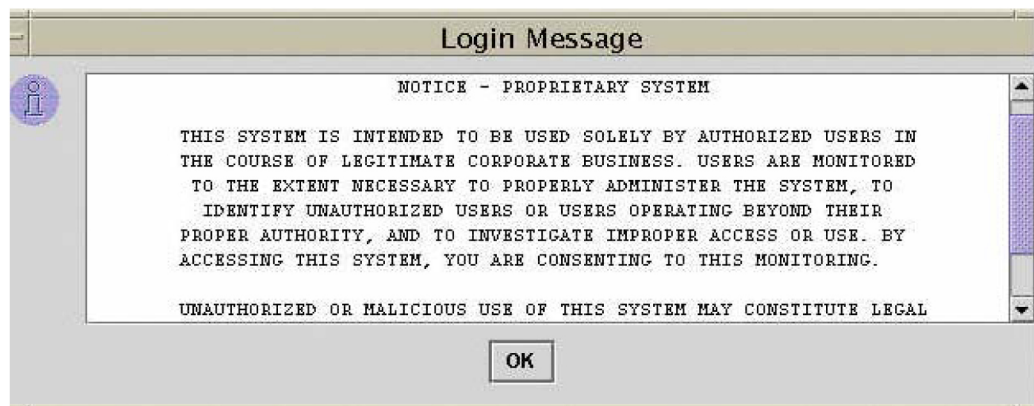
2. Enter the Service Provider ID (**SPID**), username, and password, which must be as follows:
  - The username and password must have been defined as described in [Managing User Accounts](#) (the group definition determines to which **GUI** menu items the username will have access).
  - The **SPID** must be one that has been defined on this **LSMS**, as described in “Service Provider Contact Information” in *Configuration Guide*. In addition, if the **SPID** Security feature has been enabled, you must enter a username that has been authorized to access the **SPID** you enter. For information about authorizing usernames to **SPIDs**, refer to *Configuration Guide*.
3. Click **Login**.
  - If the Customizable Login Message feature is not enabled (or it is enabled, but no message text has been created), the **LSMS Console** window displays:

Figure 3-27 LSMS Console Window



- If the Customizable Login Message feature is enabled and there is user-defined login message text configured, the Login Message dialog displays the message as shown in [Figure 3-28](#) before the **LSMS Console** window is displayed. System administrators are responsible for creating the customizable login message text (for information about how to create this message text, refer to *Configuration Guide*). Oracle Customer Service is responsible for enabling the feature.

Figure 3-28 Example of Login Message Dialog

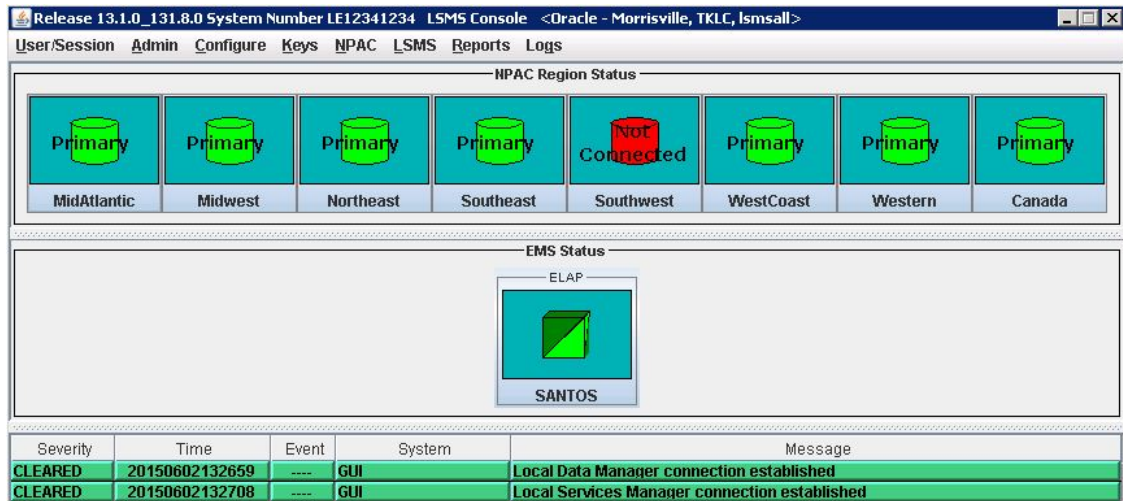


The Login Message dialog displays a 10 line by 80 character viewing area, with a scrollable text area up to a maximum of 5000 characters. Users must acknowledge this message by clicking the **OK** button.

### 3.2.5 Modifying Title Bar in LSMS Console Window

After you successfully log in to **LSMS**, the console window displays. If the `/usr/TKLC/lms/config/LSMSname` file exists and contains a (0–30 character) unique **LSMS** name, the name (in this example, "Oracle - Morrisville") is displayed in the title bar along with the **SPID** and user name. If the file does not exist or is empty (null), no name will be displayed and the title bar will look as before—displaying only the **SPID** and user name.

Figure 3-29 LSMS Console Window with Modified Title Bar



## 3.3 Powering On the LSMS

For information about powering on the **LSMS** servers (**LSMSPRI** and **LSMSSEC**), refer to *Application B Card Hardware and Installation Guide*.



### Note:

Powering on the **LSMS** servers (which can be done in any order) does not start the **LSMS** application and MySQL database services. To start those functions after restoring power to the servers, perform the following steps:

1. Log in to **LSMSPRI** as `lsmsmgr`.  
(For information about logging in, see [“Logging In to LSMS Server Command Line”](#).)
2. Select **Maintenance**, and then **Start Node** to initiate the following activities:
  - Uninhibit **LSMSPRI**
  - Transition **LSMSPRI** to the **HAACTIVE** state



### Note:

The database on **LSMSPRI** becomes the master.

3. Log in to **LSMSSEC** as `lsmsmgr`.  
(For information about logging in, see [“Logging In to LSMS Server Command Line”](#).)
4. Select **Maintenance**, and then **Start Node** to initiate the following activities:
  - Copy the database on **LSMSPRI** to **LSMSSEC**
  - Begin database replication on **LSMSSEC**.

 **Note:**

The **LSMSSEC** database becomes a slave.

- **HA** uninhibits **LSMSSEC**, allowing **LSMSSEC** to transition to a **HASTANDBY** state. **LSMSPRI** is now active and running the **LSMS** application; **LSMSSEC** is in a standby state.

## 3.4 Powering Off the LSMS

Before you turn off the system power, all applications on each server must be stopped and the operating system on each server must be stopped. Use the following procedure to power off the **LSMS**; contact My Oracle Support if additional assistance is needed.

 **warning:**

Do not disconnect or connect any cables to the system while the power is on. This action can damage the internal circuits.

1. On the **inactive server**:
  - a. Log in to the inactive server as `root`.  
(For information about logging in, see [“Logging In to LSMS Server Command Line”](#).)
  - b. Enter:  

```
init 0
```

  
The inactive server shuts down and powers off.
  - c. Check to ensure the Power Indicator on the T1100 is off.

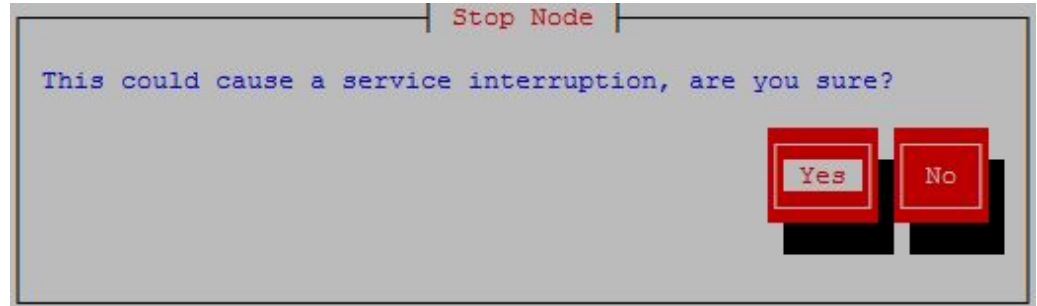
**Figure 3-30 T1100 Showing Power LEDs**



2. On the **active server**:
  - a. Log in to the active server as `lsmsmgr`.  
(For information about logging in, see [“Logging In to LSMS Server Command Line”](#).)

- b. Select **Maintenance**, and then **Stop Node** (see [Figure 3-31](#) and [Figure 3-32](#) for example screens that display after selecting Stop Node).

**Figure 3-31 Example Cautionary Message - Displayed after Selecting Stop Node**



- c. Select **Yes** to continue the Stop Node process.

 **Note:**

Selecting **Yes** on this screen stops the **LSMS** application and it also stops the MySQL database services from running.

**Figure 3-32 Example Message - Stop Node Completed Successfully**



- d. Press any key to continue.
- e. Exit the lsmsmgr interface by highlighting **Exit** and pressing **Enter** until you have completely exited.
- f. Log in as `root` on the active server.  
(For information about logging in, see [Logging In to LSMS Server Command Line](#).)
- g. Enter:  

```
init 0
```

The active server shuts down and powers off.

- h. Check to ensure the Power **LEDs** on the T1100 are off (see [Figure 3-30](#)).

## 3.5 Managing the System Clock

The **NPAC** and **LSMS** system times must be within five minutes of each other, with the **NPAC** serving as the master. If the **NPAC** and **LSMS** system times are not within five minutes of each other, one of the following **GUI** notifications may be posted:

```
[Critical]: <Timestamp> 2003: NPAC [<PRIMARY|SECONDARY>] Connection Aborted
by PEER : Access Control Failure
```

```
[Critical]: <Timestamp> 2012: NPAC [<PRIMARY|SECONDARY>] Connection Attempt
Failed : Access Control Failure
```

If one of these notifications appears, verify and, if necessary, reset the **LSMS** time using the methods described in either of the following sections:

- [Automatically Controlling the LSMS Time Using NTP](#). Using the Network Time Protocol (**NTP**) requires access to accurate **NTP** servers, but results in the **LSMS** rarely, if ever, being out of synchronization with the **NPAC**. This section describes how to troubleshoot the rare problems with **NTP**.
- [Manually Controlling the LSMS Time Without an External NTP Source](#). Using only manual methods to control the **LSMS** time can result in cases of the **LSMS** being out of synchronization with the **NPAC**.

### Note:

ntpd is replaced by chronyd daemon as the default NTP client on OL8. Chronyd is used to sync time with NTP server on the latest OL8. All the ntpd commands used to sync time with NTP server will be replaced by chronyd and chronyc.

### 3.5.1 Automatically Controlling the LSMS Time Using NTP

The **LSMS** allows you to configure the **LSMS** as an industry-standard Network Time Protocol (**NTP**) client that communicates with one or more **NTP** servers elsewhere in your network. **NTP** reads a time server's clock and transmits the reading to one or more clients with each client adjusting its clock as required.

#### 3.5.1.1 Configuring the LSMS as an NTP Client

The **NTP** client protocol is incorporated with the operating system that is included with **LSMS**. If you choose to implement the **LSMS** as an **NTP** client, you must set up one or more **NTP** servers in your own network (or synchronize with some portion of the existing **NTP** subnet that runs on the Internet) and configure the **LSMS** to contact those **NTP** servers. For information about selecting **NTP** servers and configuring the **LSMS** as an **NTP** client and about displaying current settings for **NTP**, refer to the *Configuration Guide*.



If you prefer not to configure the **LSMS** as an **NTP** client, you can manually reset the **LSMS** time when it drifts out of synchronization with the **NPAC** time, as described in [Manually Controlling the LSMS Time Without an External NTP Source](#).

### 3.5.1.2 Verifying NTP Service

Use the following procedure to verify that the time server is working.

- Log in to `lsmspri` as `root` and enter the following command:

```
chronyc sources
MS Name/IP address Stratum Poll Reach LastRx Last sample
=====
====
^* chronyserver1 3 7 377 11 -6038ns[+13us] +/-
50ms
[root@lsmspri ~]# chronyc tracking
Reference ID : 0A4B7CF7 (chronyserver1)
Stratum : 4
Ref time (UTC) : Fri Dec 22 07:45:29 2023
System time : 0.000002198 seconds slow of NTP time
Last offset : -0.000004779 seconds
RMS offset : 0.000010075 seconds
Frequency : 11.696 ppm slow
Residual freq : -0.004 ppm
Skew : 0.105 ppm
Root delay : 0.072550341 seconds
Root dispersion : 0.013579763 seconds
Update interval : 65.3 seconds
Leap status : Normal
```

- If the time server is working, output similar to the following displays:

```
server 198.89.40.60, stratum 2, offset 106.083658, delay 0.02632
22 May 14:23:41 ntpdate[7822]: step time server 198.89.40.60 offset
106.083658 sec
```

- If the time server is not working or is unavailable, output similar to the following displays:

```
server 198.89.40.60, stratum 0, offset 0.000000, delay 0.000000
22 May 14:33:41 ntpdate[7822]: no server suitable for synchronization
found
```

### 3.5.1.3 Troubleshooting NTP Problems

If you configure the **LSMS** to communicate with several **NTP** servers, you should rarely encounter any problems with **NTP**. This section describes how to troubleshoot the following rare, but possible, error conditions:

- [Reference Time Off By More Than Twenty Minutes](#)
- [Violation of Maximum Oscillator Frequency in Network](#)



### 3.5.1.3.1 Reference Time Off By More Than Twenty Minutes

The **LSMS's NTP client daemon** expects that the **LSMS** system time has been set close to the real time. If the reference time received from the **NTP** server is significantly different from the **LSMS** system time, the **daemon** waits up to twenty minutes until it sets the time. However, if the reference time is off more than about twenty minutes (which is rare), the **daemon** terminates and does not set the system time.

If you think that the **daemon** may have terminated, perform the following procedure:

1. Determine whether the `chronyd` daemon process is running by logging in as `root` and entering the following command:  
  
# `chronyd -v`  
If the **daemon** is not running, check the `/var/log/messages` file.
2. To set the system clock, either perform the process described in [Manually Controlling the LSMS Time Without an External NTP Source](#) or enter the following command:

```
chronyd -q <IP_address_of_NTP_server>
```

3. Start the `ntpd`**daemon** by entering the following commands:

```
systemctl start chronyd
```

```
systemctl enable chronyd
```

4. Verify that the `chronyd`**daemon** started by repeating step 1.

### 3.5.1.3.2 Violation of Maximum Oscillator Frequency in Network

The **NTP** protocol specifies that systems should have a maximum oscillator frequency tolerance of plus or minus 100 parts-per-million (ppm). This tolerance allows relatively inexpensive workstation platforms to use the **NTP** protocol. For platforms that meet this tolerance, **NTP** automatically compensates for the frequency errors of the individual oscillator, such that no additional adjustments are required to either the configuration file or to various kernel variables.

However, some platforms routinely violate this tolerance, and their violation can affect other time servers or time clients in a network. Although the **LSMS** meets the tolerance requirement, if your network contains other systems that do not meet the tolerance requirement, you may need to adjust the values of certain kernel variables.

## 3.5.2 Manually Controlling the LSMS Time Without an External NTP Source

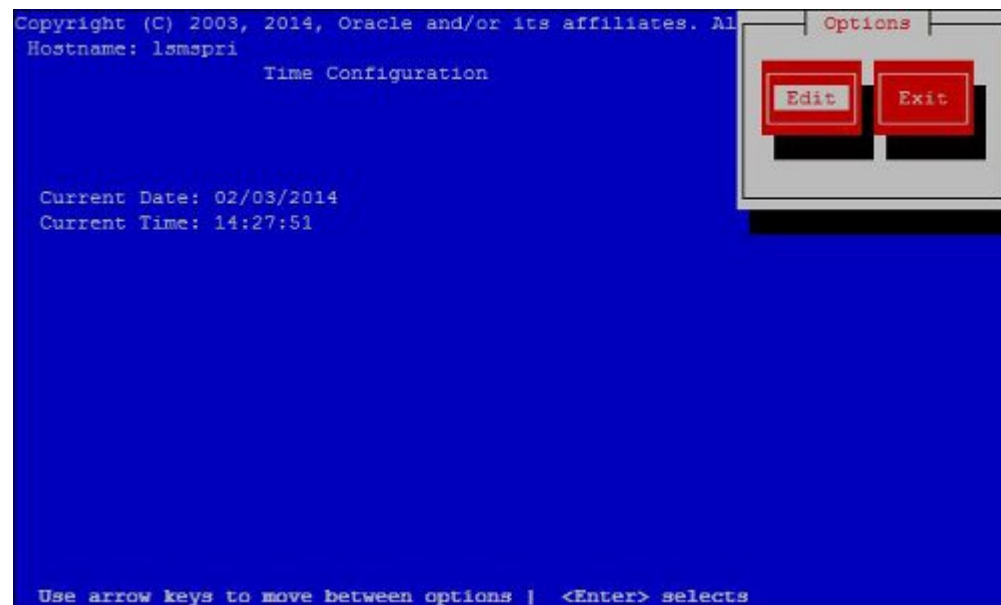
If you choose not to configure the **LSMS** to use an **NTP** server, you can use the following procedure to resynchronize the **LSMS** system time with the **NPAC** time when one of the notifications described in [Managing the System Clock](#) is posted:

Generally, the following procedure is used only when the **LSMS** is first installed. However, if you are not able to use another method of synchronizing time with an **NPAC** (as described in [Automatically Controlling the LSMS Time Using NTP](#)), you can contact the **NPAC** administrator, inquire the time used at the **NPAC**, and use the following procedure to manually set the **LSMS** system time and date.

Internal system times are stored in **GMT**; however, the time and date are typed in the local time zone and converted automatically. If you need to check the local time zone, you can use the `env` command with the `TZ` variable.

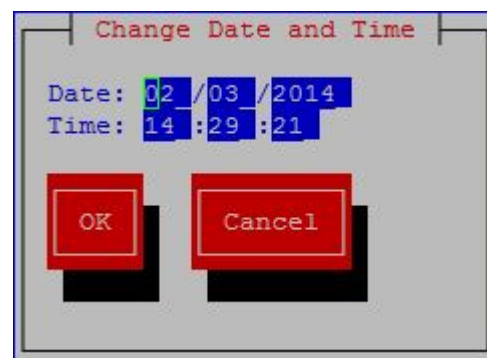
1. Log in to active server as `lsmsmgr`.  
(For information about logging in, see [Logging In to LSMS Server Command Line](#).)
2. From the main `lsmsmgr` menu, select **Server Configuration**, and then **Set Clock**.  
A window similar to [Figure 3-33](#) displays.

**Figure 3-33 Set Clock Window**



3. If you need to change the current date or time, press Enter while the Edit button is highlighted.  
A window similar to [Figure 3-34](#) displays.

**Figure 3-34 Change Date and Time Window**



4. Use the down and up arrow keys to move to the field that you want to change.  
Within a field, use the right and left arrow keys to move within a field, delete digits by pressing the Delete key and enter digits by typing them in. When you the values are what you want, press the down arrow key until the **OK** button is highlighted, and then press

Enter. The window shown in [Figure 3-11](#) is displayed again, and it should now display the date and time you set in this step.

5. Log in to the standby server as `lsmmgr`, and repeat steps 1 through 4.
6. If you have changed the time by more than five minutes, it is recommended that you reboot each server.

## 3.6 Managing User Accounts

This section provides information about the following topics:

- Overview information about user names and passwords
- Overview information about the **SPID** Security feature
- Non-configurable permission groups
- Configurable permission groups
- Managing user accounts on the primary and secondary servers
- Managing user accounts on the administration console
- Changing account passwords using Linux commands
- Activating the **SPID** Security feature

### Overview of User Names and Passwords

The system administrator assigns user names and passwords. Each user name is assigned to one of the following permission groups:



#### Note:

It is possible for an individual user name to have the same value as a group name. For example, usually a user named `lmsadm` is assigned to the `lmsadm` permission group. Some **LSMS** commands require the user to be logged in with the `lmsadm` user name.

- `lmsall`
- `lmsadm`
- `lmsuser`
- `lmsuext`
- `lmsview`

The permission groups govern which commands and which **GUI** functions the user is allowed to use.

### Overview of SPID Security Feature

In addition, the **LSMS** offers the optional **SPID** Security feature that allows the **LSMS** administrator to assign only certain usernames to be allowed to log on with a specified Service Provider Identifier (**SPID**). Alternatively, the **LSMS** administrator can assign a username to be given access to all **SPIDs**; such a user is called a “golden user.”

**Association** of a username with a **SPID** allows the **LSMS** system administrator to restrict access to the following types of locally provisioned data (for more information about associating usernames with **SPIDs**, see [Activating the SPID Security Feature](#)):

- Default global title translation (**GTT**)
- Override **GTT**
- **GTT** Groups
- Telephone number (**TN**) filters
- Assignment of **GTT** groups and **TN** filters to an Element Management System (EMS). For more information about **GTT** groups, refer to the *Database Administrator's Guide*.

Accessibility to these types of data are protected by **SPID** security for any access method (for example, through the **GUI**, through input data by file, audit, and reconcile).

The **SPID** Security feature is especially useful for **LSMS** customers that act as service bureaus, offering **LSMS** services to other service providers. The service bureau may administer locally provisioned data for a client and may choose to allow the client to administer or view its own data without allowing that client to view or change data belonging to other clients.



#### Note:

Without this optional feature, any user can log in using any **SPID** that is defined on the **LSMS**. The user is able to view any data for any **SPID**, and depending on which user privileges were assigned to that username, may be able to change data associated with any **SPID**.

## 3.6.1 Non-Configurable Permission Groups

[Table 3-2](#) shows a summary of privileges allowed to each user type.

**Table 3-2 User Types**

| User type                  | Privileges                                                                                                                                                                                                                                                              | User secondary group name | SPID value for logging in                                                     |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------|
| System Administration User | Allows the user to inherit all the privileges of all other user types                                                                                                                                                                                                   | lsmsall                   | <b>NPAC</b> -assigned <b>SPID</b> (refer to the <i>Configuration Guide</i> ). |
| System Configuration User  | Allows the user to: <ul style="list-style-type: none"> <li>• Create, modify and maintain the <b>LNP</b> systems, key lists, associations, and the MySQL databases</li> <li>• Stop automatic audits.</li> <li>• Inherit all the privileges of the Viewer User</li> </ul> | lsmsadm                   | <b>NPAC</b> -assigned <b>SPID</b> (refer to the <i>Configuration Guide</i> ). |

Table 3-2 (Cont.) User Types

| User type                    | Privileges                                                                                                                                                                                                                                                                           | User secondary group name | SPID value for logging in                                                                                                         |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Database Administration User | Allows the user to: <ul style="list-style-type: none"> <li>Modify and maintain the <b>NPAC</b> and supported service provider data</li> <li>Have unlimited access to all <b>LNP</b> related-logs, data, and tables</li> <li>Inherit all the privileges of the Viewer User</li> </ul> | lsmsuser                  | Any <b>SPID</b> . If a shadow <b>LSMS</b> exists, use the same <b>SPID</b> for similar functions on main and shadow <b>LSMS</b> . |
| External User                | Allows the user the same access as <code>lsmsuser</code> , but the user is not permitted access to the <b>NPAC</b> menu on <b>LSMS GUI</b>                                                                                                                                           | lsmsuext                  | Any <b>SPID</b> . If a shadow <b>LSMS</b> exists, use the same <b>SPID</b> for similar functions on main and shadow <b>LSMS</b> . |
| Viewer User                  | Allows the user: <ul style="list-style-type: none"> <li>Read access to the <b>LNP</b> data and tables</li> <li>Limited read access to resource displays and logs</li> <li>Unlimited access to viewing and acknowledging all alarms</li> </ul>                                        | lsmsview                  | Any <b>SPID</b> .                                                                                                                 |

### User Permissions for LSMS Commands

[Table 3-3](#) shows the commands each user type has permission to execute. For more information about the commands, see [Commands](#).

Table 3-3 Access to LSMS Commands

| Command                                                                                                                                                                                                                                                                                 | root | lsmsadm | lsmsuser | lsmsview | lsmsall | lsmsuext |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------|----------|----------|---------|----------|
| Command permissions: X = Users in this group have permission to use this command.<br>lsmsadm = The user must be logged in with the name lsmsadm to have permission to use this command.<br>root = The user must be logged in with the name root to have permission to use this command. |      |         |          |          |         |          |
| autoxfercfg                                                                                                                                                                                                                                                                             |      | X       |          |          |         |          |
| chglct                                                                                                                                                                                                                                                                                  |      | X       |          |          |         |          |
| chkfilter                                                                                                                                                                                                                                                                               |      | X       |          |          |         |          |
| eagle                                                                                                                                                                                                                                                                                   |      | lsmsadm |          |          |         |          |
| import                                                                                                                                                                                                                                                                                  |      | X       | X        | X        | X       | X        |
| keyutil                                                                                                                                                                                                                                                                                 |      | lsmsadm |          |          |         |          |

**Table 3-3 (Cont.) Access to LSMS Commands**

| Command         | root | lsmsadm | lsmsuser | lsmsview | lsmsall | lsmsuext |
|-----------------|------|---------|----------|----------|---------|----------|
| lsms            |      | lsmsadm |          |          |         |          |
| lsmsdb          | root | X       | X        | X        | X       | X        |
| lsmsSNMP        |      | X       |          |          |         |          |
| lsmsurv         | root |         |          |          |         |          |
| massupdate      |      | lsmsadm |          |          |         |          |
| measdump        |      |         | X        | X        | X       | X        |
| npac_db_setup   |      | lsmsadm |          |          |         |          |
| npacimport      |      | lsmsadm |          |          |         |          |
| report          |      | X       | X        | X        | X       | X        |
| resync_db_setup |      | lsmsadm |          |          |         |          |
| SAagent         |      | X       |          |          |         |          |
| spidsec         |      | lsmsadm |          |          |         |          |
| sup             |      | lsmsadm |          |          |         |          |
| sup_db_setup    |      | lsmsadm |          |          |         |          |
| survNotify      | root | X       | X        | X        | X       | X        |
| syscheck        | root |         |          |          |         |          |

**User Permissions for GUI Functions**

For information about the **GUI** functions each permission group can access, refer to the tables in the *Configuration Guide* (Admin **GUI** Access, Configure User Access, and Keys **GUI** Access) and the *Database Administrator's Guide* (User/Session **GUI** Access, **NPAC GUI** Access, **LSMS GUI** Access, Reports **GUI** Access, Logs **GUI** Access, and Popup Menus **GUI** Access).

## 3.6.2 Configurable Permission Groups (LSMS Command Class Mgmt)

When the optional **LSMS Command Class** Management feature is enabled, **LSMS** supports configurable **GUI** permission groups *in addition to* the five non-configurable **GUI** permission groups (`lsmsadm`, `lsmsuser`, `lsmsview`, `lsmsall`, and `lsmsuext`).

The **LSMS** supports the creation of 128 additional, configurable **GUI** permission groups that can be used to ensure a specific and secure environment. After creating the new, configurable **GUI** permission groups, the system administrator can assign users to the appropriate group.

The configurable **GUI** permission groups control access to **GUI** commands, the **CLAA** (Command Line Administration Application) equivalent, or any command-line equivalent of **GUI** functions.

A method to control access to a fixed set of commands is provided. Existing commands, executables, and scripts are classified as follows:

- Command-line equivalents of **GUI** commands (Reports and functions of **CLAA**)  
These commands are controlled by the assignment of the corresponding **GUI** function.
- Optional command-line capability for Report Generator (**LQL**)  
This command may be assigned individually, similar to **GUI** commands, to one or more permission groups.

- Root privilege-only commands  
These commands are root-only and are not assignable to any permission group.
- Other commands owned by `lsmsadm`  
These commands include those used by the **LSMS** application, those used to control processes, and those for setup and configuration. Commands in this category are grouped as a single set of administration commands. Users may or may not be granted access to this command-line group, in addition to being assigned to the appropriate **GUI** group.  
  
Some commands in this group, although owned by `lsmsadm`, are accessible to non-owners for limited operation, such as status. The incorporation of this feature will not have any impact on the current privileges of commands for non-owners.

Example:

To set up a custom environment, system administrators should define the **GUI** permission groups and populate those groups with the appropriate commands:

**Table 3-4 Define GUI Permission Groups and Assign Command Privileges**

| GUI Permission Group    | Command Privileges               |
|-------------------------|----------------------------------|
| Custom <b>GUICONFIG</b> | All Configuration Commands       |
| Custom <b>GUIEMS</b>    | All <b>EMS</b> -related Commands |
| Custom <b>GUISUPER</b>  | All <b>GUI</b> Commands          |

Optionally, assign users (for example, Mike, Sally, and Bill) to a specific command-line permission group (in this example, `lsmsadm`) or **GUI** permission group.

**Table 3-5 User Assignment Examples**

| User  | Linux Permission Group | GUI Permission Group    |
|-------|------------------------|-------------------------|
| Mike  | <code>lsmsadm</code>   | Custom <b>GUICONFIG</b> |
| Joe   | <code>lsmsall</code>   | Custom <b>GUIEMS</b>    |
| Sally | <code>lsmsadm</code>   | <code>lsmsadm</code>    |
| Bill  | <code>lsmsadm</code>   | Custom <b>GUISUPER</b>  |



**Note:**

Secure activation is required because this is an optional feature.

After activating this feature, you can create permission groups and assign users to these new groups.



**Note:**

Changes in privileges do not automatically occur upon feature activation.

### Permission Group Naming

- The **LSMS** supports the ability to uniquely name each configurable **GUI** permission group.

- A group name can consist of a minimum of one character to a maximum of 40 characters (only alphanumeric characters are permitted).

#### Permission Group Contents

- Each configurable **GUI** permission group supports any or all of the **LSMS GUI** commands.

 **Note:**

The **GUI** command represents the function, via either the **GUI**, **CLAA**, or command-line equivalent of **GUI** commands.

- Any **GUI** command may be associated with multiple **GUI** permission groups.
- The optional **LQL** command for the Report Generator feature can be placed in **GUI** permission groups.
- The **LSMS** supports a group containing the current **LSMS** `lsmsadm` commands with the exception of Report, Audit, and **LQL**.

#### Permission Group Commands

The **LSMS** enables you to perform the following tasks:

- Create and modify **GUI** permission groups.
- Assign a user to a single **GUI** permission group.
- Assign a user access to the command group in addition to a **GUI** permission group.
- Retrieve the names of all permission groups, all the commands permitted within a permission group, and the names of all permission groups that contain a particular command.

### 3.6.2.1 Permission Group Processing

#### GUI Functions:

The **LSMS** allows a **GUI** user access to **GUI** commands, **CLAA** commands, or command-line equivalents of **GUI** commands only if that user is an authorized user.

#### Command-Line-Level:

The **LSMS** allows a user access to command-line-level scripts and executables only if that user is an authorized user.

 **Note:**

For more information about command class management and configurable permission groups, refer to the *Configuration Guide*.

### 3.6.3 Managing User Accounts on the Primary and Secondary Servers

To manage user accounts, **LSMS** utilizes the `lsmsdb` command. This command allows you to add and delete user accounts, change passwords, and list users. The `lsmsdb` command makes the appropriate changes in the system `/etc/passwd` file.



The following topics explain how to use the `lsmsdb` command to administer **LSMS** user accounts:

- [Adding a User](#)
- [Deleting a User](#)
- [Setting the System Level Password Timeout Using the Command Line](#)
- [Setting the User Level Password Timeout Using the Command Line](#)
- [Displaying All LSMS User Accounts](#)

 **Note:**

The `lsmsdb` command modifies files on the local system (the system on which `lsmsdb` is executed). It does not modify or update global network databases. Therefore, if you add or modify users on one server, make the same change on the other server. Sometimes, for specific administration purposes, you might add or modify users on the servers without adding or modifying them on the administration console.

The following topics explain how to use the **LSMS GUI** to administer **LSMS** user accounts:

- [Setting the System Level Password Timeout Using the GUI](#)
- [Setting the User Level Password Timeout Interval Using the GUI](#)
- [Viewing the Active User List](#)
- [Terminating an Active User Session](#)

### 3.6.3.1 Adding a User

Use the following procedure to add a user account:

1. Log in as `root` and type your password.

For more information, see [Logging In to LSMS Server Command Line](#).

2. Execute `lsmsdb` with the `adduser` command option:

```
$ cd $LSMS_TOOLS_DIR
$ lsmsdb -c adduser -u <username>
```

3. When the following prompt appears, enter the user password.

Enter password:

4. When the following prompt appears, enter the user password again.

Re-enter password:

 **Note:**

If you did not enter the same password in Steps 3 and 4, the following warning is displayed:

```
WARNING: Passwords must match.
#
```

In this case, go back to Step 1; otherwise, proceed with Step 5.

5. When the following prompt is displayed, select the **LSMS** group name (`lsmsadm`, `lsmsuser`, `lsmsview`, `lsmsuext`, or `lsmsall`) for the user by entering the corresponding number in the `CHOICE` field, then press `<return>`.

```
Select Secondary Permission Group From List:
1) lsmsadm
2) lsmsuser
3) lsmsview
4) lsmsuext
5) lsmsall
CHOICE:
```

6. When the following prompt appears, enter **Y** or **N** in the `CHOICE` field to indicate whether you want to enter an expiration date for this login.

```
Set expiration date? Y/N
CHOICE:
```

 **Note:**

If you enter an expiration date, the user will not be allowed to login to this account after that date.

If you enter **Y** in the `CHOICE` field, the following prompt appears:

```
Enter expiration date (mm/dd/yyyy):
```

7. When the following prompt appears, enter **Y** or **N** in the `CHOICE` field to indicate whether you want to enter an **Inactivity Value** (in days) for this account.

```
Set inactivity value? Y/N
CHOICE:
```

 **Note:**

If you enter a value (in days), the account will be declared invalid and the user will not be allowed to use that account for the number of days specified.

If you enter **Y** in the `CHOICE` field, the following prompt appears:

Enter a number (of days):

8. If any other error or warning message displays, contact My Oracle Support.
9. Repeat on other server, if desired.

### 3.6.3.2 Deleting a User

Use the following procedure to remove a user account:

1. Log in as `root` and type your password.

For more information, see [Logging In to LSMS Server Command Line](#).

2. Execute `lsmsdb` with the `rmuser` command option:

```
$ cd $LSMS_TOOLS_DIR
$ lsmsdb -c rmuser -u <username>
```

Upon completion of the command, the prompt will be returned.

3. If an error or warning message displays, contact My Oracle Support.

### 3.6.3.3 Changing a User Password

Use the following procedure to change a user password:

 **Note:**

The `lsmsdb -c chguserpw -u <username>` command must be run only on the Active LSMS server to completely change the password.

1. Log in as `root`, or as the user for which the password is going to be changed, and type your password.

For more information, see [Logging In to LSMS Server Command Line](#).

2. Execute `lsmsdb` with the `chguserpw` command option:

```
$ cd $LSMS_TOOLS_DIR
$ lsmsdb -c chguserpw -u <username>
```

3. When the following prompt appears, enter the current user password.

Enter current password:

4. When the following prompt appears, enter the new user password.

```
Enter new password:
```

5. When the following prompt appears, enter the new user password again.

```
Re-enter new password:
```

 **Note:**

If you did not enter the same password in Steps 3 and 4, the following warning is displayed:

```
WARNING: Passwords must match. #
```

In this case, go back to Step 1; otherwise, proceed with Step 6.

6. If any other error or warning message displays, contact My Oracle Support.

### 3.6.3.4 Setting the System Level Password Timeout Using the Command Line

Use the following procedure to set the system level password timeout using the command line:

1. Log in as `lsmsadm` and type your password.

For more information, see [Logging In to LSMS Server Command Line](#).

2. Execute `lsmsdb` with the `sypwexp` command option:

```
$ cd $LSMS_TOOLS_DIR
$ lsmsdb -c sypwexp
```

3. When the following prompt appears, enter **Y**.

```
Configured value: -1
Set password expiration interval? Y/N
```

 **Note:**

A configured value of -1 indicates the password timeout has not been configured. A configured value of 0 indicates the password timeout has been configured and the password is valid for an indefinite period of time.

4. When the following prompt appears, enter the password timeout interval.

```
Set maximum number of days before password expires for users.
This will set the default password expiration interval for all users.
```

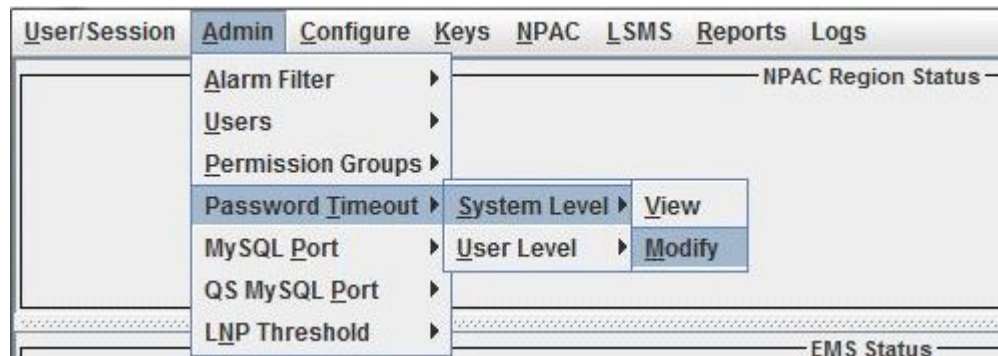
Valid values are 0 (never expire) or 1 to 180 days.  
Enter value:

### 3.6.3.5 Setting the System Level Password Timeout Using the GUI

Use the following procedure to set the system level password timeout using the **GUI**:

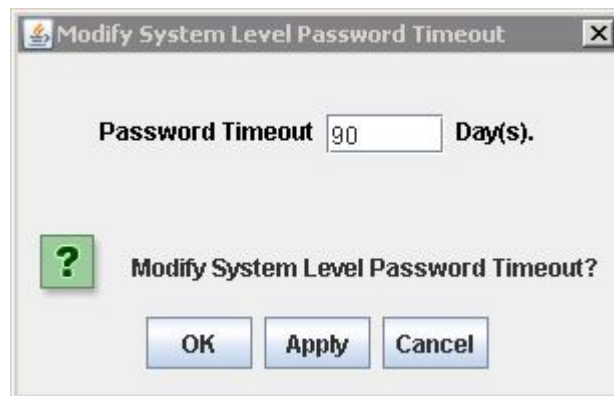
1. Log in to the **LSMS Console** as a user in the `lsmsadm` or `lsmsall` group.
2. From the main menu, select **Admin**, and then **Password Timeout**, and then **System Level**, and then **Modify**.

**Figure 3-35** Modifying the System Level Password Timeout



3. Click **Modify**, and the Modify System Level Password Timeout dialog displays.

**Figure 3-36** Modify System Level Password Timeout



4. Type in the number of days for the password timeout interval, then click **OK** .  
If you have successfully modified the password timeout, then the Update Successful dialog displays.

**Figure 3-37** Update Successful



5. Click **OK**.

### 3.6.3.6 Setting the User Level Password Timeout Using the Command Line

Use the following procedure to set the system level password timeout using the command line:

1. Log in as `lsmsadm` and type your password.  
For more information, see [Logging In to LSMS Server Command Line](#).
2. Execute `lsmsdb` with the `usrpwexp` command option:  

```
$ cd $LSMS_TOOLS_DIR
$ lsmsdb -c usrpwexp -u <username>
```
3. When the following prompt appears, enter **Y**.

```
Configured value: -1
Set password expiration interval? Y/N
```

#### Note:

A configured value of -1 indicates the password timeout has not been configured. A configured value of 0 indicates the password timeout has been configured and the password is valid for an indefinite period of time.

4. When the following prompt appears, enter the password timeout interval.

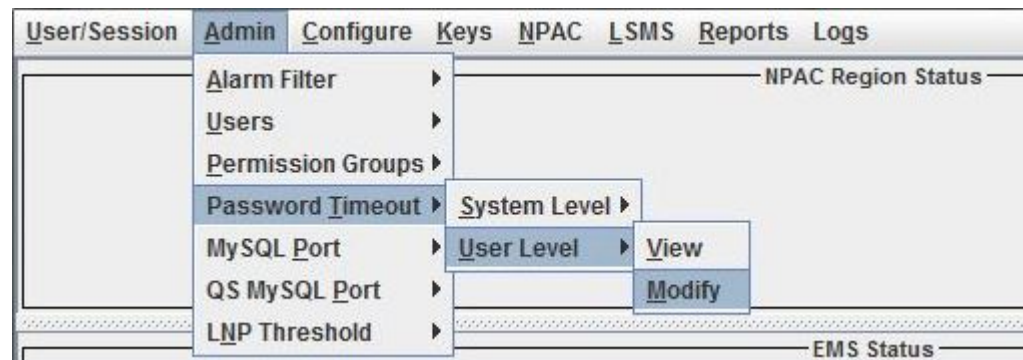
```
Set maximum number of days before password expires for the user.
Valid values are 0 (never expire) or 1 to 180 days.
Enter value:
```

### 3.6.3.7 Setting the User Level Password Timeout Interval Using the GUI

Use the following procedure to set the system level password timeout using the **GUI**:

1. Log in to the **LSMS Console** as a user in the `lsmsadm` or `lsmsall` group.
2. From the main menu, select **Admin**, and then **Password Timeout**, and then **User Level**, and then **Modify**.

**Figure 3-38** Modifying the User Level Password Timeout Interval



3. Click **Modify**, and the Modify User Level Password Timeout dialog displays.

**Figure 3-39 Modify User Level Password Timeout**



4. Select a user whose password timeout interval you want to modify.
5. Type in the number of days for the password timeout interval, then click **OK** .  
If you have successfully modified the password timeout, then the Update Successful dialog displays.

**Figure 3-40 Update Successful**



6. Click **OK** .

### 3.6.3.8 Displaying All LSMS User Accounts

Use the following procedure to display a list of all **LSMS GUI** Users:

1. Log in as `root` and type your password.  
For more information, see [Logging In to LSMS Server Command Line](#).
2. Execute `lsmsdb` with the `users` command option:

```
$ cd $LSMS_TOOLS_DIR
$ lsmsdb -c users
```

The configured **LSMS** users will be output one user per line.

Following are the default MySQL users:

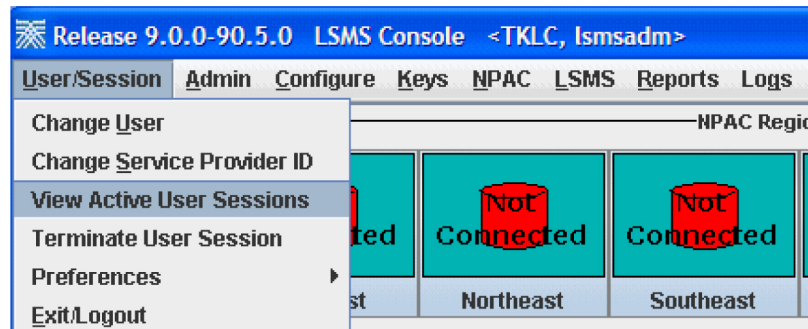
```
mysql.infoschema
mysql.session
mysql.sys
```

### 3.6.3.9 Viewing the Active User List

Use the following procedure to display a list of active **LSMS GUI** Users:

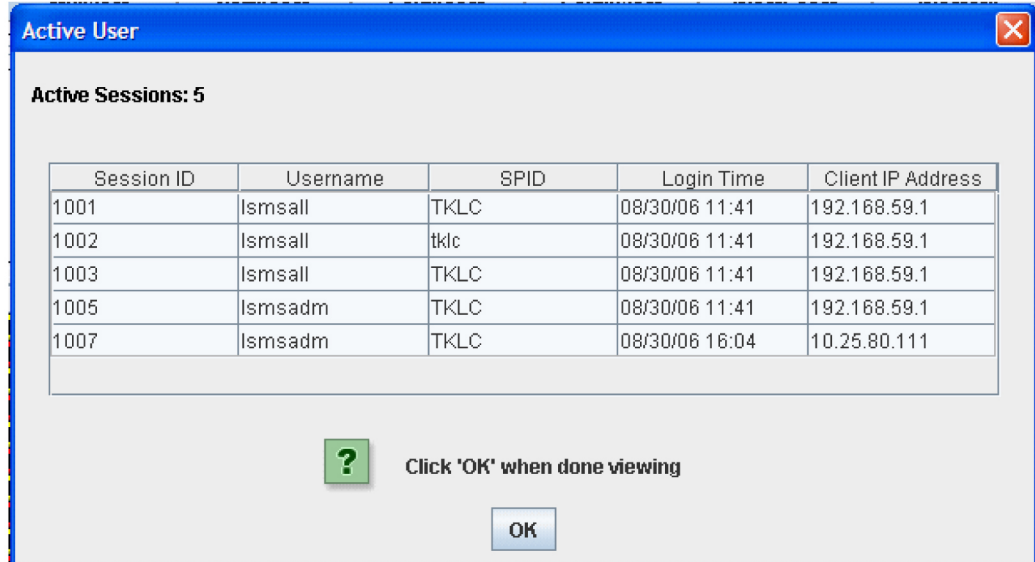
1. Log in to the **LSMS Console** as a user in the `lsmsadm` or `lsmsall` group.
2. From the main menu, select **User/Session**, and then **View Active User Sessions**.

**Figure 3-41** Select User/Session, and then View Active User Sessions



3. After clicking **View Active User Sessions**, the View Active User Sessions dialog displays.

**Figure 3-42** View Active User Sessions Dialog



**Note:**

Timed-out sessions are included in the active sessions list.

4. Click **OK** when you are done viewing the Active User list.

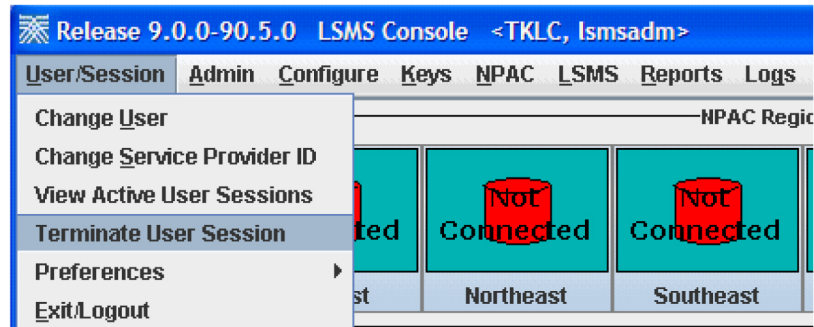


### 3.6.3.10 Terminating an Active User Session

Use the following procedure to terminate the session of an active **LSMS GUI** User:

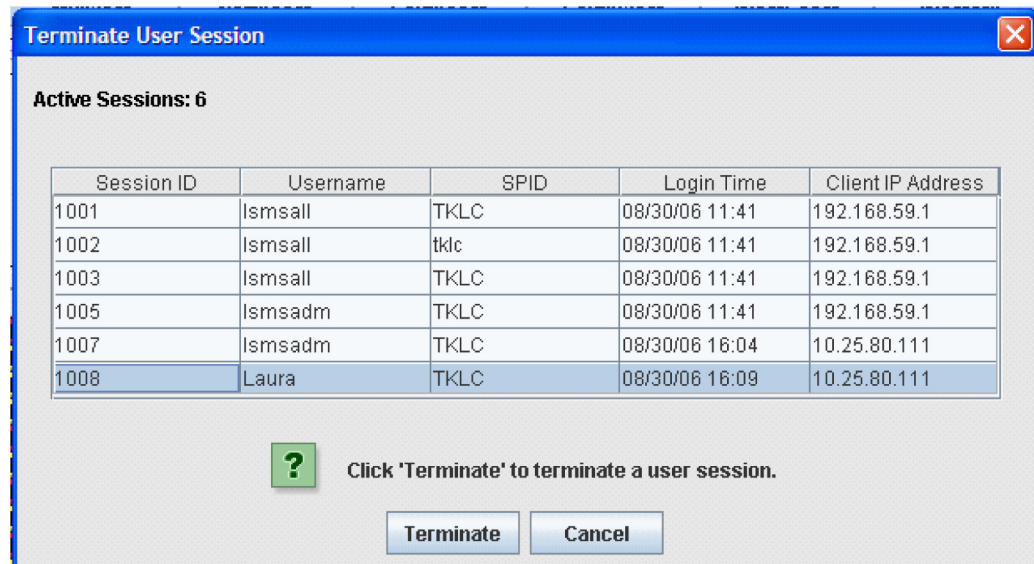
1. Log in to the **LSMS Console** as a user in the `lsmsadm` or `lsmsall` group.
2. From the main menu, select **User/Session**, and then **Terminate User Session**.

**Figure 3-43** Select User/Session, and then Terminate User Session

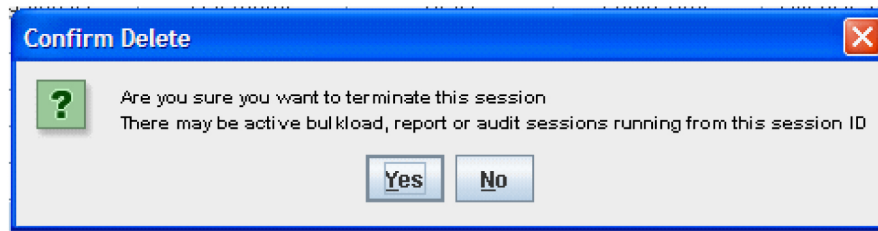


3. After clicking **Terminate User Session**, the Terminate User Session dialog displays.

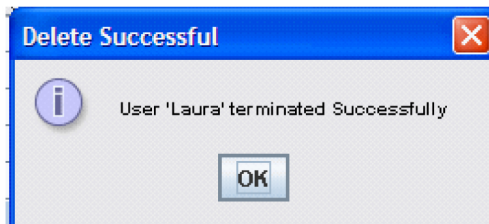
**Figure 3-44** Terminate User Session Dialog



4. Click on the user session you want to end and click **Terminate**.
5. If you are sure you want to terminate the session, click **Yes** in the Confirm Delete dialog, otherwise click **No**.

**Figure 3-45 Confirm Delete Dialog**

6. After you successfully terminate a user session, click **OK** in the Delete Successful dialog.

**Figure 3-46 Delete Successful Dialog**

### 3.6.4 Activating the SPID Security Feature

This feature is activated by Oracle customer service using secure activation procedures. Once the feature is activated, the following actual usernames (not user group names) are defined to be “golden users” having access to all **SPID** and all other usernames are defined to have no access to any **SPIDs**:

- `lmsadm`
- `lmsview`
- `lmsall`
- `lmsuser`
- `lmsuext`

After the feature has been activated, the **LSMS** administrator (`lmsadm`) is advised to immediately define associations between usernames and **SPIDs** as described in the following procedure:

1. Log in as `lmsadm` on the active server.
2. If you do not wish the username `lmsadm` to have access to all **SPIDs**, enter the following command to remove the username from golden access:  

```
$ spidsec -r -u lmsadm -s golden
```
3. If desired, repeat step 2 for the usernames `lmsview`, `lmsall`, `lmsuser`, and `lmsuext`.
4. To display all the usernames currently defined on the **LSMS**, see [Displaying All LSMS User Accounts](#).
5. For each displayed username, determine which **SPIDs** you wish to allow this user access to and enter the following command to authorize this username for the specified **SPID**:

```
$ spidsec -a -u <username> -s {<spid>|golden}
```

The following parameters and options apply to this command:

**<username>**

A valid **LSMS** username that has been provisioned using admintool

**<spid>**

A valid **SPID** defined on the **LSMS** (alternatively, you can enter `golden` to allow this username access to all **SPIDs** defined on the **LSMS**)

To authorize this username to multiple **SPIDs**, but not for all **SPIDs**, you must enter the command once for each **SPID**.

6. Repeat step 5 for each user displayed in step 4.

## 3.7 Accessing GUI on Java8

Perform the following steps to access LSMS GUI on the latest java8 release.

1. Modify the `java.security` file.
2. Modify the `java.security` file as Administrator. It is located in Windows `C:\Program Files (x86)\Java\jre1.8.0_351\lib\security\java.security`. Search for and comment on the following lines: `jdk.jar.disabledAlgorithms=MD2, MD5, RSA keySize < 1024, \` and find the following lines and comment these lines in `java.security` file:

**Figure 3-47** Modify the `java.security` file

```
jdk.jar.disabledAlgorithms=MD2, MD5, RSA keySize < 1024, \
DSA keySize < 1024, include jdk.disabled.namedCurves, \
SHA1 denyAfter 2019-01-01
```

# 4

## Preventive Maintenance

This chapter describes preventive maintenance of the **LSMS**. Included are topics on backing up databases and file systems, monitoring hardware and network performance, and routine cleaning.

### 4.1 Introduction

This chapter describes preventive maintenance of the **LSMS**. Included are topics on backing up databases and file systems, monitoring hardware and network performance, and routine cleaning.

Use the system monitoring features regularly, especially during times of peak load, to verify that the system has adequate resources. This practice provides an insight into system resource utilization and provides early warning if the system capacity limits are being approached.

The procedures in this chapter assume that you are familiar with the **LSMS** hardware. For more information about the hardware, refer to *Application B Card Hardware and Installation Guide*.

### 4.2 Recommended Daily Monitoring

To properly maintain your **LSMS** system, it is recommended that you perform the activities described in this section on a daily basis.

#### Continuous Monitoring Activities

Perform the following activities continually:

- Always keep at least one graphical user interface (**GUI**) open. Monitor the **GUI** especially for any red or yellow conditions, either on the **NPAC** and **EMS** status icons or in the notifications display area. For more information about the display areas of the **GUI**, refer to the *Database Administrator's Guide*. For information about notifications displayed in the notifications display area, see [Automatic Monitoring of Events](#).
- Monitor the latest Surveillance notifications in either or both of the following ways:
  - Connect a customer-provided administration console to Serial Port 3 of each server so that Surveillance notifications can be displayed there.
  - View the Surveillance log file, `/var/TKLC/lsms/logs/survlog.log`. To display the latest contents of this file, log in as any user and enter the following command:

```
$ tail -f /var/TKLC/lsms/logs/survlog.log
```

For more information about the Surveillance feature, see [“Understanding the Surveillance Feature”](#).

#### 4.2.1 Once a Day Monitoring Activities

It is recommended that once each day you perform the following:

- Examine logs for abnormalities. For more information, see [Daily Examination of Logs for Abnormalities](#).
- Determine the success or failure of the database and file system backups by examining the backup log (`/var/TKLC/log/backup/backup.log`) and the surveillance log (`/var/TKLC/lsmc/logs/survlog.log`). For more information, see [Daily Determination of Success or Failure of Backup](#).

**Note:**

Logs are maintained up to 20 MB for rejected logs and 500 MB for transaction logs. The old rotated logs get deleted automatically in a day and new logs start getting pegged in the newly created files.

### Daily Examination of Logs for Abnormalities

Examine the following logs for any abnormalities once a day, preferably near the end of the day. In each of these logs, `<MMDD>` indicates the month and day. Each log is kept for seven days. For more information about these logs, refer to the *Database Administrator's Guide*. You can view the logs using the **GUI** or you can use any text editor.

- Examine the following exception log files:
  - Run the `chkfilter` command and then examine `/var/TKLC/lsmc/logs/trace/LsmcSubNotFwd.log.<MMDD>`. This log contains subscription versions (**SVs**) or number pool blocks (**NPBs**) that have been received from an **NPAC** but could not be forwarded to a network element because the **LSMS** has no **EMS** routing defined for the **SVs** or **NPBs**.
  - `/var/TKLC/lsmc/logs/<clli>/LsmcRejected.log.<MMDD>`. This log contains transactions that the **LSMS** attempted to forward to a network element, but which were rejected by the network element.
- Examine the following alarm logs to verify that you are aware of all alarms (these events will also have been reported in the **GUI** notifications display).
  - `/var/TKLC/lsmc/logs/alarm/LsmcAlarm.log.<MMDD>`. This log contains events associated with the Local Data Manager, the Local Services Manager and regional **NPAC** agent processes.
- Examine the following transaction logs for any abnormalities:
  - `/var/TKLC/lsmc/logs/<clli>/LsmcTrans.log.<MMDD>` for each network element identified by `<clli>`. These logs contain all transactions forwarded to **EMS** agents, including information associated with M-Create, M-Set, and M-Delete operations initiated from the **NPAC**.
- Examine the Surveillance log `/var/TKLC/lsmc/logs/survlog.log` for any abnormalities. This log contains all surveillance notifications that have been posted.

### Daily Determination of Success or Failure of Backup

Each day, check the backup log from the previous day on each server (as you can see from the timestamps in [Figure 4-1](#) and [Figure 4-2](#), backups generally begin a few minutes before midnight). Ensure that the backup logs contain text similar to that shown in the referenced figures. If you need help interpreting the logs, contact My Oracle Support.

If you determine that the automatic backup(s) did not complete successfully, perform a manual backup right away.

## 4.3 LSMS Database Defragmentation

In releases of LSMS prior to 13.0, a database sort was sometimes required to keep the LSMS operating at maximum efficiency in terms of transactions per second (TPS). This was a manually-intensive operation that could be performed only by the Technical Assistance Center (TAC). LSMS 13.0 and later releases use the E5-APP-B platform, which has solid state drives (the old platform used disk drives) that by design do not require defragmentation. Oracle performed testing to validate that fragmentation will not be an issue on the E5-APP-B platform. However, if for some reason there is any indication of a need for database sorting, contact My Oracle Support so your system can be fully evaluated. If it is determined there is a need for database sorting, the Customer Care Center has access to MO006201 which defines this database sort procedure.

## 4.4 Using Backup Procedures

The most basic form of backup happens continuously and automatically, as the redundant **LSMS** servers contain duplicate hardware, and the standby server replicates the active server's database.

However, if data becomes corrupted on the active server's database, because data on the active server's database is automatically replicated to the standby server, you must also follow more conventional backup procedures so that you can recover from a corrupted database. A database saved to file on the Network Attached Storage (**NAS**) device or copied from the disk to tape on the **NAS** and then stored off-site is a precaution against database corruption.

### 4.4.1 Understanding How the LSMS Backs Up File Systems and Databases

Each night at midnight, the **LSMS** automatically backs up the following to disk:

- Platform configuration (for each server), stored as `plat.xml`
- The entire **LSMS** database, stored as `lsmsdb.xml`
- The entire **LSMS** logs filesystem, stored as `lsmslogs.xml`

When both servers are functioning, the automatic backup function backs up the database (`lsmsdb.xml`) and logs (`lsmslogs.xml`) from the standby server, and backs up only the platform configuration (`plat.xml`) from the active server.

If only one server is active, the automatic backup function backs up all the files shown in the bulleted list above from the active server.

In addition, you can perform the same backups manually at any time (see [Backing Up the LSMS Manually](#)).

### 4.4.2 Understanding the Backup Results

The result of each backup is posted to the log file on the server on which the backup was scheduled to take place.

1. Log into the server as `lsmsview`.
2. At the command line prompt, enter the following command to view the log:  

```
more /var/TKLC/log/backup/backup.log
```
3. Output:

- a. The example backup log for the standby server indicates that on Wednesday, December 7, an automatic backup was performed on the standby server.

After completing the backup task for each respective backup type (platform, database, and logs), an entry was generated and stored in the backup log. If the backup was successful, output similar to the following displays:

**Figure 4-1 Example of Successful Backup Log for STANDBY Server**

```
lsmsbkbp:*** Backup started at Wed Dec 7 23:55:04 EST 2005 ***
lsmsbkbp: Local HA status: STANDBY.
lsmsbkbp: Remote HA status: ACTIVE.

lsmsbkbp: Backup type: Platform.

lsmsbkbp: Backup type: DataBase.

lsmsbkbp: Backup type: Logs.
```

-----

The example backup log for the active server indicates that on Wednesday, December 7, an automatic backup was also performed on the active server. After completing the backup task for the platform files, an entry was generated and stored in the backup log. If the backup was successful, output similar to the following displays:

**Figure 4-2 Example of Successful Backup Log for ACTIVE Server**

```
lsmsbkbp:*** Backup started at Wed Dec 7 23:55:05 EST 2005 ***
lsmsbkbp: Local HA status: ACTIVE.
lsmsbkbp: Remote HA status: STANDBY.

lsmsbkbp: Backup type: Platform.
```

-----

- b. If the backup was unsuccessful, output similar to the following displays:

**Figure 4-3 Example of Unsuccessful Backup Log for ACTIVE Server**

```
lsmsbkbp:*** Backup started at Thu Jan 12 14:03:52 EST 2006 ***
lsmsbkbp: Local HA status: ACTIVE.
lsmsbkbp: Remote HA status: STANDBY.

lsmsbkbp: Backup type: Platform.

ERROR: Remote command failed: RC=1
ERROR: reported: ssh: connect to host backupserver-lmspri port 22: No route to
host

WARNING: Could not create lockfile /Volumes/LVstorage/LOCK.lmspri
err | Repository is already locked!
```

## 4.4.3 Backing Up the LSMS Manually

Before beginning a manual backup:

- Read [Understanding How the LSMS Backs Up File Systems and Databases](#).
- Check the **GUI** notification information and surveillance logs for database errors before beginning the manual backup procedure to ensure that the **LSMS** is functioning correctly.
- Check whether servdi is running before starting the manual backup. If servdi is running, wait for it to complete before running the manual backup.



### Note:

Backups can also be performed via the platcfg menu. For more information, see [Using Restore Procedures](#).

The following procedure explains how to start a backup manually. If a backup procedure fails, contact My Oracle Support.

1. Perform the procedure described in [“Checking for Running Backups”](#) to ensure that no other backup (automatic or manual) is already running.
2. Ensure that none of the following processes are running.

All of these processes use temporary file space on the **LSMS**. If you attempt to start a backup, you may run out of file space.

- Starting a standby node (to change its state from **UNINITIALIZED "INHIBITED"** to **STANDBY**)
- An `import` command
- An `lsmstdb quickaudit` command
- A query server snapshot (`lsmstdb snapshot`)

3. Log into the active server as `lsmmgr`.

(For more information, see [“Logging In to LSMS Server Command Line”](#).)

4. View the backup log and ensure that the backup completed successfully.



### Note:

The backup log shows only the active server’s backup results.

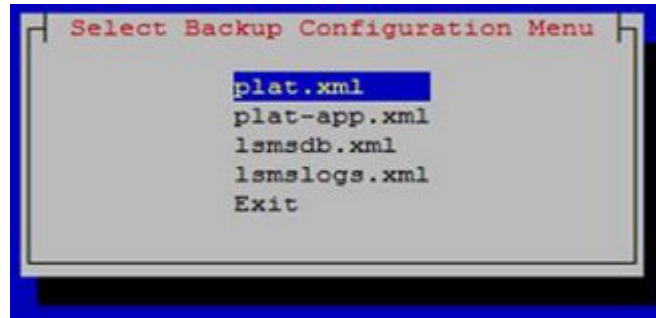
For more information, see [Daily Determination of Success or Failure of Backup](#).

5. From the Main Menu on the active server, select **Maintenance**, and then **Backup and Restore**, and then **Network Backup**.

The Select Backup Configuration Menu is displayed.



**Figure 4-4 Select Backup Configuration Menu**

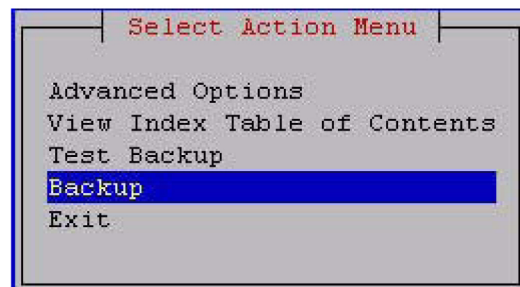


- **plat.xml** is provided by TPD and is used to back up all platform files (such as log, pkg, and rcs files) from LSMS to NAS.
- **plat-app.xml** is provided by LSMS and is used to back up all platform files (such as log, pkg, and rcs files) from LSMS to NAS.
- **lsmsdb.xml** is used to back up the LSMS database on NAS.
- **lsmslogs.xml** is used to back up the LSMS logs on NAS.
- **Exit** returns control to the Backup and Restore menu.

Select **plat.xml** as shown.

6. Press **Enter** and the Select Action Menu is displayed.

**Figure 4-5 Select Backup on Active Server**



- **Advanced Options** enables specification of backup host details, the archive directory, the repository, and other options. For example:

```

Backup Host: backupserver
Backup Host user: root
Archive directory: /Volumes/LVstorage
Repository: logs (automatically selected based on the type of backup
selected previously)
Depth: 5 (numerical value, use of 1-5 is suggested)
Prune: (*)Yes or ()No

```

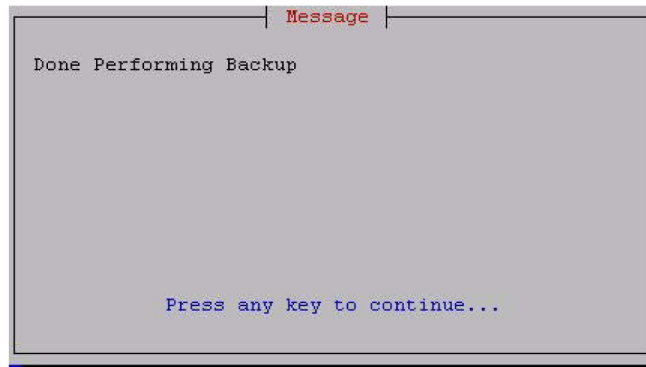
- **View Index Table of Contents** lists the data to be backed up.
- **Test Backup** performs a test backup.

- **Backup** performs backup of LSMS data on NAS.
- **Exit** returns control to the Backup and Restore menu.

Select **Backup** as shown.

7. When the backup is complete, press any key to continue.

**Figure 4-6 Backup Complete on Active Server**



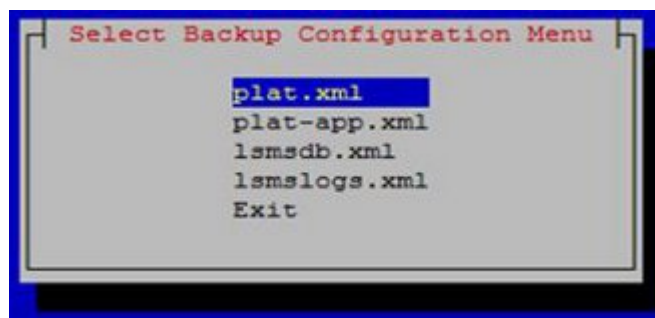
8. Log into the standby server as **lsmsmgr**.  
(For information, see [“Logging in from One Server to the Mate’s Command Line”](#).)

 **Note:**

If the standby server is not functional, perform the rest of the procedures on the active server.

9. Select **plat.xml** on the standby server, and press **Enter**.

**Figure 4-7 Select plat.xml on Standby Server**



10. Select **Backup**.

**Figure 4-8 Select Backup on Standby Server**

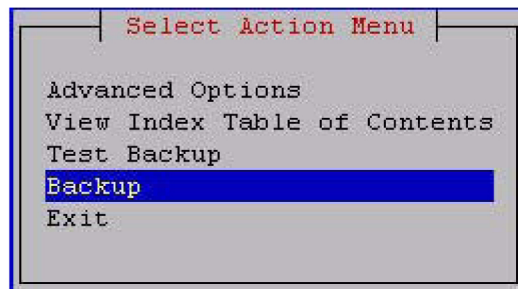
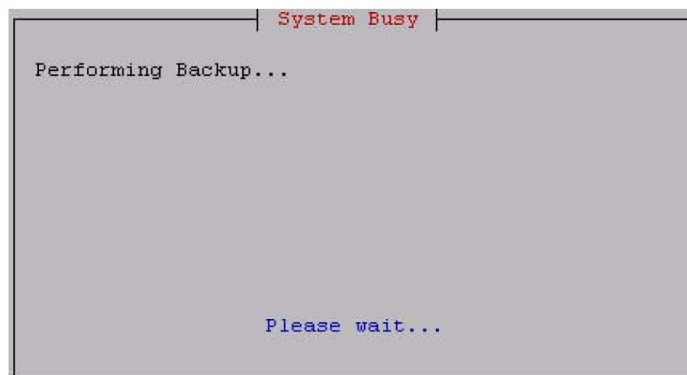
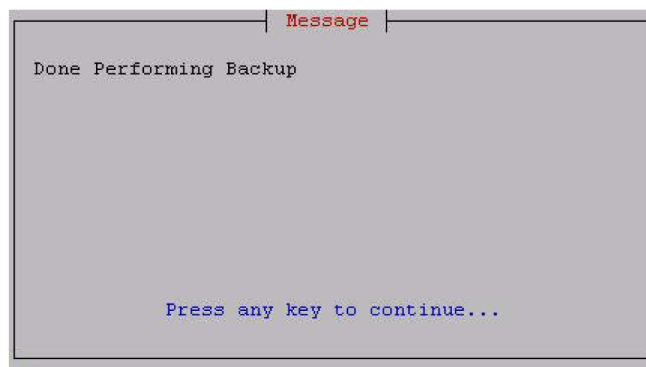


**Figure 4-9 Performing Backup Screen**



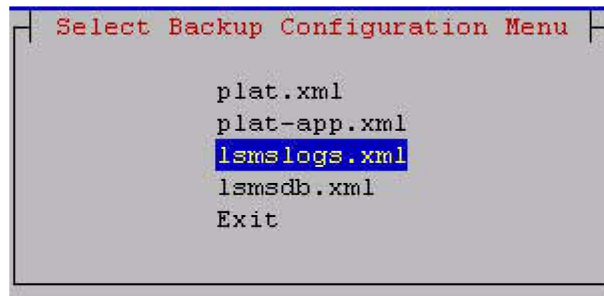
11. When the backup is complete, press any key to continue.

**Figure 4-10 Backup Complete on Standby Server**



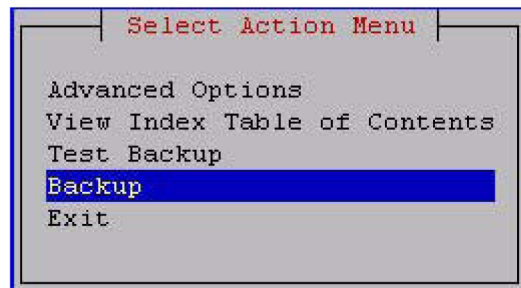
12. Select **lsmslogs.xml** on the standby server, and press **Enter**.

**Figure 4-11 Select lsmlogs.xml on Standby Server**



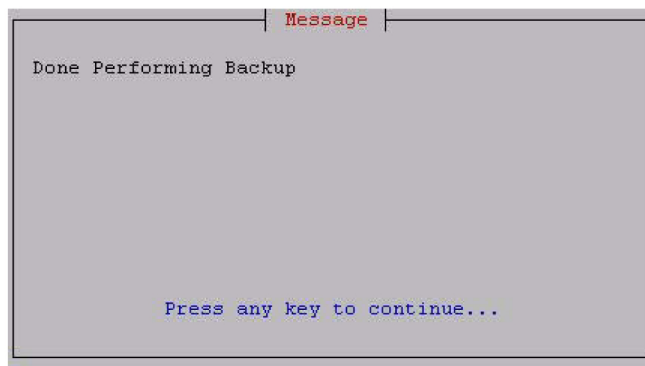
13. Select **Backup**.

**Figure 4-12 Select Backup on Standby Server**



14. When the backup is complete, press any key to continue.

**Figure 4-13 Backup Complete on Standby Server**



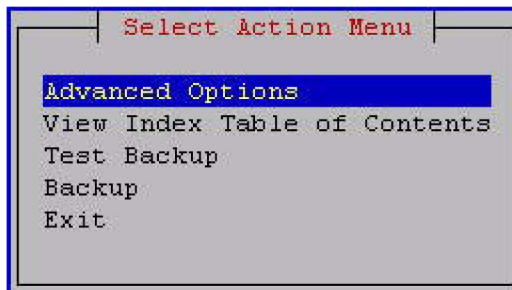
15. Select **lmsdb.xml**, and press **Enter**.

**Figure 4-14 Select lsmsdb.xml on Standby Server**



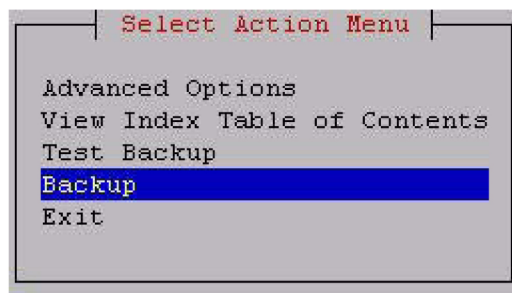
16. When the server has completed loading the **Select Action Menu** displays.

**Figure 4-15 Select Action Menu**

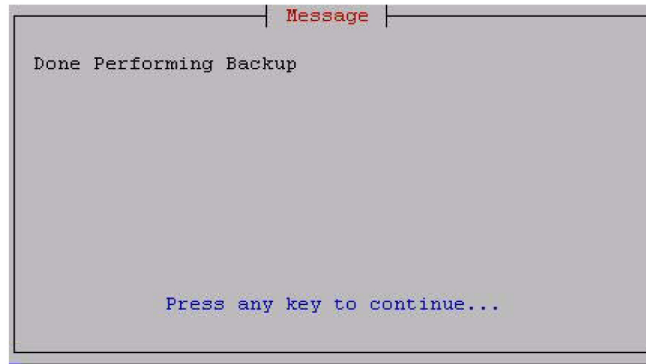


17. Select **Backup**, and press **Enter**.

**Figure 4-16 Backup**



18. When the backup completes, press any key to continue.

**Figure 4-17 Backup Complete**

You can now exit to the Main Menu, or choose another menu item.

## 4.4.4 Stopping an Automatic or Manual Backup

Under normal conditions, backups complete relatively quickly (in less than 45 minutes). However, if no backup has been previously performed or if the previous backup was stopped before it completed, the next backup can take up to 4 hours.

It is advisable to allow a backup to complete. However, if you accidentally start a backup or need to stop the backup process, use the following procedure. You must log into both the active and standby servers to stop a backup.

Note that a backup cannot restart at the point where it was aborted because various lock files are created to prevent conflicting backups. To restart a manual backup, start the procedure from the beginning. See [“Backing Up the LSMS Manually”](#) if you need help.

If you need to restore data from a previously recorded backup, contact My Oracle Support.

1. Log in as `root` on active server.
2. To find the process **ID** of the processes involved in backing up the databases, enter the following command:

```
ps -ef | egrep "rsync|netbackup|lsmsbcp" | grep -v grep
```

The output from the above command includes the process **ID (PID)**, also referred to as the job number, for each process that has the characters `rsync`, `netbackup`, or `lsmsbcp` in its name. Note the first **PID** (shown in **bold text** in the following example) displayed on the line for each process.

```
root 5673 32428 0 13:43 pts/0 00:00:00 /bin/sh
/usr/TKLC/lsms/tools/lsmsbcp
root 5759 5673 4 13:43 pts/0 00:00:00 /usr/bin/perl -T
/usr/TKLC/plat/bin/netbackup
--config=/usr/TKLC/plat/etc/BackupTK/plat.xml
root 5942 5759 25 13:43 pts/0 00:00:00 /usr/bin/rsync --archive
--delete --delete-excluded --relative --sparse --files-from=
--rsh=/usr/bin/ssh /
root@backupserver-lsmssec:/Volumes/LVstorage/lsmssec/00-Oct21_13:43
root 5943 5942 12 13:43 pts/0 00:00:00 /usr/bin/ssh -l root
```

```
backupserver-lsmssec rsync --server -logDtpRS --delete-excluded .
/Volumes/LVstorage/lmssec/00-Oct21_13:43
```

3. To stop the backup, enter the following command:

```
kill <jobnumber1> <jobnumber2> ...
```

where <jobnumber1> is the **PID** of the first process to stop and <jobnumber2> is the **PID** of the second process to stop. Enter a job number for each line that displays in step 2. For the example output in step 2, enter the following command:

```
kill 5673 5759 5942 5943
```

4. Verify that all relevant processes have been stopped by entering the following command and ensuring that no output appears:

```
ps -ef | egrep "rsync|netbackup|lmsbkbp" | grep -v grep
```

If no output appears, the backup has been stopped.

5. Clean up any remaining lock files by entering the following command:

```
rm -f /TOC
```

6. Repeat steps 1 through 5 on the standby server to stop that server's backup.

7. To clear up any lingering lock files on the **NAS**, enter the following command on either server:

```
ssh backupserver /etc/rc3.d/S99TKLCclearlocks start
```

When the **OK** in the following output displays, all lock files on the **NAS** have been cleared.

```
Clearing backup locks:[OK]
```

## 4.4.5 Checking for Running Backups

Both database backups and query server snapshots use the same file space on the **LSMS**. If a backup is in process and a query server snapshot or another backup is started, the first backup process will terminate prematurely, and the next backup will take significantly longer to complete. Therefore, it is very important that you perform the following procedure to check for a running backup before starting a manual backup or creating a query server snapshot.

In addition, the following tasks all use temporary file space on the **LSMS**. If you attempt to run these processes simultaneously, you may run out of disk space. Since backups can be run automatically, it is recommended that you perform the following procedure before attempting any of these tasks to ensure that no database backups are running:

- Starting a standby node (changing its state from **UNINITIALIZED "INHIBITED"** to **STANDBY**)
  - Running the `import` command
  - Running the `lmsbdb quickaudit` command.
1. Log in as the `lmsadm` or `lmsall` user to the active server (for information about logging in, see [“Logging In to LSMS Server Command Line”](#)).
  2. Enter the following command to determine whether any database backups are running:

```
$ ps -ef | grep netbackup
```

- If output similar to the following displays (only `grep netbackup` displays after 00:00:00), no backup is running, and you may continue with the procedure you were performing:

```
lsmsadm 6826 6312 0 16:58 pts/12 00:00:00 grep netbackup
```

- If output similar to the following displays (with one or more processes after 00:00:00), a backup is running. **DO NOT** proceed with the procedure that you are performing. (This output displays all on one line although it does not fit on one line in this manual.)

```
lsmsadm 25742 25596 0 11:20 ? 00:00:00 /usr/bin/perl -T /usr/
TKLC/plat/bin/netbackup --config=/usr/TKLC/plat/etc/BackupTK/lsmsdb.xml
```

#### ⚠ Caution:

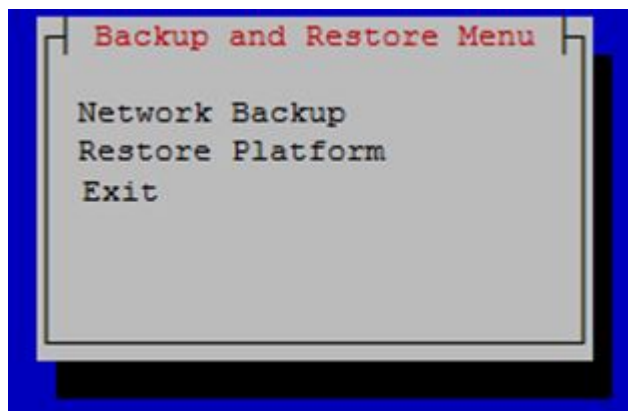
While a backup is in progress, do not attempt to start a standby node (change its state from **UNINITIALIZED "INHIBITED"** to **STANDBY**), run the `import` command, run the `lsmsdb quickaudit` command, create a query server snapshot, or start another backup. All of these tasks use temporary file space. If you attempt to start one of these processes, you may run out of disk space.

Before restarting or attempting to proceed with the procedure you were performing, run the command in this step again.

## 4.5 Using Restore Procedures

The `platcfg` utility provides for network backup and restore operations. From the Main Menu, selecting **Backup and Restore** displays the Backup and Restore menu as shown.

Figure 4-18 Backup and Restore Menu



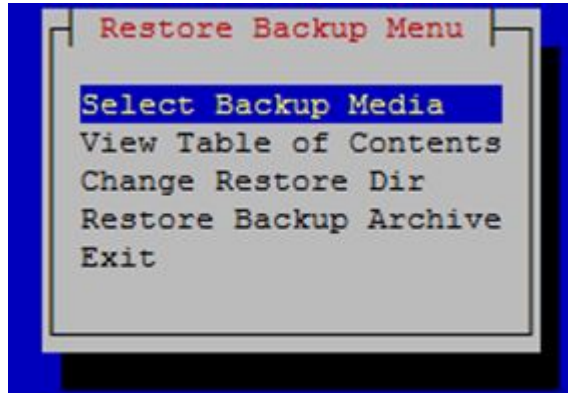
- **Network Backup** works in the same way as it does for `lsmsmgr`. For more information, see [Backing Up the LSMS Manually](#).



- **Restore Platform** enables restoration of data from NAS to LSMS.

Selecting **Restore Platform** transfers control to the Restore Backup Menu as shown.

**Figure 4-19 Restore Backup Menu**



- **Select Backup Media** enables selection of the backup archive to be restored from NAS to LSMS.
- **View Table of Contents** displays the contents of the selected backup archive. If no backup archive is selected, a message is displayed indicating that you must select the media first.
- **Change Restore Dir** is used to indicate the restore directory to which the archive will be restored.
- **Restore Backup Archive** restores the selected archive from NAS to LSMS. If no backup archive is selected, a message is displayed indicating that you must select the media first.

To restore the data from NAS when the servers are in active/standby state, follow these steps:

1. On the standby server, open the lsmsmgr menu using the following command:

```
su - lsmsmgr
```

2. Select **Maintenance**, and then **Stop Node**.
3. Repeat steps 1 and 2 on the active server.
4. Start restore from NAS on the active server from the platcfg menu (**Backup and Restore**, and then **Restore Platform**).
5. After restore, issue the following command on both the A and B servers:

```
rm -rf /var/TKLC/lsms/db/auto.cnf
```

6. On the active server, open the lsmsmgr menu using the following command:

```
su - lsmsmgr
```

7. Select **Maintenance**, and then **Start Node**.
8. Repeat steps 6 and 7 on the standby server.

## 4.6 Additional Tools for Monitoring the LSMS Hardware and the Network

**LSMS** provides various tools that you can use to monitor the **LSMS** hardware and the network. Monitoring can help you prevent and diagnose errors.

Use the system monitoring features regularly, especially during times of peak load, to verify that the system has adequate resources. This practice provides an insight into system resource utilization and provides early warning if the system capacity limits are being approached.

### 4.6.1 Verifying Active Server Network Interfaces and NPAC Connections

Use one or more of the following methods to verify network connectivity:

- The `ifconfig` command
- The `traceroute` utility to verify network connectivity and routing between hosts
- The **LSMS** graphical user interface (**GUI**) to determine connectivity to **NPACs**

#### 4.6.1.1 Using the `ifconfig` Command

Use the `ifconfig -a` command on the target host to verify that ports are in the **UP** state.

1. Log in as `root` on the active server.
2. Enter the following command to test the interfaces:

```
ifconfig -a
```

Verify the output. The successful completion is indicated by the word **UP** in the output, which is highlighted in **bold** in [Figure 4-20](#) and [Figure 4-21](#). A failure is indicated by the absence of the word **UP** in the output.

**Figure 4-20 Single Subnet Configuration**

```

bond0 Link encap:Ethernet HWaddr 00:00:17:0F:2D:06
 inet addr:192.168.1.1 Bcast:192.168.1.255 Mask:255.255.255.0
 inet6 addr: fe80::200:17ff:fe0f:2d06/64 Scope:Link
 UP BROADCAST RUNNING MASTER MULTICAST MTU:1500 Metric:1
 RX packets:13234317 errors:0 dropped:0 overruns:0 frame:0
 TX packets:49892404 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:930274679 (887.1 MiB) TX bytes:2323295112 (2.1 GiB)

bond0.2 Link encap:Ethernet HWaddr 00:00:17:0F:2D:06
 inet addr:192.168.2.1 Bcast:192.168.2.255 Mask:255.255.255.0
 inet6 addr: fe80::200:17ff:fe0f:2d06/64 Scope:Link
 UP BROADCAST RUNNING MASTER MULTICAST MTU:1500 Metric:1
 RX packets:42010 errors:0 dropped:0 overruns:0 frame:0
 TX packets:43401 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:8261939 (7.8 MiB) TX bytes:9152913 (8.7 MiB)

```

```

eth0 Link encap:Ethernet HWaddr 00:00:17:0F:2D:04
 inet addr:192.168.60.11 Bcast:192.168.60.255 Mask:255.255.255.0
 inet6 addr: fd0d:deba:d97c:a0:200:17ff:fe0f:2d04/64 Scope:Global
 inet6 addr: fe80::200:17ff:fe0f:2d04/64 Scope:Link
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
 RX packets:85601 errors:0 dropped:0 overruns:0 frame:0
 TX packets:145415 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:18515983 (17.6 MiB) TX bytes:27768794 (26.4 MiB)

eth1 Link encap:Ethernet HWaddr 00:00:17:0F:2D:05
 inet addr:192.168.3.1 Bcast:192.168.3.255 Mask:255.255.255.0
 inet6 addr: fe80::200:17ff:fe0f:2d05/64 Scope:Link
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
 RX packets:1851 errors:0 dropped:0 overruns:0 frame:0
 TX packets:1867 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:144660 (141.2 KiB) TX bytes:124694 (121.7 KiB)

eth2 Link encap:Ethernet HWaddr 00:00:17:0F:2D:06
 UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1
 RX packets:13234314 errors:0 dropped:0 overruns:0 frame:0
 TX packets:49892392 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:930274503 (887.1 MiB) TX bytes:2323294344 (2.1 GiB)

eth3 Link encap:Ethernet HWaddr 00:00:17:0F:2D:06
 UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1
 RX packets:3 errors:0 dropped:0 overruns:0 frame:0
 TX packets:12 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:176 (176.0 b) TX bytes:768 (768.0 b)

lo Link encap:Local Loopback
 inet addr:127.0.0.1 Mask:255.0.0.0
 inet6 addr: ::1/128 Scope:Host
 UP LOOPBACK RUNNING MTU:16436 Metric:1
 RX packets:1658459 errors:0 dropped:0 overruns:0 frame:0
 TX packets:1658459 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:126522800 (120.6 MiB) TX bytes:126522800 (120.6 MiB)

```

**Figure 4-21 Segmented Network Configuration**

```

bond0 Link encap:Ethernet HWaddr 00:00:17:0F:2F:12
 inet addr:192.168.1.1 Bcast:192.168.1.255 Mask:255.255.255.0
 inet6 addr: fe80::200:17ff:fe0f:2f12/64 Scope:Link
 UP BROADCAST RUNNING MASTER MULTICAST MTU:1500 Metric:1
 RX packets:13242602 errors:0 dropped:0 overruns:0 frame:0
 TX packets:50173237 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:972152478 (927.1 MiB) TX bytes:2368284409 (2.2 GiB)

```

```

bond0.2 Link encap:Ethernet HWaddr 00:00:17:0F:2F:12
 inet addr:192.168.2.1 Bcast:192.168.2.255 Mask:255.255.255.0
 inet6 addr: fe80::200:17ff:fe0f:2f12/64 Scope:Link
 UP BROADCAST RUNNING MASTER MULTICAST MTU:1500 Metric:1
 RX packets:90623 errors:0 dropped:0 overruns:0 frame:0
 TX packets:97130 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:17963083 (17.1 MiB) TX bytes:20655848 (19.6 MiB)

bond1 Link encap:Ethernet HWaddr 00:00:00:00:00:00
 BROADCAST MASTER MULTICAST MTU:1500 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

bond2 Link encap:Ethernet HWaddr 00:00:00:00:00:00
 BROADCAST MASTER MULTICAST MTU:1500 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

bond3 Link encap:Ethernet HWaddr 00:00:00:00:00:00
 BROADCAST MASTER MULTICAST MTU:1500 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

eth0 Link encap:Ethernet HWaddr 00:00:17:0F:2F:10
 inet addr:192.168.60.14 Bcast:192.168.60.255 Mask:255.255.255.0
 inet6 addr: fd0d:deba:d97c:a0:200:17ff:fe0f:2f10/64 Scope:Global
 inet6 addr: 2606:b400:605:b80c:200:17ff:fe0f:2f10/64 Scope:Global
 inet6 addr: fe80::200:17ff:fe0f:2f10/64 Scope:Link
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
 RX packets:13981300 errors:0 dropped:0 overruns:0 frame:0
 TX packets:78201 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:3815515378 (3.5 GiB) TX bytes:7623582 (7.2 MiB)

eth1 Link encap:Ethernet HWaddr 00:00:17:0F:2F:11
 inet addr:192.168.3.1 Bcast:192.168.3.255 Mask:255.255.255.0
 inet6 addr: fe80::200:17ff:fe0f:2f11/64 Scope:Link
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
 RX packets:559584 errors:0 dropped:0 overruns:0 frame:0
 TX packets:1805629 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:42998514 (41.0 MiB) TX bytes:860763886 (820.8 MiB)

eth1.<vlan ID 1> Link encap:Ethernet HWaddr 00:00:17:0F:2F:11
 inet addr:192.168.59.18 Bcast:192.168.59.255 Mask:255.255.255.0
 inet6 addr: 2606:b400:605:b80a:200:17ff:fe0f:2f11/64 Scope:Global
 inet6 addr: fe80::200:17ff:fe0f:2f11/64 Scope:Link
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
 RX packets:47462 errors:0 dropped:0 overruns:0 frame:0

```

```

TX packets:3341 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:2481722 (2.3 MiB) TX bytes:272370 (265.9 KiB)

eth1.<vlan ID 2> Link encap:Ethernet HWaddr 00:00:17:0F:2F:11
inet addr:192.168.61.53 Bcast:192.168.61.255 Mask:255.255.255.0
inet6 addr: 2606:b400:605:b80b:200:17ff:fe0f:2f11/64 Scope:Global
inet6 addr: fe80::200:17ff:fe0f:2f11/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:502309 errors:0 dropped:0 overruns:0 frame:0
TX packets:1328746 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:31914086 (30.4 MiB) TX bytes:813991760 (776.2 MiB)

eth2 Link encap:Ethernet HWaddr 00:00:17:0F:2F:12
UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1
RX packets:13242602 errors:0 dropped:0 overruns:0 frame:0
TX packets:50173237 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:972152478 (927.1 MiB) TX bytes:2368284409 (2.2 GiB)

eth3 Link encap:Ethernet HWaddr 00:00:17:0F:2F:12
UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1
RX packets:0 errors:0 dropped:0 overruns:0 frame:0
TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

lo Link encap:Local Loopback
inet addr:127.0.0.1 Mask:255.0.0.0
inet6 addr: ::1/128 Scope:Host
UP LOOPBACK RUNNING MTU:16436 Metric:1
RX packets:1223316 errors:0 dropped:0 overruns:0 frame:0
TX packets:1223316 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:92431234 (88.1 MiB) TX bytes:92431234 (88.1 MiB)

sit0 Link encap:IPv6-in-IPv4
NOARP MTU:1480 Metric:1
RX packets:0 errors:0 dropped:0 overruns:0 frame:0
TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

```

### 4.6.1.2 Using the `traceroute` Utility

The `traceroute` utility determines the path between the host where the utility is run and the remote host named by the utility's input parameter. The utility also reports the latency of each hop along the route.



#### Note:

If the network between the hosts contains firewalls, this utility may fail unless the firewalls are properly set up. Setting up firewalls is the responsibility of the customer.

Use the following procedure to run the `traceroute` utility:

1. Log in as the `lsmsmgr` user on the server from which you want to test the route.  
(For information, see [“Logging In to LSMS Server Command Line”](#).)
2. From the `lsmsmgr` interface, select **Diagnostics**, and then **Network Diagnostics**, and then **Traceroute**.

**Figure 4-22 TraceRoute**

Run Traceroute

Hostname/IP Address:

Type: ☒ (\*) auto ☐ ( ) IPv4 ☐ ( ) IPv6

Interface (optional):

OK Cancel

3. Ensure the cursor is placed in the **Hostname/IP Address** field, and type the **IP** address of the system to which you wish to trace the route, then use the down arrow key to highlight the **OK** button, and press **Enter**.

The results display in a window similar to the following.

**Figure 4-23 TraceRoute Results**

Traceroute Results

traceroute to 192.168.60.60 (192.168.60.60), 30 hops max, 40 byte packets

1 (192.168.60.60) 2.994 ms 3.074 ms 3.163 ms

Forward Backward Top Bottom Exit

4. The output depends on how many hops exist between the server you logged into and the IP address you entered.

To interpret output similar to the following example, see [Table 4-1](#).

```
traceroute to 198.89.34.19 (198.89.34.19), 30 hops max, 40 byte packets
 1 192.168.51.250 (192.168.51.250) 2 ms 2 ms 2 ms
 2 198.89.39.250 (198.89.39.250) 3 ms 4 ms 1 ms
 3 198.89.34.19 (198.89.34.19) 5 ms * 4 ms
```

**Table 4-1** Interpreting `traceroute` Output

| Line Number | Meaning                                                                                                                                        |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 1           | Indicates the <b>IP</b> address of the interface from which the <code>traceroute</code> packets left the originating host                      |
| 2           | Indicates the <b>IP</b> address of the router that routed the <code>traceroute</code> packets                                                  |
| 3           | Indicates the <b>IP</b> address of the remote host. The * shown in this line indicates that there was packet loss connecting to this computer. |

## 4.7 Managing Automatic File Transfers

The **LSMS** generates many logs, measurements, and data files on a regular basis. These files are maintained on the **LSMS** for seven days. Customers can use the data in these files for traffic pattern analysis, identification of various network events, and investigation of problems.

The optional Automatic File Transfer feature enables customers to set up an automatic method of transferring selected files to specified remote sites at a specified frequency. Using this feature can reduce costs and also the chance of user error that could result in missed transfers of required data.

Whenever an error occurs during an automatic file transfer, an entry is made in the file `aft.log.<MMDD>` in the directory `/var/TKLC/lsmc/logs/aft` (where `<MMDD>` is the month and day when the error occurred).

Use the `autoxfercfg` command, as described in the following subsections, to set up and manage automatic file transfers. To initially set up an automatic transfer of files, perform in the order shown below, the procedures in the following sections:

1. [“Adding a New Remote Location for Automatic File Transfers”](#)
2. [“Scheduling an Automatic File Transfer”](#)

In addition, you can use the `autoxfercfg` command to perform the following functions:

- [“Displaying Remote Locations Used for Automatic File Transfers”](#)
- [“Deleting a Remote Location for Automatic File Transfers”](#)
- [“Displaying Previously Scheduled Automatic File Transfers”](#)
- [“Removing a Scheduled Automatic File Transfer”](#)

## 4.7.1 Displaying Remote Locations Used for Automatic File Transfers

To display all remote locations that have been previously added using this feature, perform the following procedure.

1. Log in to the active server as `lsmsadm`.
2. Enter the following command (for more information about the format of this command, see [“autoxfercfg”](#)):

```
$ $LSMS_DIR/autoxfercfg
```

3. The following menu is displayed:

```
Select one of the following menu options:
```

- ```
1) Display valid remote locations
2) Add new remote location
3) Remove remote location
4) Display all scheduled transfers
5) Add new scheduled transfer
6) Remove scheduled transfer
7) Exit
```

4. Enter 1.

Output similar to the following displays:

```
Valid remote machine names:
1. lnp3
2. ftp.lnp25
<hit any key to continue>
```

5. After you have pressed any key, the output displayed in step 3 is displayed again.
If you desire to perform other functions, enter a number and follow the procedure described in one of the other sections that describe this feature. For a list of the sections, see [Managing Automatic File Transfers](#).
6. If you do not need to perform any other function, type 7.

4.7.2 Adding a New Remote Location for Automatic File Transfers

To add a new remote location for files to be automatically transferred to, perform the following procedure.

1. Log in to the active server as `lsmsadm`.
2. Enter the following command (for more information about the format of this command, see [“autoxfercfg”](#)):

```
$ $LSMS_DIR/autoxfercfg
```

3. The following menu is displayed:

```
Select one of the following menu options:
```

- ```
1) Display valid remote locations
```



- 2) Add new remote location
- 3) Remove remote location
- 4) Display all scheduled transfers
- 5) Add new scheduled transfer
- 6) Remove scheduled transfer
- 7) Exit

4. Enter 2.

Output similar to the following displays:

```
Enter remote machine name:
Enter user name:
Enter password:
Verify password:
```

5. Type the desired values in all four fields, and then press **Return**.

For example, type the following values shown in **bold** and press Return. (The passwords do not display as you type them; they are shown here to demonstrate that you must enter the same value twice.)

```
Enter remote machine name: ftp.oracle.com
Enter user name: anonymous
Enter password: xy1524wp
Verify password: xy1524wp
```

The following output displays:

```
Site configured. ** Make sure the host is reachable from this system **
<hit any key to continue>
```

6. After you have pressed any key, the output displayed in step 3 is displayed again.

If you desire to perform other functions, enter a number and follow the procedure described in one of the other sections that describe this feature. For a list of the sections, [Managing Automatic File Transfers](#).

7. If you do not need to perform any other function, type 7.

## 4.7.3 Deleting a Remote Location for Automatic File Transfers

To delete a remote locations that has been previously added using this feature, perform the following procedure.

1. Log in to the active server as `lsmsadm`.
2. Enter the following command (for more information about the format of this command, see [autoxfercfg](#)):

```
$ $LSMS_DIR/autoxfercfg
```

The following menu is displayed:

Select one of the following menu options:

- 1) Display valid remote locations
- 2) Add new remote location
- 3) Remove remote location
- 4) Display all scheduled transfers
- 5) Add new scheduled transfer
- 6) Remove scheduled transfer
- 7) Exit

**3.** Enter 3.

Output similar to the following displays:

```
Enter remote machine name:
```

**4.** Type the name of the location you wish to delete and press **Return**.

For example:

```
Enter remote machine name: ftp.oracle.com
```

The following output displays:

```
Verify: remove ftp.oracle.com (y/n)?
```

**5.** Enter **y** to verify that the site shown is the remote site you wish to delete.

The following output displays:

```
Site removed.
<hit any key to continue>
```

**6.** After you have pressed any key, the output displayed in step 3 is displayed again.

If you desire to perform other functions, enter a number and follow the procedure described in one of the other sections that describe this feature. For a list of the sections, [Managing Automatic File Transfers](#).

**7.** If you do not need to perform any other function, type 7.

## 4.7.4 Displaying Previously Scheduled Automatic File Transfers

To display all automatic transfers that have been previously set up using this feature, perform the following procedure.

**Note:**

Any file transfers that have been set up to be performed one time only are not displayed.

1. Log in to the active server as `lsmsadm`.
2. Enter the following command (for more information about the format of this command, see “[autoxfercfg](#)”):

```
$ $LSMS_DIR/autoxfercfg
```

The following menu is displayed:

Select one of the following menu options:

- 1) Display valid remote locations
- 2) Add new remote location
- 3) Remove remote location
- 4) Display all scheduled transfers
- 5) Add new scheduled transfer
- 6) Remove scheduled transfer
- 7) Exit

3. Enter 4.

Output similar to the following displays:

```
Scheduled transfers:
SMTWHFS HHMM Filespec Remote
001 * 0200 /var/TKLC/lsms/logs/Midwest/Lsms
* ftp.lnp25:/tmp
002 ***** 0230 /var/TKLC/lsms/logs/survlog.log lnp3:/common/
logs
<hit any key to continue>
```

This display shows that all files with filenames that start with `Lsms` in the directory `/var/TKLC/lsms/logs/Midwest` are transferred to `ftp.lnp25:/tmp` at 2 a.m. every Monday, and that the file `survlog.log` in the `/var/TKLC/lsms/logs` directory is transferred to `lnp3:/common/logs` every night at 2:30 a.m.

4. After you have pressed any key, the output displayed in step 3 is displayed again.  
If you desire to perform other functions, enter a number and follow the procedure described in one of the other sections that describe this feature. For a list of the sections, see [Managing Automatic File Transfers](#).
5. If you do not need to perform any other function, type 7.

## 4.7.5 Scheduling an Automatic File Transfer

To set up files to be transferred automatically, perform the following procedure. It is recommended that you schedule transfers according to the following guidelines:

- Choose an off-peak time, such as very early in the morning.

- Avoid planning transfers that would result in the same file being transferred more than once. For example, because **LSMS** application logs are maintained on the **LSMS** for seven days, they only need to be scheduled for a weekly transfer. If you schedule a daily transfer for logs of that type, the same file will be transferred each day for seven days. For this reason the display described in [“Displaying Previously Scheduled Automatic File Transfers”](#) shows that the files with filenames that start with `Lsms` in the `/var/TKLC/lsms/logs/Midwest` directory are transferred only on Mondays.

Transferring large numbers of files does not impact the processing performance of the **LSMS**, but it can impact network performance, especially networks that use the single-subnet design. (For more information about network design, refer to the ***LSMS Configuration Manual***.) This feature is designed for insignificant network degradation for up to 10 configured remote locations with up to 600 transferred files.

1. Log in to the active server as `lsmsadm`.
2. Enter the following command (for more information about the format of this command, see [“autoxfercfg”](#)):

```
$LSMS_DIR/autoxfercfg
```

The following menu is displayed:

Select one of the following menu options:

- 1) Display valid remote locations
- 2) Add new remote location
- 3) Remove remote location
- 4) Display all scheduled transfers
- 5) Add new scheduled transfer
- 6) Remove scheduled transfer
- 7) Exit

3. Enter 5.

Output similar to the following displays:

```
Enter filespec:
Enter remote machine name:
Enter remote directory:
Enter FTP port [21]:
Enter transfer time (HHMM):
Run (O)nce, (D)aily, (W)eekly:
Enter day of the week: (SU,MO,TU,WE,TH,FR,SA):
```

4. Type the desired values in all four fields, and then press Return.

For the time, use the twenty-four hour notation, where 11 p.m is represented as 2300. To specify multiple files, you can use a wildcard character (\*) in file names. For example, to set up a weekly transfer of the file `haEvents.err` in the `/var/TKLC/lsms/logs` directory every Tuesday morning at 1:30 a.m, type the following values, as shown in **bold**, and press Return:

```
Enter filespec: /var/TKLC/lsms/logs/haEvents.err
Enter remote machine name: lnp3
Enter remote directory: /common/logs
Enter FTP port [21]: 80
```

```
Enter transfer time (HHMM): 0130
Run (O)nce, (D)aily, (W)eekly: W
Enter day of the week: (SU,MO,TU,WE,TH,FR,SA): TU
```

Output similar to the following displays to verify your input. If the display agrees with your input, type **y**, as shown in **bold**, and press Return:

```
SMTWHFS HHMM Filespec Remote
* 0230 /var/TKLC/lsmc/logs/haEvents.err lnp3:/common/logs
Is this correct (y/n)? y
```

The following output displays:

```
Automatic transfer successfully scheduled.
<hit any key to continue>
```

5. After you have pressed any key, the output displayed in step 3 is displayed again.  
If you desire to perform other functions, enter a number and follow the procedure described in one of the other sections that describe this feature. For a list of the sections, [Managing Automatic File Transfers](#).
6. If you do not need to perform any other function, type 7.

## 4.7.6 Removing a Scheduled Automatic File Transfer

To remove an automatic transfer that has been previously set up using this feature, perform the following procedure.



### Note:

Any file transfers that have been set up to be performed one time only cannot be removed.

1. Log in to the active server as `lsmcadmin`.
2. Enter the following command (for more information about the format of this command, see ["autoxfercfg"](#)):

```
$LSMS_DIR/autoxfercfg
```

The following menu is displayed:

Select one of the following menu options:

- 1) Display valid remote locations
- 2) Add new remote location
- 3) Remove remote location
- 4) Display all scheduled transfers
- 5) Add new scheduled transfer
- 6) Remove scheduled transfer
- 7) Exit

3. Enter 6.

Output similar to the following displays to show all currently scheduled transfers. Enter the number of the transfer that you want to remove (in this example, the first transfer is to be removed, as shown by 1, in **bold**), or enter 0 to quit:

```
Scheduled transfers:
SMTWHFS HHMM Filespec Remote
001 * 0200 /var/TKLC/lsms
/
logs/Midwest/Lsms* ftp.lnp25:/tmp
002 ***** 0230 /var/TKLC/lsms/logs/survlog.log lnp3:/common/logs
Remove transfer # (0-3, 0=quit): 1
```

4. The following output displays.

```
Scheduled transfer successfully removed.
<hit any key to continue>
```

5. After you have pressed any key, the output displayed in step 3 is displayed again.

If you desire to perform other functions, enter a number and follow the procedure described in one of the other sections that describe this feature. For a list of the sections, [Managing Automatic File Transfers](#).

6. If you do not need to perform any other function, type 7.

# 5

## Restarting Software Processes

This chapter describes how the **LSMS** automatically attempts to restart certain types of failures. It also describes how to manually verify and restart **LSMS** software components.

### 5.1 Introduction

This chapter describes how the **LSMS** automatically attempts to restart certain types of failures. It also describes how to manually verify and restart **LSMS** software components.

### 5.2 Automatically Restarting Software Processes

The **LSMS** Automatic Software Recovery feature, available as a standard feature for **LSMS** Release 2.0 and later, detects failures in certain **LSMS** processes and attempts to restart the processes without the need for manual intervention by the customer. This feature is implemented by the `sentryd` utility.

#### Detecting Failure Conditions

[Table 5-1](#) shows which processes are checked by `sentryd` and the error conditions for which they are checked.

**Table 5-1 Processes Monitored by the Automatic Software Recovery Feature**

| Process                     | Unintentional Exit | Inability to Perform Defined Tasks | Failed to Initialize During Startup | See section:                                                                          |
|-----------------------------|--------------------|------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------|
| EAGLE agents                | X                  | X                                  | X                                   | <a href="#">Automatically Monitoring and Restarting EAGLE Agent Processes</a>         |
| Regional <b>NPAC</b> agents | X                  | X                                  | X                                   | <a href="#">Automatically Monitoring and Restarting NPAC Agent Processes</a>          |
| <b>OSI</b>                  | X                  |                                    |                                     | <a href="#">Automatically Monitoring and Restarting OSI Process</a>                   |
| Service Assurance           | X                  |                                    |                                     | <a href="#">Automatically Monitoring and Restarting the Service Assurance Process</a> |
| Local Services Manager      | X                  | X                                  | X                                   | <a href="#">Automatically Monitoring and Restarting Other Processes</a>               |

**Table 5-1 (Cont.) Processes Monitored by the Automatic Software Recovery Feature**

| Process            | Unintentional Exit | Inability to Perform Defined Tasks | Failed to Initialize During Startup | See section:                                                                   |
|--------------------|--------------------|------------------------------------|-------------------------------------|--------------------------------------------------------------------------------|
| Local Data Manager | X                  | X                                  | X                                   | <a href="#">Automatically Monitoring and Restarting Other Processes</a>        |
| Logger Server      | X                  |                                    | X                                   | <a href="#">Automatically Monitoring and Restarting Other Processes</a>        |
| LSMS SNMP Agent    | X                  |                                    | X                                   | <a href="#">Automatically Monitoring and Restarting Other Processes</a>        |
| Apache web server  | X                  |                                    | X                                   | <a href="#">Automatically Monitoring and Restarting Other Processes</a>        |
| RMTP Manager       | X                  |                                    | X                                   | <a href="#">Automatically Monitoring and Restarting the rmtpmgr Process</a>    |
| RMTP Agent         | X                  |                                    | X                                   | <a href="#">Automatically Monitoring and Restarting the rmtpageant Process</a> |
| Report Manager     | X                  |                                    | X                                   | <a href="#">Automatically Monitoring and Restarting Other Processes</a>        |

The `sentryd` process uses either of the following methods to detect failures:

- Verifying that the process has updated its timestamp in the supplemental database periodically
- Using standard Linux commands to determine whether a process is running

For more information about specific methods used to detect failures, see the section shown in the last column of [Table 5-1](#).

### Reporting Failures Through the Surveillance Feature

If the Surveillance feature is not enabled, `sentryd` still detects failures and attempts to restart processes, but important information concerning the state of the **LSMS** is neither displayed nor logged.

To obtain the full benefit of this feature, the Surveillance feature must be enabled. The Surveillance feature displays and logs (in `/var/TKLC/lsmss/logs/survlog.log`) the following notifications regarding the following conditions:

- Software failures
- Successful recovery of the software
- Unsuccessful recovery of the software

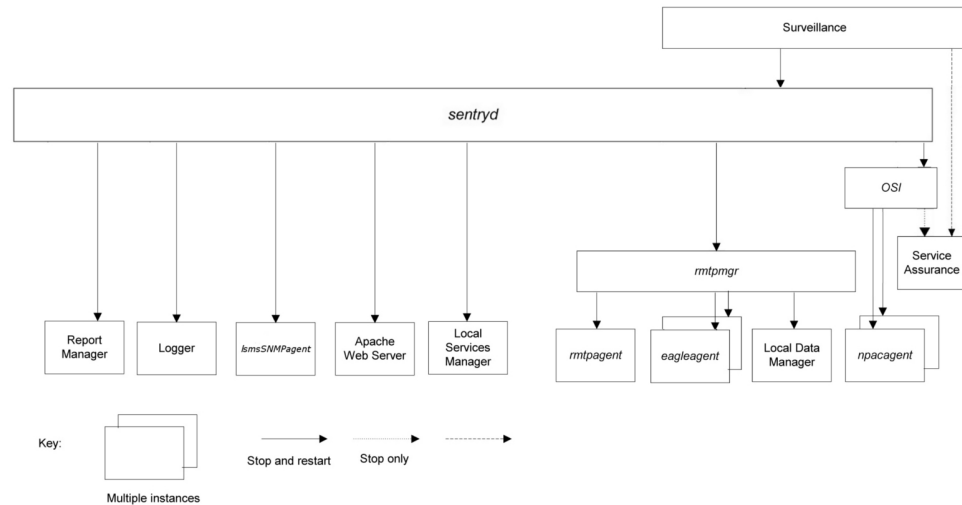


Also, whether or not the Surveillance feature is enabled, surveillance agents will restart the `sentryd` process if it exits abnormally.

### Automatically Restarting Processes Hierarchically

Figure 5-1 shows how `sentryd` restarts processes in a hierarchical order.

**Figure 5-1 Order of Automatically Restarting Processes**



This figure illustrates:

- Which processes `sentryd` monitors.
- When a failure is detected in a process, `sentryd` attempts to restart the failed process and all processes shown below it.
- The optional Service Assurance process is monitored for failure, but is not restarted by `sentryd`. Also, if `sentryd` restarts the **OSI** process, it stops the Service Assurance process. (The Surveillance feature restarts the Service Assurance process whenever it detects that the Service Assurance process has stopped.)

All recovery procedures start within 60 seconds of failure detection.

## 5.2.1 Automatically Monitoring and Restarting EAGLE Agent Processes

The following sections describe the failure conditions for which `sentryd` monitors the EAGLE agent processes (`eagleagent`) and the steps performed in attempts to restart the process after failure has been detected.

### Monitoring EAGLE Agent Processes

The `sentryd` process monitors each EAGLE agent process for the following conditions:

- Failure to initialize during automatic system startup
- Failure to initialize during manual startup using the `eagle` command

- An abnormal exit during normal operation
- Inability to perform its defined tasks, for example, because it is in an infinite loop

### Restarting an EAGLE Agent Process

When one of conditions described in “[Monitoring Eagle Agent Processes](#)” has been detected, `sentryd` performs the following tasks:

1. Generates the following surveillance notification, which represents the Common Language Location Identified (CLLI) of the **EAGLE**:

```
LSMS6004|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - FAILD: eagleagent
<CLLI>
```

2. Attempts to stop and restart the `eagleagent`. If the `eagleagent` restarts, `sentryd` generates the following Surveillance notification:

```
LSMS6005|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - RECOV: eagleagent
<CLLI>
```

### Continuing Attempts to Restart an EAGLE Agent Process

If the attempt to restart the `eagleagent` fails, `sentryd` attempts again.

If this attempt is also unsuccessful, the `sentryd` process generates the following Surveillance notification and continues to attempt to restart the `eagleagent` process.

```
LSMS6006|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - RFAILD: eagleagent
<CLLI>
```

If this notification appears several times in a row, contact My Oracle Support.

## 5.2.2 Automatically Monitoring and Restarting NPAC Agent Processes

The following sections describe the failure conditions for which `sentryd` monitors the regional **NPAC** agent processes (`npacagents`) and the steps performed in attempts to restart an `npacagent` process after failure has been detected.

### Monitoring NPAC Agent Processes

For each region, `sentryd` monitors its `npacagent` process for the following conditions:

- Failure to initialize during automatic system startup
- Failure to initialize during manual startup using the `lsms` command
- An unintentional exit or crash during normal operation
- Inability to perform its defined tasks, for example, because it is in an infinite loop

### Restarting NPAC Agent Processes

When one of conditions described in “[Monitoring NPAC Agent Processes](#)” has been detected, `sentryd` performs the following tasks:

1. Generates the following surveillance notification:

```
LSMS6008|08:40 Sep 11, 1998|xxxxxxx| Notify:Sys Admin - FAILED:
<NPAC_region> agent
```

where `<NPAC_region>` indicates the name of the region whose `npacagent` process has failed.

2. Attempts to stop and restart the failed `npacagent`. If the `npacagent` restarts, `sentryd` generates the following Surveillance notification:

```
LSMS6009|08:40 Sep 11, 1998|xxxxxxx| Notify:Sys Admin - RECOV:
<NPAC_region> agent
```

### Continuing Attempts to Restart NPAC Agent Processes

If the attempt to restart the `npacagent` fails, `sentryd` attempts again. If this attempt is also unsuccessful, the `sentryd` process generates the following Surveillance notification and continues to attempt to restart the `npacagent` process.

```
LSMS6010|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - RFAILED:
<region> agent
```

If this notification appears several times in a row, contact My Oracle Support.

## 5.2.3 Automatically Monitoring and Restarting OSI Process

The following sections describe the failure conditions for which `sentryd` monitors the **OSI** process and the steps performed in attempts to restart the processes after failure has been detected.

### Monitoring the OSI Process

The `sentryd` process monitors the **OSI** process for the following conditions:

- An unintentional exit or crash during normal operation

### Restarting the OSI Process

When one of conditions described in [“Monitoring the OSI Process”](#) has been detected, `sentryd` performs the following tasks:

1. Generates the following surveillance notification:

```
LSMS8037|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - FAILD: OSI
```

2. Stops all running `npacagent` processes and the Service Assurance process, if it is running.
3. Attempts to restart the **OSI** process and all `lsmsagent` processes that were previously running. If all processes restart, `sentryd` generates the following Surveillance

notifications, where **<NPAC\_region>** is the name of the region served by the `npacagent` process and **<CLLI>** is the name of the **EAGLE** agent:

```
LSMS8038|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - RECOV: OSI
LSMS6005|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - RECOV:
eagleagent <CLLI>
LSMS6009|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - RECOV:
<NPAC_region> agent
```

### Continuing Attempts to Restart the OSI Process

If the attempt to restart the **OSI** process fails, `sentryd` attempts again. After two failed attempts, `sentryd` generates the following Surveillance notification.

```
LSMS8039|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - RFAILED: OSI
```

If this notification appears, contact My Oracle Support.

## 5.2.4 Automatically Monitoring and Restarting the Service Assurance Process

The following sections describe the failure conditions for which `sentryd` monitors the optional Service Assurance process (`sacw`) and states that the Surveillance feature restarts `sacw` when it fails.

### Monitoring the Service Assurance Process

The `sentryd` process monitors the optional Service Assurance process (`sacw`) so that it can be stopped if the **OSI** process need to be restarted. It is monitored for the following conditions:

- An unintentional exit or crash during normal operation
- Inability to perform its defined tasks, for example, because it is in an infinite loop

### Restarting the Service Assurance Process

The `sentryd` does not attempt to restart the Service Assurance process when it fails. The Surveillance feature performs that function. For more information about the Service Assurance process, see [“Understanding the Service Assurance Feature”](#).

## 5.2.5 Automatically Monitoring and Restarting the `rmtpmgr` Process

The following sections describe the failure conditions for which `sentryd` monitors the **RMTP** Manager process (`rmtpmgr`) and the steps performed in attempts to restart `rmtpmgr` after failure has been detected.

### Monitoring the `rmtpmgr` Process

The `sentryd` process monitors `rmtpmgr` for the following conditions:

- Failure to initialize during automatic system startup
- An unintentional exit or crash during normal operation

- Inability to perform its defined tasks, for example, because it is in an infinite loop

### Restarting the `rmtpmgr` Process

When one of conditions described in “[Monitoring the `rmtpmgr` Process](#)” has been detected, `sentryd` performs the following tasks:

1. Generates the following surveillance notification:

```
LSMS4021|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - rmtpmgr
failed
```

2. Attempts to stop and restart the process. If the process restarts, no notification is posted. After the `sentryd` process has restarted the `rmtpmgr` process, `sentryd` then attempts to restart the following processes that exited previously due to the `rmtpmgr` failure:
  - **NPAC** agents (see [Restarting NPAC Agent Processes](#))
  - **EAGLE** agents (see [Restarting an EAGLE Agent Process](#))
  - **Local Data Manager** (see [Restarting Other Processes](#))

### Continuing Attempts to Restart the `rmtpmgr` Process

If the attempt to restart the `rmtpmgr` process fails, `sentryd` attempts again. If the attempt fails again, `sentryd` generates the **LSMS4021** notification again. If this notification appears several times in a row, contact My Oracle Support.

## 5.2.6 Automatically Monitoring and Restarting the `rmtpagent` Process

The following sections describe the failure conditions for which `sentryd` monitors the **RMTP** Agent process (`rmtpagent`) and the steps performed in attempts to restart `rmtpagent` after failure has been detected.

### Monitoring the `rmtpagent` Process

The `sentryd` process monitors `rmtpagent` for the following conditions:

- Failure to initialize during automatic system startup
- An unintentional exit or crash during normal operation
- Inability to perform its defined tasks, for example, because it is in an infinite loop

### Restarting the `rmtpagent` Process

When one of conditions described in [Monitoring the `rmtpagent` Process](#) has been detected, `sentryd` performs the following tasks:

1. Generates the following surveillance notification:

```
LSMS4021|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - rmtpagent failed
```

2. Attempts to stop and restart the process. If the process restarts, no notification is posted. After the `sentryd` process has restarted the `rmtpagent` process, `sentryd` then attempts to restart the following processes that exited previously due to the `rmtpagent` failure:

- **NPAC** agents (see [Restarting NPAC Agent Processes](#))
- **EAGLE** agents (see [Restarting an EAGLE Agent Process](#))
- **Local Data Manager** (see [Restarting Other Processes](#))

### Continuing Attempts to Restart the `rmtpagent` Process

If the attempt to restart the `rmtpagent` process fails, `sentryd` attempts again. If the attempt fails again, `sentryd` generates the `LSMS4021` notification again. If this notification appears several times in a row, contact My Oracle Support.

## 5.2.7 Automatically Monitoring and Restarting Other Processes

The following sections describe the failure conditions for which `sentryd` monitors the following processes and the steps performed in attempts to restart a process after failure has been detected:

- **Local Services Manager** (`lsman`)
- **LSMS SNMP Agent** (`lsmsSNMPagent`)
- **Local Data Manager** (`supman`)
- **Report Manager** (`reportman`)
- **Logger Server**
- **Apache Web Server**

### Monitoring Other Processes

The `sentryd` process monitors each process for the following conditions:

- Failure to initialize during automatic system startup
- An unintentional exit or crash during normal operation
- Inability to perform its defined tasks, for example, because it is in an infinite loop

### Restarting Other Processes

When one of conditions described in [Monitoring EAGLE Agent Processes](#) has been detected, `sentryd` performs the following tasks:

1. Generates the following surveillance notification, where `<process_name>` is the name of the process:

```
LSMS4021|08:40 Sep 11, 1998|xxxxxxx|Notify:Sys Admin - <process_name>
failed
```

2. Attempts to stop and restart the process. If the process restarts, no notification is posted.

### Continuing Attempts to Restart Other Processes

If the attempt to restart the process fails, `sentryd` attempts again. If the attempt fails again, `sentryd` generates the `LSMS4021` notification again. If this notification appears several times in a row, contact My Oracle Support.

# 6

## Managing Server States

This chapter describes the various states that servers can have, the automatic switchover capability for certain failures, and how you can manage the states of the servers manually.

### 6.1 Introduction

This chapter describes the various states that servers can have, the automatic switchover capability for certain failures, and how you can manage the states of the servers manually.

### 6.2 Understanding Server States

The **LSMS** has two servers for high availability. Usually, the **LSMS** is in *duplex* mode, with one server the active server and the other server in a standby state. In duplex mode, the active server is the master MySQL database server, and the standby server acts as the MySQL slave. Any database changes are made on the active server and are replicated to the standby server.

If the active server is not able to run **LSMS** functions, the standby server can take over to be the active server. The servers are peers; either server can be the active server, but only one server can be active at a time.

When one server is in **ACTIVE** state and the other server is not in **STANDBY** state, the **LSMS** is in *simplex* mode. When the **LSMS** is in simplex mode, the non-**ACTIVE** server should be brought back to **STANDBY** state as soon as possible (use the procedure described in [“Starting a Server”](#)).

The state of each server is monitored by the **LSMS** High Availability (**HA**) utility. [Table 6-1](#) shows the possible states for each server (but only one server at a time can be in the **ACTIVE** state).

**Table 6-1 LSMS Server States**

| State                            | Server Status                                                                                                                                                                                                                                        |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ACTIVE</b>                    | Server is online, running the <b>LSMS</b> application, and acts as the MySQL master.                                                                                                                                                                 |
| <b>STANDBY</b>                   | Server is online and participating in database replication. The server ready to become the active server if automatic switchover is necessary or if manual switchover is performed. The server is not currently running the <b>LSMS</b> application. |
| <b>UNINITIALIZED "INHIBITED"</b> | Server is online but it is not participating in database replication and no application is running.                                                                                                                                                  |

Table 6-1 (Cont.) LSMS Server States

| State                                                                                                                                                                                                        | Server Status |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|  <b>Note:</b><br>Other transitional states may be displayed while a server is changing from one to another of these states. |               |

## 6.3 Understanding Switchover

Changing active status from one server to another is called *switchover*. The server on which the **LSMS** is running at a given time is called the *active* server. If the other server is in **STANDBY** state, it is called the *standby* server. (If the other server is in **UNINITIALIZED** "INHIBITED" state, the **LSMS** is said to be running in simplex mode, which means that only one server is currently available to run the **LSMS** application, and switchover is not possible.) During switchover, the server that was in **ACTIVE** state changes to **UNINITIALIZED** "INHIBITED" state and the server that was in **STANDBY** state changes to **ACTIVE** state.

### What Happens During Switchover?

During a switchover, the following functions occur:

1. The active server shuts down the **LSMS** application and transitions to **UNINITIALIZED** "INHIBITED" state.
2. The standby server stops replicating the MySQL database.
3. The standby server starts the **LSMS** application.

#### Note:

After switchover the state of the previously active server is **UNINITIALIZED** "INHIBITED", so this server is not ready to act as a standby server. As soon as possible, perform the procedure described in "Starting a Server" to put this server in **STANDBY** state.

The following items describe the results of a switchover:

- Any server-side **GUIs** (started using the `start_mgui` command) are terminated. This type of **GUI** must be restarted manually.
- All **NPAC** associations are terminated and then automatically restarted to connect to the newly active server (for more information, see [LSMS Connectivity](#))
- All **EMS** associations are terminated and then automatically restarted to connect to the newly active server (for more information, see [LSMS Connectivity](#))
- The Virtual **IP (VIP)** address is switched from the previously active server to the newly active server. In all types of network configuration, the **VIP** address is used for the application network, which is used by the following functions:



- The Service Assurance feature is restarted by the Surveillance feature after the newly active server takes over.
- After directly-connected Query Servers detect a period of inactivity, they attempt to reconnect. The reconnection is made to the newly active server.
- Web-based **GUIs** (if this feature is enabled).

 **Note:**

Although it is possible to start a web-based **GUI** by specifying the server's specific **IP** address, it is recommended that web-based **GUIs** use the **VIP** address. Any web-based **GUIs** that do not use the **VIP** address will terminate during switchover.

Switchover has the following effects on connections on the web-based **GUIs** that use the **VIP** address:

- \* An alarm that switchover is being initiated is displayed
- \* Any user-initiated actions, such as audits or bulk loads, are terminated
- \* All web-based **GUI** sessions automatically reconnect themselves to the newly active server within the **GUI** refresh interval
- \* Until the **GUI** reconnects, no new **GUI** notifications will be displayed

For some types of failure on the active server, the **LSMS** automatically attempts to switch over. If automatic switchover is not possible, or at any time you wish, you can manually switch over to the other server. For more information about switching over, see the following:

- [Understanding Automatic Switchover](#)
- [Manually Switching Over from the Active Server to the Standby Server](#)

### What Needs to Happen When Switchover Completes?

When automatic or manual switchover completes, the **LSMS** is operating in simplex mode, with one server in **ACTIVE** state and the other server in **UNINITIALIZED "INHIBITED"** state. Only the server in **ACTIVE** state is in a condition that is available for running the **LSMS** application.

As soon as possible, manual intervention is needed to change the state of the non-active server to **STANDBY** state by performing the procedure described in [Starting a Server](#). When this procedure is performed on a non-active server (while the other server is in **ACTIVE** state), the following functions are performed:

1. The MySQL binary logs of the active server are copied to the server being started.
2. The server being started takes the MySQL slave role and begins database replication.
3. The server changes to **STANDBY** state; it is now available if switchover is needed again.

## 6.4 Understanding Automatic Switchover

The **LSMS** is designed with a number of redundant systems (such as power feeds and **CPUs**) to enable a server to continue hosting the **LSMS** application even after some failures. For cases of double-faults or other failure conditions for which there is no designed redundancy, the **LSMS** is designed to automatically switch over from the active server to the standby server. These failure conditions fall into the following categories:

- Hardware-related failures, such as loss of both power feeds, loss of redundant power feeds, loss of memory controller, and so on
- **Database**-related failures, such as failed mysqld process
- Network-related failures, if the user has defined certain network interfaces to be critical

#### Automatic Switchover Due to Hardware-Related Failure

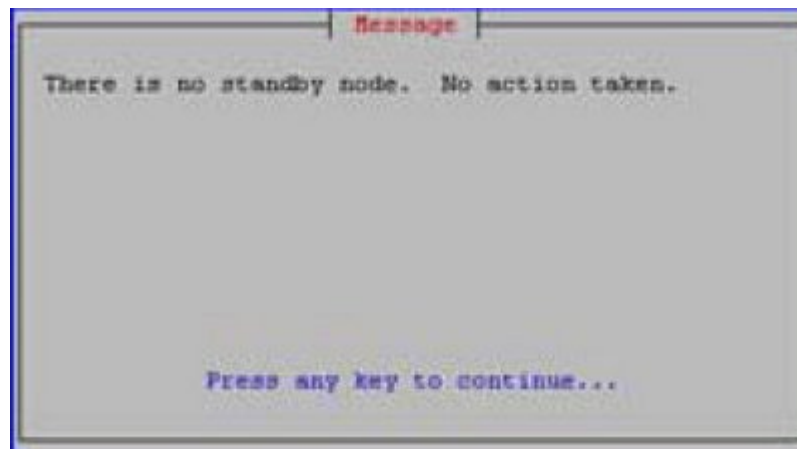
The **LSMS HA** daemons on the active and standby servers send each other heartbeats once every second. When a server detects a loss of 10 heartbeats in a row, the server concludes that the other server is no longer functional and does the following:

- If the active server detects the loss of 10 heartbeats in a row from the standby server, the active server disqualifies the standby server from either automatic or manual switchover and posts the following notification:

```
LSMS4015|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Heartbeat failure
```

Until the standby server returns to **STANDBY** state, automatic switchover is not possible, and if manual switchover is attempted, the `lsmsmgr` text interface displays a warning indicating that there is no standby mode and no action is taken.

**Figure 6-1 Unable to Switchover to Standby**



- If the standby server detects the loss of 10 heartbeats in a row from the other server, the standby server transitions to **ACTIVE** state. The results are the same as those described in [What Happens During Switchover?](#).

```
LSMS4015|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Heartbeat failure
```

#### Automatic Switchover Due to Database-Related Failure

Each server monitors itself for accessibility to its database. In addition, the standby server monitors whether the replication process running and whether its replication of the active server's database is within a configured threshold (the default is one day).

- If a server finds an error in any of these conditions, it posts the following notification:

```
LSMS4007|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - DB repl error
```

In addition, the server does the following:

- If the active server detects that its database is inaccessible, the active server switches over to the standby server and posts the following notifications:

```
LSMS4000|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Switchover
initiated
```

If switchover is successful, the following notification is posted:

```
LSMS4001|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Switchover
complete
```

If switchover is not successful, the following notification is posted:

```
LSMS4002|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Switchover failed
```

- If the standby server detects that its replication process is not running, its database is inaccessible, or its database is lagging by more than the configured threshold, the standby server transitions to **UNINITIALIZED "INHIBITED"** state, and posts one of the following notifications, depending on whether the standby server is Server A (the server with the default server name `lsmspri`) or Server B (the server with the default server name `lsmsssec`):

```
LSMS4013|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Primary inhibited
```

```
LSMS4014|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Secondary
inhibited
```

### Automatic Switchover Due to Network-Related Failure

Users have the option of defining any network interfaces (**NPAC**, **EMS**, and/or Application) as critical. For each network interface that the user defines as critical, the user defines one or more **IP** addresses to be pinged by each server every minute. (For information about how to define a network interface as critical, refer to the *Configuration Guide*.)

When a network interface is defined as critical, each server pings the first configured **IP** address every minute. If the ping fails and only one **IP** address has been defined for that network interface, the interface is considered to have failed. If the interface has additional **IP** addresses defined, the interface is not considered to have failed until all **IP** addresses have been pinged with no response.

When a network interface is considered to have failed, the server posts one of the following notifications that corresponds to the failed interface:

```
LSMS2000|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - NPAC interface failure
```

```
LSMS0001|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - EMS interface failure
```

```
LSMS4004|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - APP interface failure
```

After the server posts the notification of interface failure, it does the following:

- If the active server detects that a critical network interface has failed, the active server determines whether any critical network interfaces are considered to have failed on the standby server:
  - If any critical network interfaces are considered to have failed on the standby server, the active server continues in the **ACTIVE** state; it does not switch over.
  - If all critical network interfaces are responding to pings on the standby server, the active server switches over to the standby server and posts the following notifications:

```
LSMS4000|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Switchover
initiated
```

If switchover is successful, the following notification is posted:

```
LSMS4001|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Switchover
complete
```

If switchover is not successful, the following notification is posted:

```
LSMS4002|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Switchover failed
```

- If the standby server detects that a critical network interface has failed, it continues to operate in **STANDBY** state. Although automatic switchover is not performed in this case, it is possible to manually switch over to a standby server that has detected a critical network interface has failed.

## 6.5 Managing Server States Manually

The following sections describe how you can manually manage the server states:

- [“Determining the Server Status”](#)
- [“Manually Switching Over from the Active Server to the Standby Server”](#)
- [“Inhibiting a Standby Server”](#)

- [“Starting a Server”](#)

### Determining the Server Status

Use either of the following to determine the server status:

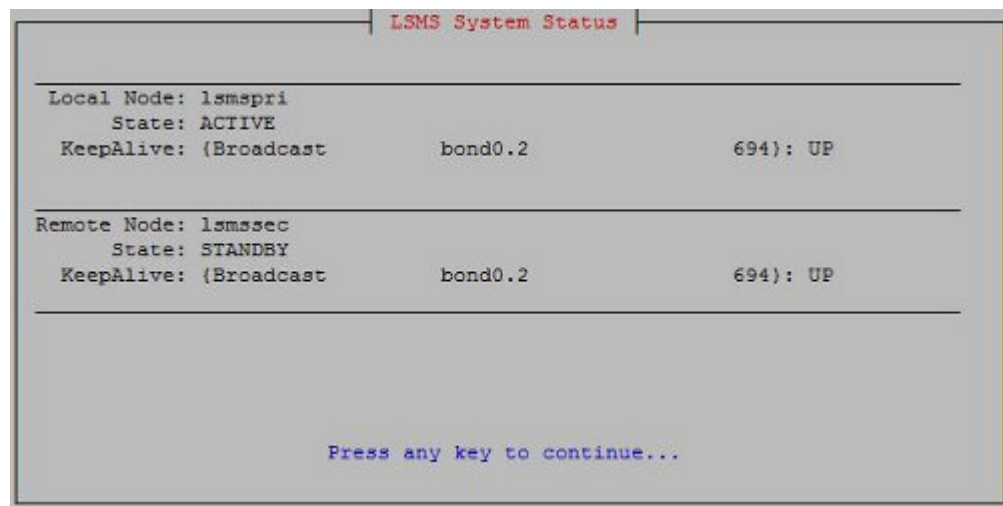
- [“Using the `lsmsmgr` Interface to Determine the Server Status”](#)
- [“Using the `hastatus` Command to Determine the Server Status”](#)

## 6.5.1 Using the `lsmsmgr` Interface to Determine the Server Status

Use the following procedure to determine the status of both servers.

1. Log into either server as the `lsmsmgr` user.
2. From the main `lsmsmgr` interface, select **Maintenance**, and then **LSMS Node Status**.

Figure 6-2 LSMS Node Status



```
LSMS System Status

Local Node: lsmspri
State: ACTIVE
KeepAlive: {Broadcast bond0.2 694}: UP

Remote Node: lmssec
State: STANDBY
KeepAlive: {Broadcast bond0.2 694}: UP

Press any key to continue...
```

In [Figure 6-2](#), the server that was logged into is named `lsmspri` and its state is **ACTIVE**; the mate server is named `lmssec` and its state is **STANDBY**.

3. Press any key to return to the `lsmsmgr` Maintenance menu.

## 6.5.2 Using the `hastatus` Command to Determine the Server Status

To use the command line to determine the state an individual server, perform the following procedure.

1. Log in as the `lmsadm` or `lmsall` user to the command line of the server whose state you want to determine.  
(For information about logging in, see [“Logging In to LSMS Server Command Line”](#).)
2. Enter the following command:  

```
$ hastatus
```
3. The command line interface displays the status, similar to the following example, and then returns the prompt.

```
ACTIVE
$
```

### 6.5.3 Manually Switching Over from the Active Server to the Standby Server

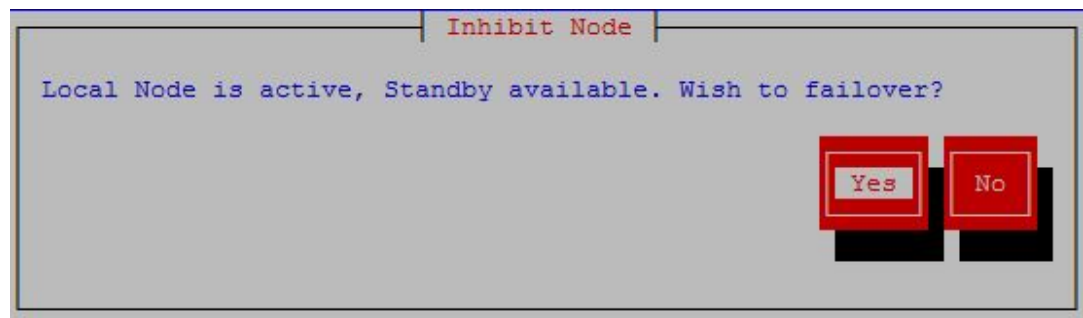
When there is a failure on the active server, or at other times for testing, you can use the `lsmsmgr` interface to manually switch over to the standby server, as described in the following procedure.

1. Log in as the `lsmsmgr` user to the active server.  
(For information about logging in as `lsmsmgr`, see [“Logging In to LSMS Server Command Line”](#).)

2. From the main `lsmsmgr` interface, select **Maintenance**, and then **Inhibit Node**.

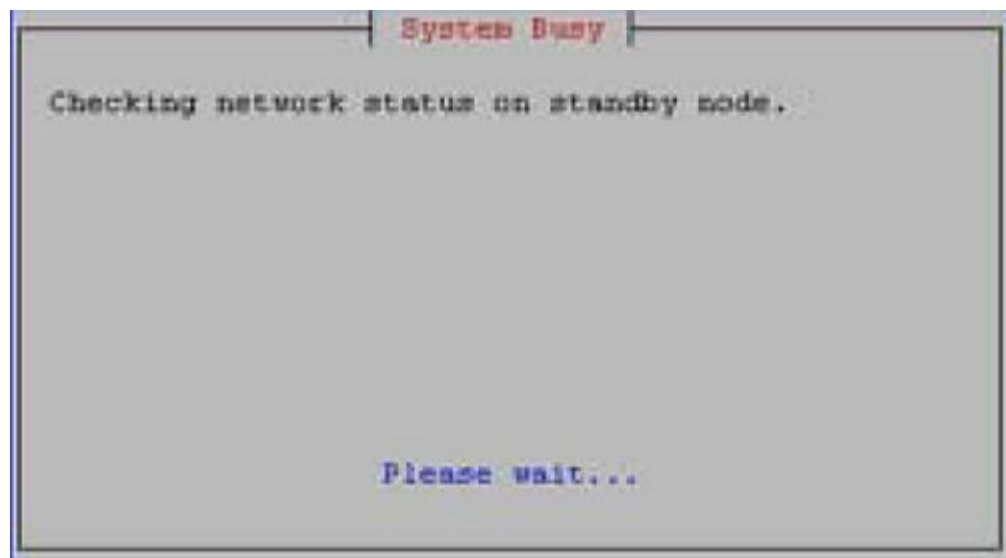
If the server you logged into is the **ACTIVE** server, the `lsmsmgr` interface displays information that confirms that the local node (the server you logged into) is active and the mate server is available as a standby (which implies that its state is **STANDBY**).

**Figure 6-3 Inhibit Active Node**



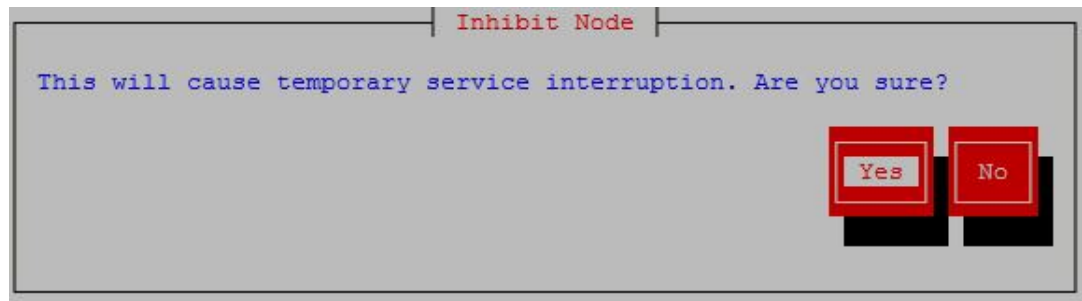
3. Ensure that the **Yes** button is highlighted and press **Enter**.  
A window, as shown in [Figure 6-4](#), displays, but no action is needed.

**Figure 6-4 Check Network Status on Standby Node**



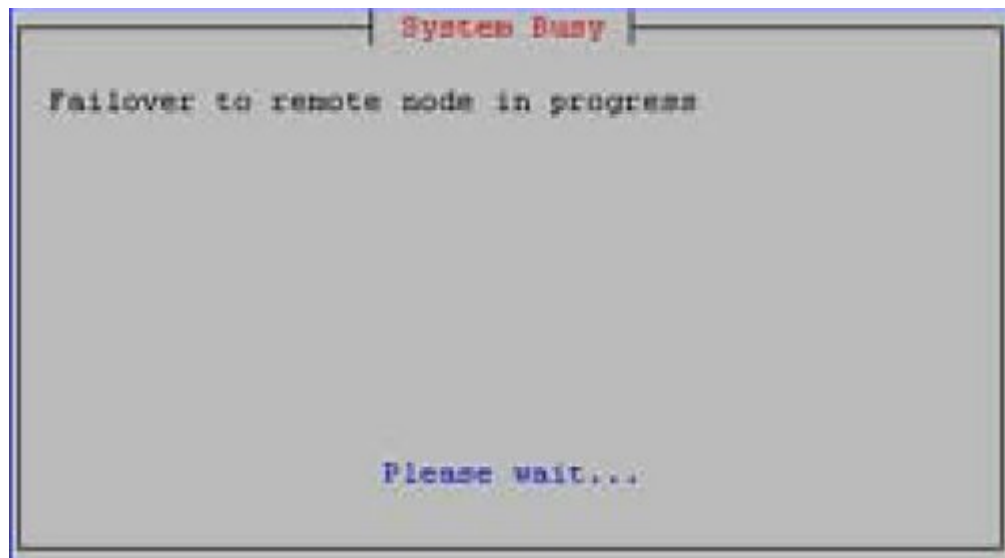
4. After the network status on the standby node is checked, a confirmation window displays.

**Figure 6-5 Confirm Switchover**



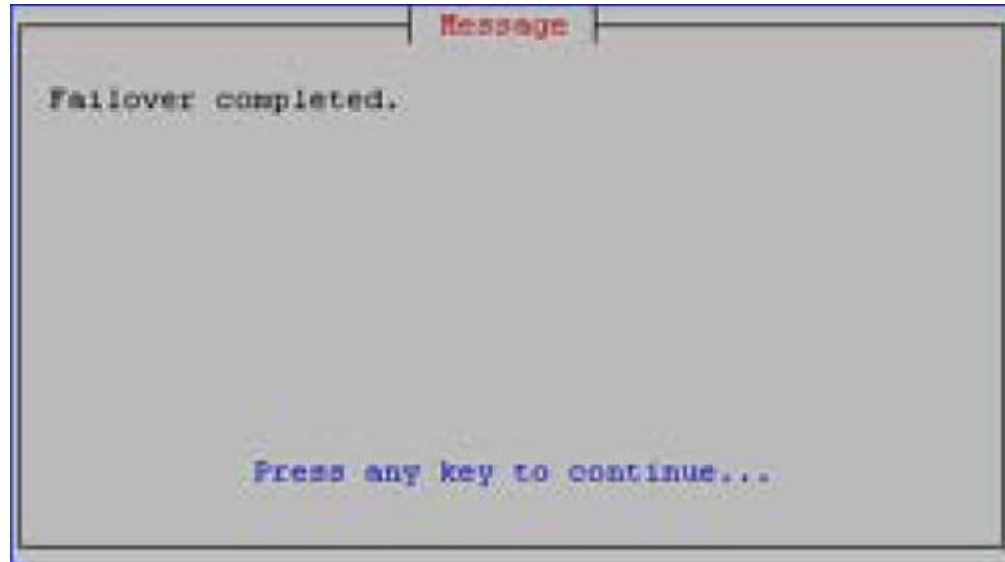
5. Ensure that the **Yes** button is highlighted and press **Enter**.  
The window shown in [Figure 6-7](#) displays.

**Figure 6-6 Manual Switchover In Progress**



6. When the switchover is complete, press any key to continue.

Figure 6-7 Manual Switchover Complete



The server that was previously in **STANDBY** state is now in **ACTIVE** state, and the server that was previously in **ACTIVE** state is now in **UNINITIALIZED "INHIBITED"** state.



**Note:**

As soon as possible, perform the procedure described in [“Starting a Server”](#) to change the state of the server that is in **UNINITIALIZED "INHIBITED"** state to **STANDBY** state so that it is available if automatic switchover is needed or if manual switchover is desired.

## 6.5.4 Inhibiting a Standby Server

Occasionally (for example, before powering down), it may be necessary to inhibit the standby server.



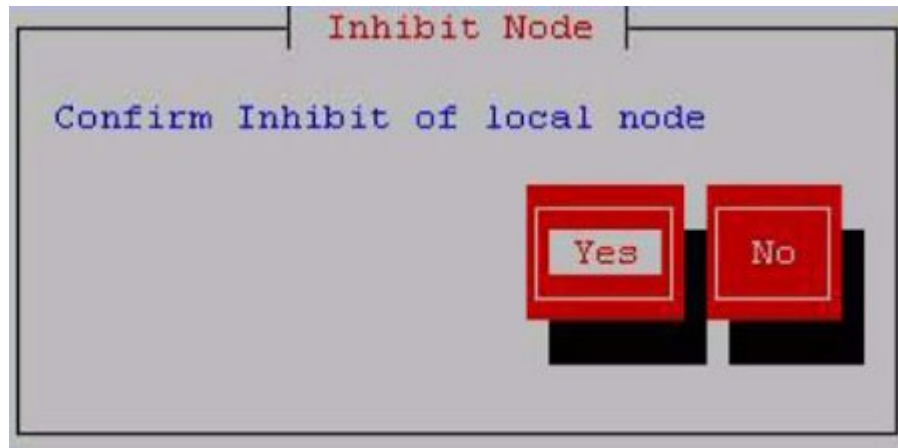
**Note:**

Inhibiting the active server results in switchover, as described in [“Manually Switching Over from the Active Server to the Standby Server”](#).

Use the following procedure to inhibit the standby server.

1. Log in as the `lsmsmgr` user to the standby server.  
(For information about logging in as `lsmsmgr`, see [“Logging In to LSMS Server Command Line”](#).)
2. From the main `lsmsmgr` interface, select **Maintenance**, and then **Inhibit Node**.  
The `lsmsmgr` interface displays the window shown in [Figure 6-8](#).



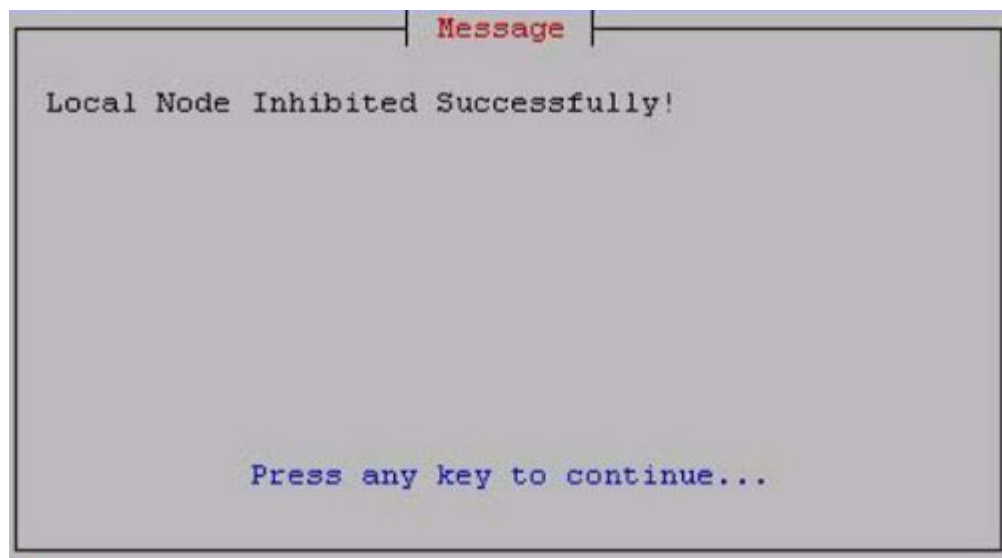
**Figure 6-8 Inhibit a Non-Active Server**

3. Ensure that the **Yes** button is highlighted and press **Enter**.

While the server is being inhibited, the `lsmsmgr` interface disappears and the following text is displayed on the command line, where `<hostname>` is the name of the server:

```
Inhibiting node <hostname>...
```

4. When the server has been completely inhibited, the `lsmsmgr` interface appears again. Press any key to continue.

**Figure 6-9 Node Successfully Inhibited**

The `lsmsmgr` main menu is displayed again.

**Note:**

Do not allow this server to remain in **UNINITIALIZED "INHIBITED"** state any longer than necessary. As soon as possible, perform the procedure described in perform the procedure described in [“Starting a Server”](#) to change the state of the server to **STANDBY** state so that it is available if automatic switchover is needed or if manual switchover is desired.

## 6.5.5 Starting a Server

A server in **UNINITIALIZED "INHIBITED"** state cannot run the **LSMS** application and is not available as a standby server. Use the following procedure to change the state of a server from **UNINITIALIZED "INHIBITED"** to a state where it is available to run the **LSMS** application.

During the starting process on a given server, the **LSMS HA** utility checks to see if the other server is in **ACTIVE** state. Therefore, the state of the server at the end of this procedure will be one of the following:

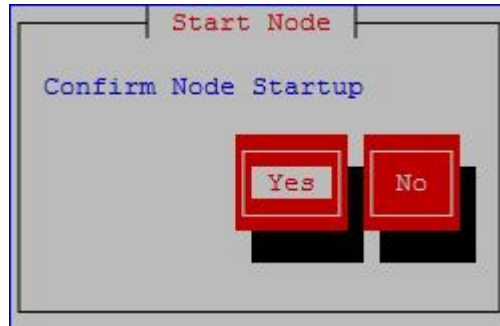
- If the other server is not in the **ACTIVE** state, this server will transition to **ACTIVE** state.
  - If the other server was in the **ACTIVE** state, this server will perform the following functions:
    - Copy the MySQL binary logs from the active server
    - Take a snapshot of the active server’s database
    - Transition to **STANDBY** state
    - Configure its MySQL to be a slave to the active server’s master
    - Start performing MySQL replication
1. Log in as the `lsmsmgr` user to the appropriate server, depending on the server states, as follows (for information about logging in as `lsmsmgr`, see [“Logging In to LSMS Server Command Line”](#)):
    - If both servers are in **UNINITIALIZED "INHIBITED"** state, log into the server that you want to make active.  
After you have finished this procedure on that server, repeat this procedure for the other server.
    - If one server is in **ACTIVE** state, log into the server that is not active.

**Note:**

Do not attempt to change the state of the server while any of the following processes are running on the active server: backups (automatic or manual), running the `import` command, running the `lsmsdb quickaudit` command, or creating query server snapshots, all of which use temporary storage space. If you attempt to change the state of the server while any of these processes are running, you may not have enough disk space to complete the process. Since backups can be run automatically, perform the procedure described in [“Checking for Running Backups”](#) to ensure that no backups are running.

2. From the main `lsmsmgr` interface, select **Maintenance**, and then **Start Node**.

The `lsmsmgr` interface displays.

**Figure 6-10 Starting a Server**

3. Ensure that the **Yes** button is highlighted and press Enter.

While the server is being started, the `lsmsmgr` interface disappears and text similar to the following is displayed on the command line when this procedure is being performed on a server (`lsmssec` in this example) in **UNINITIALIZED "INHIBITED"** state while the other server is in **ACTIVE** state:

```
LSMS starting up on lsmssec...
Checking status from active mate...
Running status on lsmspri node
Copying DB from active mate. Local node will become standby.
 This may take a while
LSMS shutting down lsmssec...
Syncing mate:/mnt/snap/ to /var/TKLC/lsms/db/
Sync'ed
LSMS starting up on lsmssec...
Unihibiting node lsmssec...
Startup of local node successful

Press enter to continue...
```

 **Note:**

The text that displays is different when this procedure is being performed when both servers were originally in **UNINITIALIZED "INHIBITED"** state, but the condition when both servers are in **UNINITIALIZED "INHIBITED"** state happens only during upgrade.

4. Press any key.

The `lsmsmgr` main menu is displayed again.

The state of the server will be as described in the beginning of this section. To display the server state, use the procedure described in [Determining the Server Status](#).

# Recovering from Site Failures

This chapter describes and compares various disaster backup strategies and describes how to prepare for disaster recovery. For each disaster recovery strategy, this chapter also describes the recovery procedures and a list of assumptions.

## 7.1 Introduction

The **LSMS** system administrator needs to plan a recovery strategy for situations when both the **LSMS** active server and the standby server are unable to receive data from the **NPAC**. This occurs when the **LSMS** hardware is unable to operate, perhaps due to a fire or a natural disaster.

This chapter describes and compares various disaster backup strategies and describes how to prepare for disaster recovery. For each disaster recovery strategy, this chapter also describes the recovery procedures and a list of assumptions.

## 7.2 Choosing a Disaster Backup Strategy

Choose one of the following backup strategies, in which a shadow **LSMS** is defined to be an entire **LSMS**, with its own service provider **ID**, located in a separate geographical location from the main **LSMS**:

- Active shadow
- Inactive shadow
- No shadow

The various backup strategies provide different methods for ensuring that the shadow **LSMS** contains the same data as the main **LSMS**.



### Note:

Whenever you must manually enter locally provisioned data at the shadow **LSMS**, be sure that you use the same service provider identifier (**SPID**) that was used to enter the same locally provisioned data at the main **LSMS**. For more information, see [Synchronizing Data Between the Main LSMS and Shadow LSMS](#).

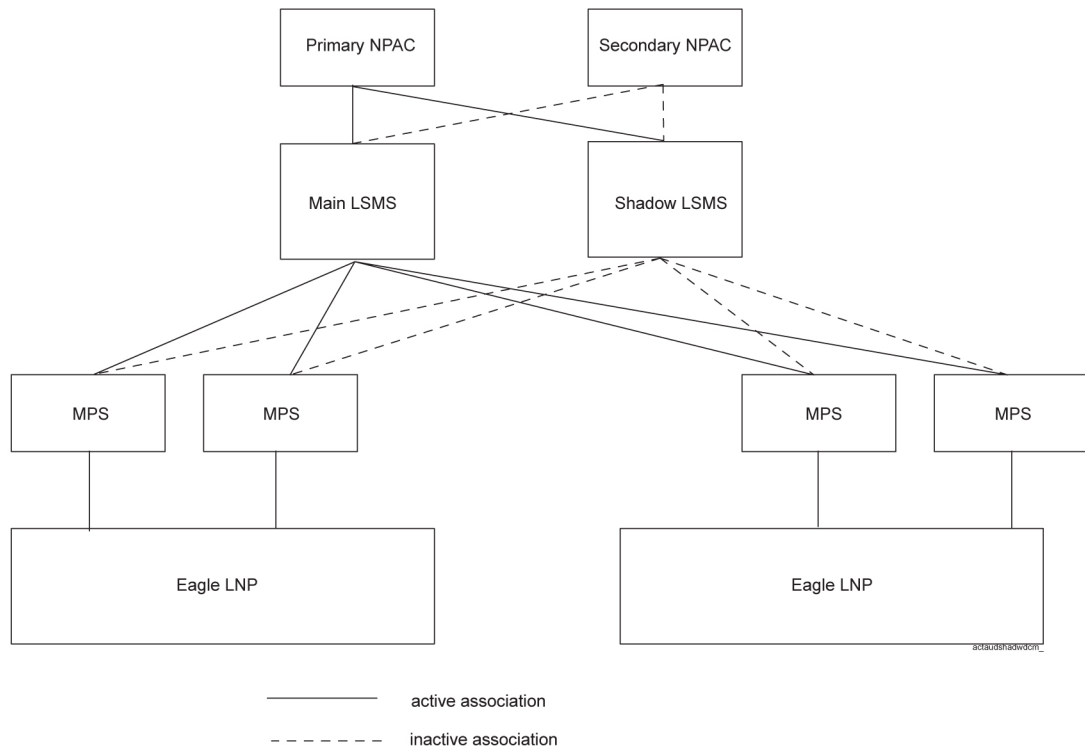
The following sections provide an overview of each strategy. Detailed descriptions or recovery procedures for each strategy are described in [Performing Disaster Recovery with an Active Shadow LSMS](#) through [Returning Operation from Shadow LSMS to Main LSMS](#).

### Using an Active Shadow

[Figure 7-1](#) shows the configuration of a main **LSMS** that uses an active shadow as its backup.

An active shadow **LSMS** is an entire **LSMS** that is active and has active associations with each **NPAC** from which the **LSMS** needs data (only one **NPAC** is shown in [Figure 7-1](#)).

**Figure 7-1 Overview of Main LSMS and Active Shadow LSMS**



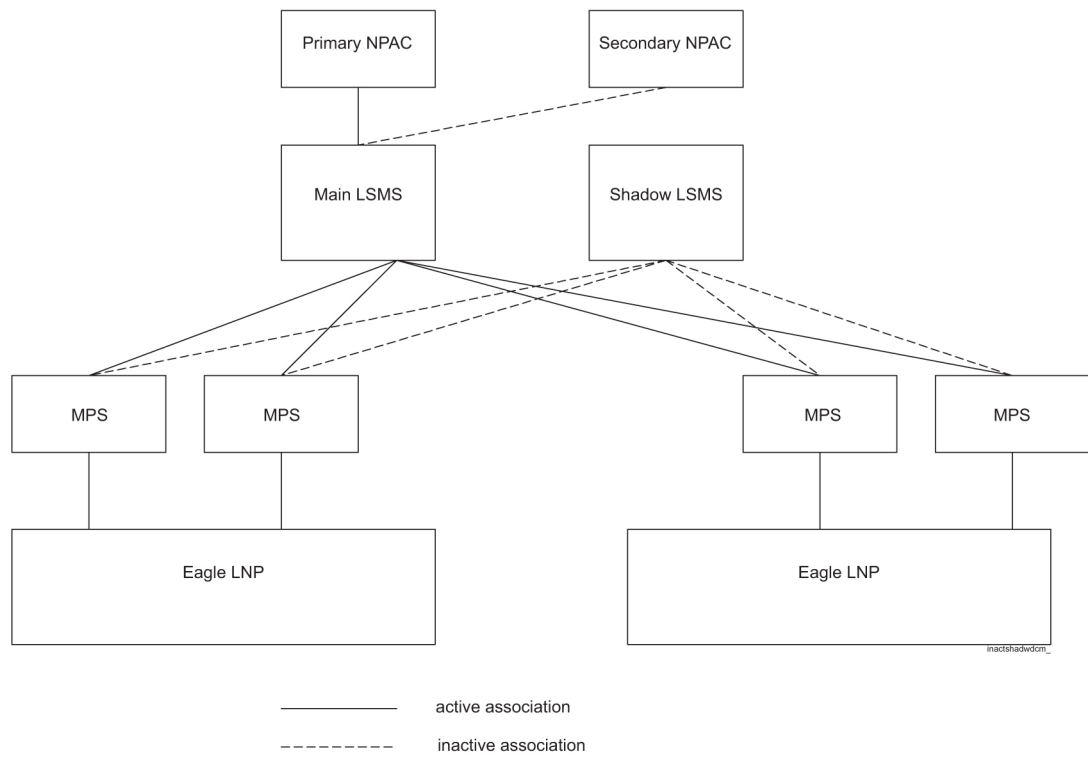
The disaster recovery backup strategy for this configuration provides the least out-of-service time for the **LSMS**. The recovery procedures for this strategy are described in [Performing Disaster Recovery with an Active Shadow LSMS](#).

### Using an Inactive Shadow

[Figure 7-3](#) shows the configuration of a main **LSMS** that uses an inactive shadow as its backup.

The shadow **LSMS** does not maintain active connections with the **NPACs** that supply data to the main **LSMS**. However, disaster recovery is still more feasible than using no shadow, especially for disaster situations in which the physical site of the main **LSMS** is damaged (such as fire or natural disaster).

**Figure 7-2 Overview of Main LSMS and Inactive Shadow LSMS**

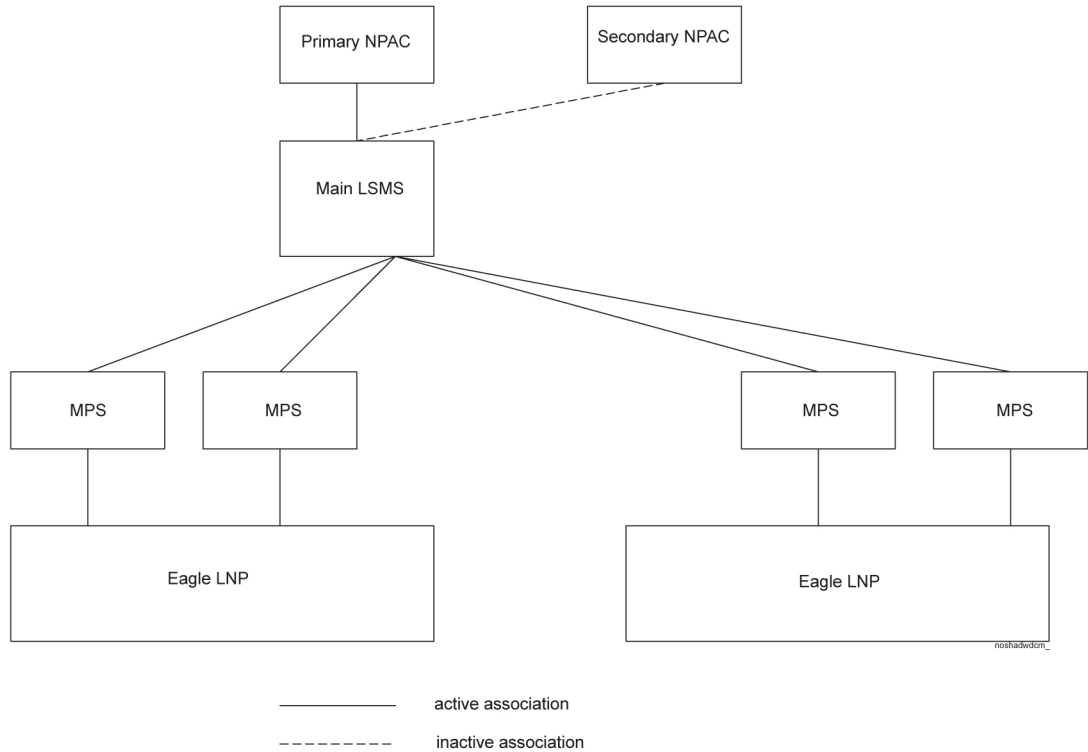


With this configuration, during disaster recovery you need to restore all databases from the NPAC. The recovery procedures are described in [Performing Disaster Recovery with an Inactive Shadow LSMS](#).

### Using No Shadow

[Figure 7-3](#) shows the configuration of a main **LSMS** that has no shadow as its backup.

**Figure 7-3 Overview of Main LSMS without a Shadow LSMS**



When no shadow **LSMS** exists, disaster recovery requires immediate repair of the main **LSMS** and its physical site, and then restore all databases from the NPAC. The recovery procedures are described in [Performing Disaster Recovery without a Shadow LSMS](#).

## 7.3 Synchronizing Data Between the Main LSMS and Shadow LSMS

Both **NPAC** data and locally provisioned data need to be synchronized between the main and shadow **LSMS** so that the shadow can take over when the main **LSMS** fails.

- **NPAC** data synchronization occurs in one of the following ways:
  - With an active shadow, active connections from both main and active shadow to the **NPACs** allow transmission of the same **NPAC** data to both **LSMSs**.
  - With an inactive shadow, **NPAC** data is synchronized by loading files from a backup tape and/or downloading files from the **NPAC** to the inactive shadow **LSMS**.
- Locally provisioned data must be manually entered at both the main **LSMS** and shadow **LSMS**.

 **Note:**

When you log in to manually enter any locally provisioned data, always use the same service provider ID (**SPID**) at both the main **LSMS** and the shadow **LSMS**. Locally provisioned data is correlated with a **SPID**. In order for the data to be the same at the main **LSMS** and shadow **LSMS**, it must be entered with the same **SPID** at both **LSMSs**. The main **LSMS** and shadow **LSMS** must use different **NPAC**-assigned **SPIDs** for their association with the **NPAC**. You can create **SPIDs** used just for entering data, or you can use the main **LSMS**'s **NPAC**-assigned **SPID** for entering locally provisioned data at both the main **LSMS** and shadow **LSMS**.

For information about manually entering locally provisioned data, refer to the *Database Administrator's Guide*.

## 7.4 Preparing for a Disaster Situation

For all recovery strategies, prepare for disaster situations by doing the following:

- Make sure that the following conditions are true:
  - The main **LSMS**, any restored **LSMS**, and the shadow **LSMS** have the required software licenses. Use the procedure described in [Verifying the Processes Running on the Active Server](#) for each server on each **LSMS**; licenses are required for processes to run.
  - Hardware and software versions on the main and shadow **LSMS** are identical.
  - Any optional features are installed and configured on both the main and shadow **LSMS**.
- Make sure the following items are always available and easy to locate:
  - The most recent database backup tape
  - **TPD** USB media
  - **LSMS** application USB media
  - Completed Disaster Recovery sheet, as shown in [Recovery Preparation Worksheet](#).

In addition, if you use an active shadow **LSMS**, make sure the following conditions are true:

- The shadow **LSMS** hardware has received the same required maintenance as the main **LSMS**.
- You have the ability to connect to the shadow **LSMS** using the **Secure Shell** (`ssh`).
- You have the ability to display **LSMS** applications on your workstation.
- The network connections from the network elements to the shadow **LSMS**, which are critical during a disaster, have been periodically tested. Networks are often subject to frequent changes, and these changes can affect your connection between the shadow **LSMS** and the network elements.
- Any data you have added, modified, or deleted on the main **LSMS** has also been added, modified, and deleted on the shadow **LSMS**.

At least annually, your site should prepare a drill in which the key personnel perform the disaster recovery procedure. This ensures that any potential problems or questions can be addressed in a non-emergency situation.



## 7.5 Determining When to Switch to Shadow LSMS

Switching to a shadow **LSMS** is the obvious solution in cases of fire or other destruction of the main **LSMS** site. In addition to these cases, some problems with the main **LSMS** may warrant switching to the shadow **LSMS**. These situations can be determined with the Surveillance feature.

If the Surveillance feature is active, it posts a notification every five minutes. If the Surveillance feature has detected an error, it posts a notification reporting the error. If no errors have been detected, the Surveillance feature posts the following “keep alive” message to indicate that the Surveillance feature is running, where <Host Name> indicates the host name of the server that is reporting the notification.

```
LSMS8000|14:58 Jun 22, 2000|<Host Name>|Keep alive
```

Absence of “keep alive” messages is an indication that a potential problem exists. Contact My Oracle Support for help in determining whether the problems warrants switching to the shadow **LSMS**.

For more information about the Surveillance feature, see [Understanding the Surveillance Feature](#). For more information about Surveillance notifications, see [Automatic Monitoring of Events](#).

## 7.6 Disaster Recovery Procedure Overview

[Table 7-1](#) provides an overview comparison of the procedures you should perform and the order in which to perform them, according to the disaster backup strategy you are using. Following sections describe each disaster backup strategy in more detail and list any conditions assumed.

**Table 7-1 Comparison of Recovery Procedures to Perform**

| Recovery Procedure<br>Note: This table is for comparison; for detailed procedures by strategy, see <a href="#">Table 7-2</a> through <a href="#">Table 7-4</a> . | Active Shadow <sup>a</sup> | Inactive Shadow <sup>a</sup> | No shadow <sup>b</sup> | Restoring Operations to the Main LSMS After Running on Active Shadow <sup>b</sup> | Restoring Operations to the Main LSMS After Running on Inactive Shadow <sup>b</sup> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------|------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                                                                                                  |                            |                              |                        |                                                                                   |                                                                                     |
| Repair or replace the <b>LSMS</b>                                                                                                                                |                            |                              | 1                      | 1                                                                                 | 1                                                                                   |
| Recovery acceptance test                                                                                                                                         | 1                          | 1                            | 2                      | 2                                                                                 | 2                                                                                   |

Table 7-1 (Cont.) Comparison of Recovery Procedures to Perform

| Recovery Procedure<br>Note: This table is for comparison; for detailed procedures by strategy, see <a href="#">Table 7-2</a> through <a href="#">Table 7-4</a> .    | Active Shadow <sup>a</sup> | Inactive Shadow <sup>a</sup> | No shadow <sup>b</sup> | Restoring Operations to the Main LSMS After Running on Active Shadow <sup>b</sup> | Restoring Operations to the Main LSMS After Running on Inactive Shadow <sup>b</sup> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------|------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Contact each <b>NPAC</b> from which the <b>LSMS</b> needs data to request download files                                                                            |                            | 2                            | 3                      |                                                                                   | 3                                                                                   |
| Contact each <b>NPAC</b> from which the <b>LSMS</b> needs data to provide it with the <b>IP</b> address with which to establish association to the mate <b>LSMS</b> |                            | 3                            |                        | 3 <sup>c</sup>                                                                    | 4                                                                                   |
| <b>FTP</b> data from <b>NPAC</b> and import it into the <b>LSMS</b>                                                                                                 |                            | 4                            | 4 <sup>c</sup>         | 4 <sup>c</sup>                                                                    | 5 <sup>c</sup>                                                                      |
| Start <b>LSMS GUI</b>                                                                                                                                               |                            | 5                            | 5                      | 5                                                                                 | 6                                                                                   |
| Add locally provisioned data that had been entered since last backup (or not already entered on mate <b>LSMS</b> )                                                  | 2                          | 6                            | 6                      | *                                                                                 | *                                                                                   |
| Reconnect network elements                                                                                                                                          | 3                          | 7                            | 7                      | 6                                                                                 | 7                                                                                   |

Table 7-1 (Cont.) Comparison of Recovery Procedures to Perform

| Recovery Procedure<br>Note: This table is for comparison; for detailed procedures by strategy, see <a href="#">Table 7-2</a> through <a href="#">Table 7-4</a> .                                                                                                                         | Active Shadow <sup>a</sup> | Inactive Shadow <sup>a</sup> | No shadow <sup>b</sup> | Restoring Operations to the Main LSMS After Running on Active Shadow <sup>b</sup> | Restoring Operations to the Main LSMS After Running on Inactive Shadow <sup>b</sup> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------|------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| If the disaster outage has lasted 7 days or less, perform a time range audit and reconcile to network elements and a full-range audit of <b>DGTT</b> , <b>OGTT</b> , and <b>NPA-Splits</b> (otherwise perform a bulk download to network elements and then reassociate network elements) | 4                          | 8                            | 8 <sup>c</sup>         | 7 <sup>c</sup>                                                                    | 8 <sup>c</sup>                                                                      |
| If query servers are installed, stop all directly connected query servers                                                                                                                                                                                                                | 5                          | 9                            |                        | 8                                                                                 | 9                                                                                   |
| If query servers are installed, configure each directly connected query server to use the <b>IP</b> address of the mate <b>LSMS</b> for its master host                                                                                                                                  | 6                          | 10                           |                        | 9                                                                                 | 10                                                                                  |
| If query servers are installed, reload each directly connected query server from the mate <b>LSMS</b>                                                                                                                                                                                    | 7                          | 11                           | 9                      | 10                                                                                | 11                                                                                  |

**Table 7-1 (Cont.) Comparison of Recovery Procedures to Perform**

| Recovery Procedure<br>Note: This table is for comparison; for detailed procedures by strategy, see <a href="#">Table 7-2</a> through <a href="#">Table 7-4</a> . |                            |                              |                        | Restoring Operations to the Main LSMS After Running on Active Shadow <sup>b</sup> | Restoring Operations to the Main LSMS After Running on Inactive Shadow <sup>b</sup> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------|------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                                                                                                  | Active Shadow <sup>a</sup> | Inactive Shadow <sup>a</sup> | No shadow <sup>b</sup> |                                                                                   |                                                                                     |
| Run on the shadow LSMS until main LSMS is restored                                                                                                               | 8                          | 12                           |                        |                                                                                   |                                                                                     |
| Return operations to restored main LSMS                                                                                                                          | 9 <sup>d</sup>             | 13 <sup>d</sup>              |                        |                                                                                   |                                                                                     |
| <sup>a</sup> Perform these procedures on the shadow LSMS.                                                                                                        |                            |                              |                        |                                                                                   |                                                                                     |
| <sup>b</sup> Perform these procedures on the main LSMS.                                                                                                          |                            |                              |                        |                                                                                   |                                                                                     |
| <sup>c</sup> Perform only as required.                                                                                                                           |                            |                              |                        |                                                                                   |                                                                                     |
| <sup>d</sup> As described in <a href="#">Table 7-5</a> (and summarized in the rightmost columns of this table).                                                  |                            |                              |                        |                                                                                   |                                                                                     |
| *Backups should always be scheduled immediately before switching from the shadow LSMS to the main LSMS; no additional data should have been locally provisioned. |                            |                              |                        |                                                                                   |                                                                                     |

## 7.7 Performing Disaster Recovery with an Active Shadow LSMS

In this configuration, an entire **LSMS** is active and has active associations with each **NPAC** from which the **LSMS** needs data. This disaster recovery backup strategy provides the least out-of-service time for the **LSMS**.

In addition to the assumptions listed in “[Preparing for a Disaster Situation](#)”, the following conditions are assumed:

- Both the main **LSMS** and shadow **LSMS** are associated with each **NPAC** (up to eight) from which the **LSMS** needs data, and both the main **LSMS** and the shadow **LSMS** are receiving automatic updates. Each regional **NPAC** database at both **LSMS** sites is synchronized with the **NPACs**.
- A network connection from each serviced network element to the shadow **LSMS** exists, but the network element is not associated with the shadow **LSMS** at the time the main **LSMS** fails.
- Users, groups, and passwords are identically configured at the main **LSMS** and shadow **LSMS**.
- Any data locally provisioned at the main **LSMS** is also locally provisioned at the shadow **LSMS**.

Perform the procedures shown in [Table 7-2](#) on the shadow **LSMS** when a disaster occurs on the main **LSMS**.

**Table 7-2 Recovery Procedures When LSMS Shadow Is Active**

| Active  | In the order shown, perform the following recovery procedures:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | <p>(Optional) Recovery acceptance test on active server of shadow LSMS:</p> <ol style="list-style-type: none"> <li>1. <a href="#">Verifying the State of the Servers</a></li> <li>2. <a href="#">Verifying the Processes Running on the Active Server</a> (with primary server as active server)</li> <li>3. <a href="#">Verifying the GUI Operability on the Active Server</a> (with primary server as active server)</li> </ol> <div>  <b>Note:</b><br/>Do not switch over to the shadow LSMS's standby server until all EMSs have been resynchronized because all queued subscription data would be immediately flushed.         </div> |
| 2       | Add any locally provisioned data that may have been added to the main LSMS before it failed and has not yet been added to the active shadow.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3       | Perform the procedures in <a href="#">"Reconnecting Network Elements"</a> (start with 4 and use the main LSMS as the source and the shadow LSMS as the destination).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4       | For each network element, perform a time-range audit (specify the start time to be one hour before the outage occurred) and a full-range audit of <b>DGTT</b> , <b>OGTT</b> , and <b>NPA</b> Splits. For information about performing audits, refer to "Audit and Optional Reconcile from the <b>LSMS GUI</b> " in the <i>LNP Database Synchronization User's Guide</i> .                                                                                                                                                                                                                                                                                                                                                    |
| 5, 6, 7 | <p>If any query servers are installed:</p> <ol style="list-style-type: none"> <li>1. Stop the directly connected query servers.</li> <li>2. Configure each directly connected query server to use the shadow LSMS as its master host (refer to the procedure described in "MySQL Replication Configuration for Query Servers" in the <i>Configuration Guide</i>).</li> <li>3. For each directly connected query server, perform the procedure in <a href="#">"Reload a Query Server Database from the LSMS"</a>.</li> </ol>                                                                                                                                                                                                  |
| 8       | Run on the shadow LSMS until the main LSMS is restored.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 9       | <a href="#">Returning Operation from Shadow LSMS to Main LSMS</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## 7.8 Performing Disaster Recovery with an Inactive Shadow LSMS

In this disaster recovery strategy, you have a complete **LSMS** system installed at a geographically remote site, but it is not running and does not receive updates from the **NPAC** until you perform the procedures described in this section. This strategy requires a much

longer recovery period than having an active shadow requires, but is still much safer than having no shadow. Having no shadow can result in a very long recovery period in serious disaster situations, such as fire or natural disaster.

In addition to the assumptions listed in “Preparing for a Disaster Situation”, the following conditions are assumed:

- At the shadow site, all hardware and software components have already been installed and passed an acceptance test.
- At the main **LSMS**, valid backups exist for all data. These backups are ready to be shipped to the shadow **LSMS**.
- A network connection exists between the shadow **LSMS** and each network element and each **NPAC**. At the time of failure, the shadow **LSMS** is not associated with any of the network elements or **NPACs**.

Perform the procedures shown in Table 7-3 on the shadow **LSMS** when a disaster occurs on the main **LSMS**.

**Table 7-3 Recovery Procedures When LSMS Shadow Is Inactive**

| Inactive | In the order shown, perform the following recovery procedures:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | Recovery acceptance test on inactive shadow <b>LSMS</b> :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1        | <ol style="list-style-type: none"> <li>1. <a href="#">Verifying the State of the Servers</a></li> <li>2. <a href="#">Verifying the Processes Running on the Active Server</a> (with primary server as active server)</li> <li>3. <a href="#">Verifying the GUI Operability on the Active Server</a> (with primary server as active server)</li> <li>4. <a href="#">Manually Switching Over from the Active Server to the Standby Server</a></li> <li>5. <a href="#">Verifying the Processes Running on the Active Server</a> (with secondary server as active server)</li> <li>6. <a href="#">Verifying the GUI Operability on the Active Server</a> (with secondary server as active server)</li> <li>7. <a href="#">Manually Switching Over from the Active Server to the Standby Server</a></li> </ol> |
| 2, 3     | <p>Contact each <b>NPAC</b> from which the <b>LSMS</b> needs data to:</p> <ul style="list-style-type: none"> <li>• Provide them with the <b>IP</b> address with which to establish association to the shadow <b>LSMS</b>.</li> <li>• Request which files will be needed to download to the shadow <b>LSMS</b>. It is recommended that the request be for all <b>NPAC</b> files dated from one hour before the time shown on the backup tape.</li> </ul>                                                                                                                                                                                                                                                                                                                                                   |
| 4        | <b>FTP</b> data from the <b>NPAC</b> and import it into the <b>LSMS</b> (see <a href="#">Downloading Files from an NPAC to the LSMS</a> ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 5        | Start the <b>LSMS GUI</b> (association with each <b>NPAC</b> is automatically attempted).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 6        | At the shadow, add any locally provisioned data that needs to be added.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|          | At shadow, manually enter any locally provisioned data that had been entered at the main since the last backup tape was made.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

**Table 7-3 (Cont.) Recovery Procedures When LSMS Shadow Is Inactive**

| Inactive | In the order shown, perform the following recovery procedures:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7        | Perform the procedures described in <a href="#">“Reconnecting Network Elements”</a> .<br><br>If the disaster outage has lasted for 7 days or less, for each network element, perform a time-range audit (specify the start time to be one hour before the outage occurred) and a full-range audit of <b>DGTT</b> , <b>OGTT</b> , and <b>NPA</b> Splits. For information about performing audits, refer to “Audit and Optional Reconcile from the <b>LSMS GUI</b> ” in the <i>LNP Database Synchronization User’s Guide</i> . |
| 8        | (If the disaster outage has lasted more than 7 days, perform a complete bulk download from the shadow <b>LSMS</b> to each network element. For information about performing bulk downloads to network elements, refer to the <i>LNP Database Synchronization User’s Guide</i> .)<br><br>If any query servers are installed:                                                                                                                                                                                                  |
| 9, 10,11 | <ol style="list-style-type: none"> <li>1. Stop the directly connected query servers.</li> <li>2. Configure each directly connected query server to use the shadow <b>LSMS</b> as its master host (refer to the procedure described in “MySQL Replication Configuration for Query Servers” in the <i>Configuration Guide</i>).</li> <li>3. For each directly connected query server, perform the procedure in <a href="#">Reload a Query Server Database from the LSMS</a>.</li> </ol>                                        |
| 12       | Run on the shadow <b>LSMS</b> until the main <b>LSMS</b> is restored.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 13       | After main <b>LSMS</b> has been repaired, <a href="#">“Returning Operation from Shadow LSMS to Main LSMS”</a> .                                                                                                                                                                                                                                                                                                                                                                                                              |

## 7.9 Performing Disaster Recovery without a Shadow LSMS

In this disaster backup strategy, you have no physical backup for the **LSMS**. In a disaster situation, you must restore the main **LSMS**. Having no shadow can result in a very long recovery period in serious disaster situations, such as fire or natural disaster.

In addition to the assumptions listed in [“Preparing for a Disaster Situation”](#), the following conditions are assumed for this procedure:

- The main **LSMS** is restored at the same physical site. If another site is used, you must perform site survey and preparation as you do for any initial **LSMS** installation. For more information about installing **LSMS**, refer to *Application B Card Hardware and Installation Guide*.
- A network connection exists between the restored main **LSMS** and each **NPAC** and network element.

Perform the procedures shown in [Table 7-4](#) to restore the main **LSMS** when a disaster occurs.

**Table 7-4 Recovery Procedures When No LSMS Shadow Exists**

| No shadow | In the order shown, perform the following recovery procedures:                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1, 2      | Contact My Oracle Support to arrange repair or replacement of the <b>LSMS</b> . Oracle will dispatch technicians who will perform repairs, return the <b>LSMS</b> to operational status, and perform recovery acceptance tests.                                                                                                                                                                                                                                                                                     |
| 3         | Contact each <b>NPAC</b> from which the <b>LSMS</b> needs data to request which files will be needed to download to the shadow <b>LSMS</b> . It is recommended that the request be for all <b>NPAC</b> files dated from one hour before the time shown on the backup tape.                                                                                                                                                                                                                                          |
| 4         | <b>FTP</b> data from <b>NPAC</b> and import it into the <b>LSMS</b> (see <a href="#">Downloading Files from an NPAC to the LSMS</a> ).                                                                                                                                                                                                                                                                                                                                                                              |
| 5         | Start the <b>LSMS GUI</b> (association with each <b>NPAC</b> is automatically attempted).                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 6         | If any locally provisioned data needs to be added, add it.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7         | Perform the procedures in <a href="#">"Reconnecting Network Elements"</a> .<br><br>If the disaster outage has lasted for 7 days or less, for each network element, perform a time-range audit (specify the start time to be one hour before the outage occurred) and a full-range audit of <b>DGTT</b> , <b>OGTT</b> , and <b>NPA Splits</b> . For information about performing audits, refer to "Audit and Optional Reconcile from the <b>LSMS GUI</b> " in the <i>LNP Database Synchronization User's Guide</i> . |
| 8         | (If the disaster outage has lasted more than 7 days, perform a complete bulk download to each network element. For information about performing bulk downloads to network elements, refer to the <i>LNP Database Synchronization User's Guide</i> .)                                                                                                                                                                                                                                                                |
| 9         | If any query servers are installed, for each directly connected query server, perform the procedure in <a href="#">"Reload a Query Server Database from the LSMS"</a> .                                                                                                                                                                                                                                                                                                                                             |

## 7.10 Returning Operation from Shadow LSMS to Main LSMS

Use the procedures described in this section to return operations from the shadow **LSMS** to the main **LSMS** after the main **LSMS** has been restored. Do not take the shadow **LSMS** out of service until you have completed this procedure, including the resynchronization of **LNP** data with the **NPAC** and network elements. If any problem occurs during the restoration of operations to the main **LSMS**, you can return to using the shadow **LSMS**.

In addition to the assumptions listed in ["Preparing for a Disaster Situation"](#), the following conditions are assumed:

- The main **LSMS** is restored at the same physical site. If another site is used, you must perform site survey and preparation as you do for any initial **LSMS** installation. For more information about installing **LSMS**, refer to *Application B Card Hardware and Installation Guide*.
- A network connection exists between the restored main **LSMS** and each **NPAC** and network element.
- Encryption keys have been exchanged between the **NPAC** and the restored main **LSMS**.



- License keys are valid for the main **LSMS**.
- At the main **LSMS**, valid backups exist for all data.
- At a previously inactive shadow **LSMS**, valid backups exist for all data. A complete backup should be scheduled immediately before the scheduled return to the main **LSMS**, so that no locally provisioned data is entered after the switch back to the main **LSMS**.

Perform the procedures shown in [Table 7-5](#) to restore the main **LSMS**.

**Table 7-5    Procedures to Return Operations from Shadow LSMS to Main LSMS**

| Restoring Operations to the Main LSMS After Running on Active Shadow Main LSMS | Restoring Operations to the Main LSMS After Running on Previously Inactive Shadow | In the order shown in the appropriate column, perform the following recovery procedures:                                                                                                    |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                                              | 1                                                                                 | Contact My Oracle Support to arrange repair or replacement of the <b>LSMS</b> . Oracle will dispatch technicians who will perform repairs and return the <b>LSMS</b> to operational status. |
| 2                                                                              | 2                                                                                 | Recovery acceptance test or manufacturing acceptance test, depending on the severity of original failure (performed by technicians).                                                        |

Table 7-5 (Cont.) Procedures to Return Operations from Shadow LSMS to Main LSMS

| Restoring Operations to the Main LSMS After Running on Active Shadow Main LSMS | Restoring Operations to the Main LSMS After Running on Previously Inactive Shadow | In the order shown in the appropriate column, perform the following recovery procedures:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3                                                                              | 3                                                                                 | <p>After the My Oracle Support personnel have performed an acceptance test, if desired, customers may wish to perform the following tests to verify that the restored main <b>LSMS</b> is fully functional:</p> <ol style="list-style-type: none"> <li>1. <a href="#">Verifying the State of the Servers</a></li> <li>2. <a href="#">Verifying the Processes Running on the Active Server</a> (with primary server as active server)</li> <li>3. <a href="#">Verifying the GUI Operability on the Active Server</a> (with primary server as active server)</li> <li>4. <a href="#">Manually Switching Over from the Active Server to the Standby Server</a></li> <li>5. <a href="#">Verifying the Processes Running on the Active Server</a> (with secondary server as active server)</li> <li>6. <a href="#">Verifying the GUI Operability on the Active Server</a> (with secondary server as active server)</li> <li>7. <a href="#">Manually Switching Over from the Active Server to the Standby Server</a></li> </ol> |
| 3                                                                              | 4                                                                                 | <p>If any <b>NPAC</b> data may be updated during the period of time between when you plan to disconnect the shadow <b>LSMS</b> and connect with the main <b>LSMS</b>, contact each <b>NPAC</b> from which the <b>LSMS</b> needs data and request download files for that time period.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                | 5                                                                                 | <p>If returning from a shadow <b>LSMS</b> that was previously inactive, contact each <b>NPAC</b> from which the <b>LSMS</b> needs data to provide them with the <b>IP</b> address with which to establish association to the main <b>LSMS</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

Table 7-5 (Cont.) Procedures to Return Operations from Shadow LSMS to Main LSMS

| Restoring Operations to the Main LSMS After Running on Active Shadow Main LSMS | Restoring Operations to the Main LSMS After Running on Previously Inactive Shadow | In the order shown in the appropriate column, perform the following recovery procedures:                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4                                                                              | 6                                                                                 | If any download files were requested from any <b>NPAC</b> above, <b>FTP</b> the files and import them into the <b>LSMS</b> (see <a href="#">Downloading Files from an NPAC to the LSMS</a> ).                                                                                                                                                                                                                                                                                                                                    |
| 5                                                                              | 7                                                                                 | Start the <b>LSMS GUI</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 6                                                                              | 8                                                                                 | Perform the procedures in “ <a href="#">Reconnecting Network Elements</a> ”, where the source <b>LSMS</b> is the shadow <b>LSMS</b> , and the destination <b>LSMS</b> is the main <b>LSMS</b> .                                                                                                                                                                                                                                                                                                                                  |
| 7                                                                              | 9                                                                                 | For each network element, perform a time-range audit (specify the start time to be one hour before the outage occurred) and a full-range audit of <b>DGTT</b> , <b>OGTT</b> , and <b>NPA</b> Splits. For information about performing audits, refer to “Audit and Optional Reconcile from the <b>LSMS GUI</b> ” in the <i>LNP Database Synchronization User's Guide</i> .                                                                                                                                                        |
| 8, 9, 10                                                                       | 10, 11, 12                                                                        | <p>If any query servers are installed:</p> <ol style="list-style-type: none"> <li>1. Stop the directly connected query servers.</li> <li>2. Configure each directly connected query server to use the main <b>LSMS</b> as its master host (refer to the procedure described in “MySQL Replication Configuration for Query Servers” in the <i>Configuration Guide</i>).</li> <li>3. For each directly connected query server, perform the procedure in “<a href="#">Reload a Query Server Database from the LSMS</a>”.</li> </ol> |

## 7.11 Resynchronizing After an Outage Between an NPAC and the LSMS

When an outage between the **LSMS** and **NPAC** occurs, the **LSMS** attempts to resynchronize automatically as soon as the association is reestablished. The **NPAC** then resends to the **LSMS** all transactions that were missed by the **LSMS**.

### Automatic Resynchronization between the NPAC and the LSMS

Whenever association is reestablished between the **NPAC** and the **LSMS**, the **NPAC** and the **LSMS** automatically resynchronize their databases. The time required for automatic resynchronization between an **NPAC** and the **LSMS** is directly proportional to the number of transactions that need to be sent. If you believe you have a lot of subscription version records, you can choose to perform a manual **NPAC/LSMS** recovery, as described in [Downloading Files from an NPAC to the LSMS](#).

If the **NPAC** and the **LSMS** are unable to complete automatic recovery, one of the following notifications will display on the **LSMS** console window, where either `PRIMARY` or `SECONDARY` indicates the **NPAC** for which recovery is underway:

```
[Critical] 2018: 99-07-05 12:55:56 NPAC [<PRIMARY|SECONDARY>] Recovery Failed
```

or

```
[Critical] 2019: 99 -07-05 12:55:56 NPAC [<PRIMARY|SECONDARY>] Recovery
Partial Failure
```

If you receive one of these messages, perform the procedure described in [Downloading Files from an NPAC to the LSMS](#) using the example for performing a bulk download of files from the **NPAC**.

## 7.12 Reconnecting Network Elements

The following procedures explain how to reconnect the **LSMS** with network element software that manages database updates from the **LSMS**. Reconnecting is required in one of the following situations:

- When you switch from the main **LSMS** to the shadow **LSMS** after a disaster has occurred
- When you switch from the shadow **LSMS** back to the main **LSMS** after the main **LSMS** has been restored
- When you restore an **LSMS** that had no shadow

Perform the procedures described in the following sections. (In these procedures, the “source **LSMS**” is the **LSMS** you switch from and the “destination **LSMS**” is the **LSMS** you switch to.)

1. [“Preparing to Reconnect Network Elements”](#)
2. [“Reconnecting Network Elements Procedures”](#)

These procedures will be followed by automatic resynchronization as described in [Automatic Resynchronization after Reconnect](#).

## Preparing to Reconnect Network Elements

1. Locate the completed Disaster Recovery Sheet, a current system backup tape, and a current database backup tape.

2. Alert the My Oracle Support that you are switching to the destination **LSMS**.

My Oracle Support will remain online to provide support during this procedure.

3. From the network element, enter the following command to verify that the destination **LSMS** is reachable, where `<LSMS_IP_Address>` is the **IP** address of the **LSMS**:

```
> ping <LSMS_IP_Address>
```

4. From the destination **LSMS**, enter the following command to verify that the network element (**NE**) is reachable:

```
ping <ELAP_IP_Address>
```

5. If the destination **LSMS** is not already running, log in as a user in the `lsmsadm` group to the destination **LSMS** and start an **LSMS GUI** session.

Verify that the destination **LSMS** is in stable condition by checking the following:

- a. Verify that there are no active alarm conditions.

Because the destination **LSMS** is not connected with the **EMS**, there are always error messages regarding the network element queue level alarms and its connection with the **LSMS**. For a destination **LSMS**, these messages are normal. If the Surveillance feature is active, these normal messages will be notifications `LSMS 0004` and `LSMS 8003` or `LSMS 8004`. (For more information, see [Automatic Monitoring of Events](#))

- b. Verify that the **NPACs** are connected to the **LSMS** by examining the **NPAC** status area on a graphical user interface; verify that the **NPAC** icon for each supported **NPAC** displays green.

- c. Use following method to verify that no **LSMS** hardware failure indications are present:

If the Surveillance feature is active, verify that no hardware failure notifications (`LSMS 4003`, `LSMS 2000`, `LSMS 0001`, `LSMS 4004`, `LSMS 4005`, `LSMS 4006`, `LSMS 4007`, or `LSMS 4009`) have been posted. For more information about these notifications, see [Automatic Monitoring of Events](#)

- d. Verify that the **LSMS** is not currently in recovery mode with any **NPAC** by ensuring that none of the following **GUI** notifications have been posted for any **NPAC**, where `<PRIMARY|SECONDARY>` indicates whether the **NPAC** to be connected is the primary **NPAC** or the secondary **NPAC**:

```
[Critical]: <Timestamp> 2006: NPAC <PRIMARY|SECONDARY> Bind Timed Out -
Auto retry after 2 min
[Critical]: <Timestamp> 2007: NPAC <PRIMARY|SECONDARY> Connection
Aborted by PEER - Auto retry same host
after 2 min
[Critical]: <Timestamp> 2008: NPAC <PRIMARY|SECONDARY> Connection
Aborted by PEER - Auto retry other host
after 2 min
[Critical]: <Timestamp>: 2009 NPAC <PRIMARY|SECONDARY> Connection
Aborted by Provider - Auto retry same
host after 2 min
[Critical]: <Timestamp> 2010: NPAC <PRIMARY|SECONDARY> Connection
Aborted due to recovery failure - Auto
retry after 2 min
```

```
[Critical]: <Timestamp> 2012: NPAC <PRIMARY|SECONDARY> Connection
Attempt Failed : Access Control Failure
[Critical]: <Timestamp> 2014: NPAC <PRIMARY|SECONDARY> Connection
Attempt Failed : Access Denied
[Critical]: <Timestamp> 2015: NPAC <PRIMARY|SECONDARY> Connection
disconnected by NPAC
[Critical]: <Timestamp> 2018: NPAC iiii Recovery Failed
[Critical]: <Timestamp> 2019: NPAC iiii Recovery Partial Failure
[Critical]: <Timestamp> 2020: NPAC iiii Security Violation. Association
aborted
```

Also, if the Surveillance feature is active, verify that none of the following Surveillance notifications have been posted for any **NPAC**, where `xxxxxxx` is the hostname of the server reporting the notification, `<PRIMARY|SECONDARY>` indicates the primary or secondary **NPAC**, `<NPAC_cust_ID>` is a numeric indicator for the **NPAC** region, and `<NPAC_IP_address>` is the **IP** address of the **NPAC**:

```
LSMS2000|14:58 Jul 22, 1997|xxxxxxx|Notify:Sys Admin - NPAC interface
failure
LSMS2001|14:58 Jul 22, 1997|xxxxxxx|Notify:Sys Admin - NPAC= <PRIMARY|
SECONDARY> - <NPAC_cust_ID>
LSMS2002|14:58 Jul 22, 1997|xxxxxxx|Notify:Sys Admin - NPAC=
<NPAC_IP_address>
```

If any of these notifications has been posted, verify that the following **GUI** notifications have been posted for the same **NPAC**:

```
[Cleared] 2025: <Timestamp>: NPAC <PRIMARY|SECONDARY> Connection
Successfully established
[Cleared] 8055: <Timestamp>: NPAC <PRIMARY|SECONDARY> Recovery Complete
```

Continue with the next procedure.

## 7.12.1 Reconnecting Network Elements Procedures

Perform the following procedure:

1. At the source **LSMS**, log in as `lsmsadm` on the active server.
2. Enter the following command to display the status of all `eagleagent` processes: `eagle status`

Scan the output for the names of all active **EAGLE** agents, similar to the values shown in **bold** in the following example:

```
CLLI Pid State Resync Conn A Conn B DCM
EBDA Debug Queue
Memory CPU Timestamp 1190801
 13622 A_ACTIVE COMPLETE ACTIVE STANDBY NONE IDLE
OFF 0 % 71
M 0.1 % 13:00:40
```

3. At the source **LSMS**, for each EAGLE agent process that is running, enter the following command to stop the EAGLE agent processes (<CLLI> is the **Common Language Location Identifier** for the **EAGLE** node):

```
$LSMS_DIR/eagle stop <CLLI>
```

For the example shown in step 2, you would enter the following commands:

```
$LSMS_DIR/eagle stop 1190801
```

4. At the destination **LSMS**, for each network element serviced by the **LSMS**, do one of the following:
  - In an inactive shadow configuration, create the **EMS** for the given network element (refer to the *Configuration Guide*, “Creating an **EMS** Configuration Component”). When you finish creating the **EMS**, `sentryd` process automatically starts the Eagle agent.
  - In an active shadow configuration, modify the **EMS** for the given network element (refer to the *Configuration Guide*, “Modifying an **EMS** Configuration Component”). Next, stop and restart the Eagle agent for the given **CLLI** using the following commands, then go to [“Automatic Resynchronization after Reconnect”](#).

```
$LSMS_DIR/eagle stop <CLLI>
```

```
$LSMS_DIR/eagle start <CLLI>
```

Next, the **LSMS** and the network elements will automatically resynchronize as described in [“Automatic Resynchronization after Reconnect”](#).

#### Automatic Resynchronization after Reconnect

When the **LSMS** and **MPS** are reconnected, the **LSMS** automatically starts an automatic resynchronization of the databases. For more information, see “Automatic Resynchronization Process” in the *LNP Database Synchronization User's Guide*. If the **LSMS** cannot complete automatic resynchronization, it posts a notification to the **LSMS GUI**. For more information, refer to “Notifications that **Database** Maintenance Is Required” in the *LNP Database Synchronization User's Guide*.

If the Surveillance feature is active, the following Surveillance notification is also posted, where <Host Name> is the hostname and <CLLI> is the 11-character **CLLI** code of the network element:

```
LSMS8001|14:58 Jul 22, 1997|<Host Name>|Notify:Sys Admin - NE CLLI=<CLLI>
```

# 8

## Verifying Recovery

This chapter describes procedures used to verify the status of the **LSMS** after performing recovery procedures.

### 8.1 Introduction

This chapter describes procedures used to verify the status of the **LSMS** after performing recovery procedures.

### 8.2 Verifying that the LSMS Is Fully Functional

Perform the tests in the order shown in [Table 8-1](#) to verify that the **LSMS** is fully functional following file system restoration. If any of these tests fail, contact My Oracle Support.

**Table 8-1 Recovery Acceptance Tests**

|   | Condition to Verify                                                                 | Test to Perform                                                                      |
|---|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1 | One server is in <b>ACTIVE</b> state and the other server is in <b>STANDY</b> state | <a href="#">Verifying the State of the Servers</a>                                   |
| 2 | The appropriate software processes are running on the primary server                | <a href="#">Verifying the Processes Running on the Active Server</a>                 |
| 3 | The <b>GUI</b> process can be started on the primary server                         | <a href="#">Verifying the GUI Operability on the Active Server</a>                   |
| 4 | Switchover can be performed from the active server to the standby server            | <a href="#">Manually Switching Over from the Active Server to the Standby Server</a> |
| 5 | The appropriate software processes can be run on the newly active server            | <a href="#">Verifying the Processes Running on the Active Server</a>                 |
| 6 | The <b>GUI</b> process can be started on the newly active server                    | <a href="#">Verifying the GUI Operability on the Active Server</a>                   |
| 7 | Switchover can be performed from the active server to the standby server            | <a href="#">Manually Switching Over from the Active Server to the Standby Server</a> |
| 8 | The appropriate software processes can be run on the newly active server            | <a href="#">Verifying the Processes Running on the Active Server</a>                 |
| 9 | The <b>GUI</b> process can be started on the newly active server                    | <a href="#">Verifying the GUI Operability on the Active Server</a>                   |

#### 8.2.1 Verifying the State of the Servers

Use the **TPD High Availability (HA)** utility to verify that one server is in **ACTIVE** state and the other server is in **STANDBY** state. See [Determining the Server Status](#).

#### 8.2.2 Verifying the Processes Running on the Active Server

1. Log in to the active server as `root`.



2. Display the status of all processes that are configured to run on the active server by entering each of the following commands and examining their outputs:

```
/usr/TKLC/plat/bin/syscheck -v proc run
/usr/TKLC/plat/bin/syscheck -v lsmshc proc
```

The following sample output from `syscheck -v proc run` indicates which processes are configured to be running on the active server and that all expected instances of the processes are running:

```
Running modules in class proc...
run: Checking supman...
run: Found 1 instance(s) of the supman process.
run: Checking lsman...
run: Found 1 instance(s) of the lsman process.
run: Checking npacagent...
run: Found 1 instance(s) of the npacagent process.
run: Checking eagleagent...
run: Found 2 instance(s) of the eagleagent process.
run: Checking rmtpmgr...
run: Found 1 instance(s) of the rmtpmgr process.
run: Checking rmtpage...
run: Found 1 instance(s) of the rmtpage process.
run: Checking reportman...
run: Found 1 instance(s) of the reportman process.
run: Checking lsmslogd...
run: Found 1 instance(s) of the lsmslogd process.
run: Checking sentryd...
run: Found 1 instance(s) of the sentryd process.
run: Checking survMon...
run: Found 1 instance(s) of the survMon process.
run: Checking smartd...
run: Found 1 instance(s) of the smartd process.
run: Checking atd...
run: Found 1 instance(s) of the atd process.
run: Checking crond...
run: Found 1 instance(s) of the crond process.
run: Checking sshd...
run: Found 7 instance(s) of the sshd process.
run: Checking syscheck...
run: Found 1 instance(s) of the syscheck process.
run: Checking syslogd...
run: Found 1 instance(s) of the syslogd process.
Return string: "OK"
OK
The log is available at:
-->/var/TKLC/log/syscheck/fail_log
```

If you see **FAILURE** (similar to the following example) for any process except the **GUI** process, contact My Oracle Support:

```
run: Only 0 instance(s) of lsmslogd running. 1 instance(s) required.
```

The following sample output from `syscheck -v lsmshc proc` indicates which processes are configured to be running on the active server and that all expected instances of the processes are running:

```
Running modules in class lsmshc...
 proc: Node active, checking
 proc: Checking supman...
 proc: Found 1 instance(s) of the supman process.
 proc: Checking lsman...
 proc: Found 1 instance(s) of the lsman process.
 proc: Checking npacagent...
 proc: Found 1 instance(s) of the npacagent process.
 proc: Checking eagleagent...
 proc: Found 1 instance(s) of the eagleagent process.
 proc: Checking rmtpmgr...
 proc: Found 1 instance(s) of the rmtpmgr process.
 proc: Checking rmtpageant...
 proc: Found 1 instance(s) of the rmtpageant process.
 proc: Checking reportman...
 proc: Found 1 instance(s) of the reportman process.
 proc: Checking lsmslogd...
 proc: Found 1 instance(s) of the lsmslogd process.
 proc: Checking sentryd...
 proc: Found 1 instance(s) of the sentryd process.
Return string: "OK"
 OK
The log is available at:
-->/var/TKLC/log/syscheck/fail_log
```

## 8.2.3 Verifying the GUI Operability on the Active Server

Perform the following procedure to verify that the **LSMS** graphical user interface will open:

1. Perform the procedure described in [“Logging In to LSMS Server Command Line”](#) using the hostname of the active server.
2. Perform the procedure described in [Starting a Web-Based LSMS GUI Session](#), using an **NPAC**-provided Service Provider ID.
3. Select **Exit/Logout** from the **User/Session** menu on the **LSMS** Console window.

The console logout window displays. Click **OK** to complete the logout.

# 9

## Field Replaceable Units

This chapter describes the components of an E5-APP-B card that can be replaced in the field and includes procedures for replacing each type of field replaceable unit (**FRU**).

### 9.1 Introduction

Oracle Communication EAGLE Application B Cards (E5-APP-B) are complete application server platforms and are designed for the high-availability environments required by telephony networks. They are installed in an EAGLE shelf.

Even with the advanced reliability of the E5-APP-B design, hardware failures may still occur. The E5-APP-B card is designed for easy maintenance when replacements are needed.

This chapter highlights the E5-APP-B card components that are field replaceable units (**FRU**) and provides procedures for replacing them.

This chapter explains how to remove a card from the EAGLE. The procedures include the administrative commands required to take a card out of service and place it back into service.

In the event a numbered event message is encountered, refer to the appropriate procedure in the *Unsolicited Alarm and Information Messages Reference*.

Additional information about each command can be found in the *EAGLE Commands User's Guide*.

### 9.2 E5-APP-B Card FRUs and Part Numbers

The following **E5-APP-B** card components can be replaced in the field:

- **E5-APP-B** cards (P/N 870-3096-01 and P/N 870-3096-02)
- Drive modules (P/N 870-3097-01 and P/N 870-3097-02)

### 9.3 Removing and Replacing E5-APP-B Cards

This section gives procedures on removing and replacing the E5-APP-B card and drive modules.

#### 9.3.1 Removing an E5-APP-B Card

##### Procedure - Remove E5-APP-B card



##### Note:

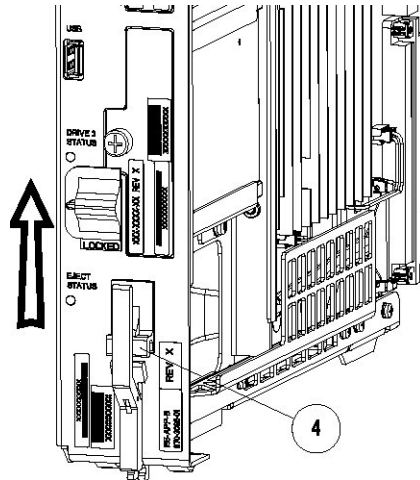
The `shutdown`, `init 6` or `halt` commands will not shut down the E5-APP-B card.

1. On the E5-APP-B card, slide the Ejector switch (4) up to the UNLOCKED position (see [Figure 9-1](#)).

**⚠ Caution:**

When the Ejector switch goes from locked to unlocked and the E5-APP-B card is in service, the card will halt.

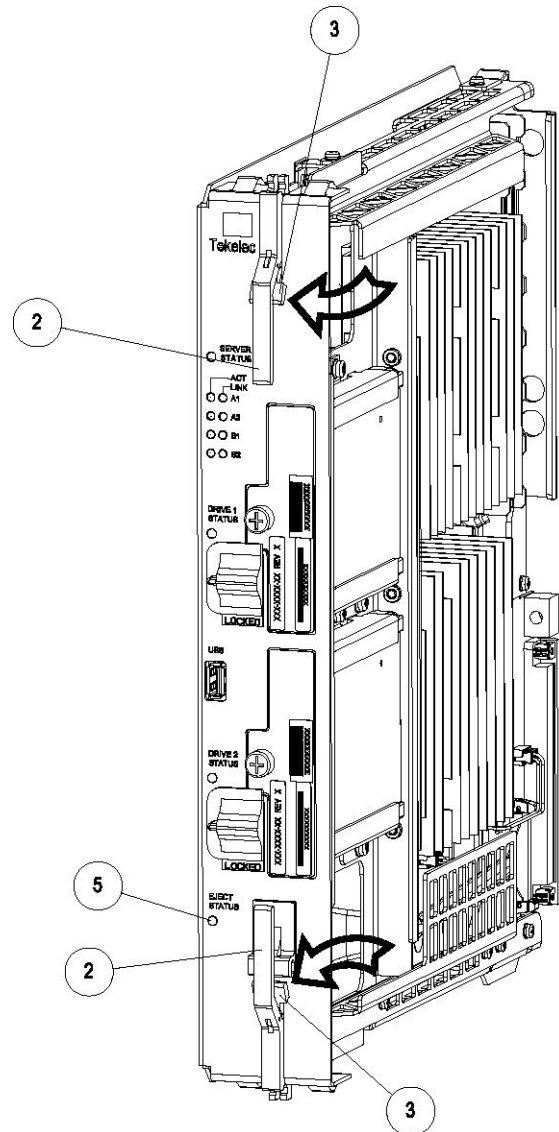
**Figure 9-1 E5-APP-B Card Eject Hardware Switch, UNLOCKED**



2. WAIT for the E5-APP-B Eject Status LED to go from blinking red to a steady red.  
When the Eject Status LED is steady red, the E5-APP-B card is in shutdown state.  
If the Ejector switch is put into the LOCKED position now, the E5-APP-B card will reboot.
3. Grasp the upper and lower card Inject/Eject (I/E) lever release (3) just underneath the I/E lever, and press it to meet the I/E lever. This is the mechanical interlock for the card.

See [Figure 9-2](#)

Figure 9-2 E5-APP-B Card UNLOCKED



4. While holding the I/E interlock and lever, pull the levers (2) away from the shelf until they are parallel to the floor.
5. Remove the E5-APP-B card from the EAGLE shelf.

## 9.3.2 Replacing an E5-APP-B Card

### Procedure - Replace E5-APP-B card

1. While holding the I/E interlock and lever, pull the levers (2) away from the card until they are parallel to the floor.

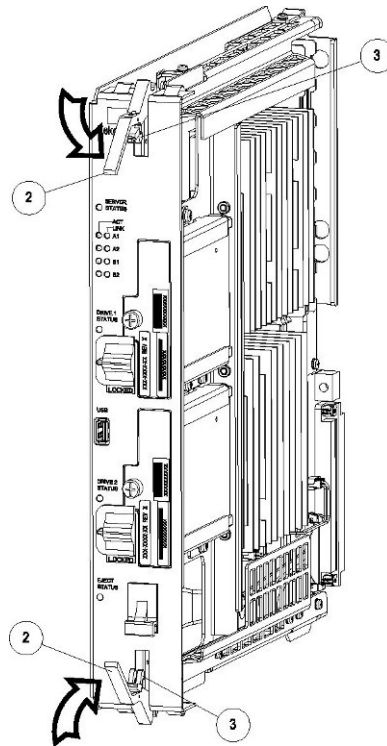
Figure 9-3 illustrates the angle of the interlocks and levers just before inserting E5-APP-B Card into the EAGLE shelf.

**Figure 9-3 E5-APP-B Card UNLOCKED**



2. Insert the E5-APP-B card into the EAGLE shelf.  
Carefully align the edges of the card with the top and bottom card guides. Then, push the card along the length of the card guides until the rear connectors on the card engage the mating connectors on the target shelf backplane.
3. Push in the top and bottom inject/eject clamps (see [Figure 9-4](#)).

**Figure 9-4 E5-APP-B Card Inject Levers**



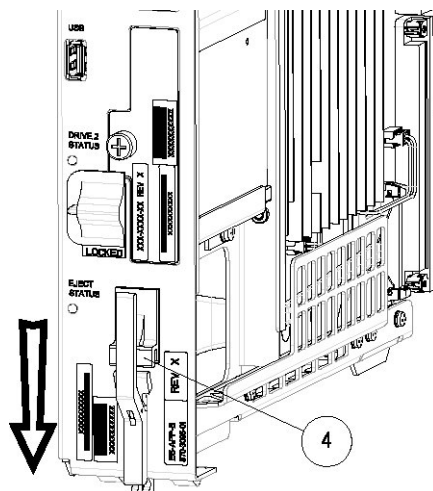
This locks the card in place and ensures a strong connection with the pins on the target shelf backplane.

4. Slide the E5-APP-B Ejector switch (4) down to the LOCKED position (see [Figure 9-5](#)).

**Note:**

When the Ejector switch goes from UNLOCKED to LOCKED, the E5-APP-B Eject Status LED blinks red as the E5-MASP card goes online.

**Figure 9-5 E5-APP-B Card Inject Hardware Switch, LOCKED**



5. WAIT for the E5-APP-B Eject Status LED to go from blinking red to off.

## 9.4 Removing and Replacing a Drive Module Assembly

E5-APP-B cards are designed for high-availability environments, but even with the advanced reliability of the E5-APP-B card, hardware failures can occur. The E5-APP-B card is designed for easy maintenance when drive module replacement is needed. Since there are two drive modules configured with RAID in an E5-APP-B card, if one becomes corrupt the other drive continues to function. No down time is required to replace a drive module as this procedure can be used on a setup that is up and running.

### Procedure - Remove and Replace a Drive Module Assembly

1. Use the `smartd` command to verify the drive module names.

```
ls /var/TKLC/log/smartd
lock log.sda log.sdb sda sdb
```

In this example, the drive module names are `sda` and `sdb`.

2. Use the `mdstat` command to determine whether a drive module is corrupt:

```
cat /proc/mdstat
```

- On a healthy system where both drive modules (`sda` and `sdb`) are functioning properly, the `mdstat` output will include both drive modules:

```
cat /proc/mdstat
Personalities : [raid1]
md1 : active raid1 sdb2[1] sda2[0]
 262080 blocks super 1.0 [2/2] [UU]

md2 : active raid1 sda1[0] sdb1[1]
 292631552 blocks super 1.1 [2/2] [UU]
 bitmap: 2/3 pages [8KB], 65536KB chunk

unused devices: <none>
```

- On a system where one of the drive modules is healthy and one is corrupt, only the healthy drive module is displayed:

```
cat /proc/mdstat
Personalities : [raid1]
md1 : active raid1 sdb2[1]
 262080 blocks super 1.0 [2/1] [_U]

md2 : active raid1 sdb1[1]
 292631552 blocks super 1.1 [2/1] [_U]
 bitmap: 2/3 pages [8KB], 65536KB chunk

unused devices: <none>
```

In this example, the `mdstat` output shows only `sdb`, which indicates that `sda` is corrupt.



3. Log in as root and run the `failDisk` command to mark the appropriate drive module to be replaced.

```
/usr/TKLC/plat/sbin/failDisk <disk to be removed>
```

For example:

```
/usr/TKLC/plat/sbin/failDisk /dev/sda
```

4. After `failDisk` runs successfully, remove the drive module assembly.

See [Removing a Drive Module Assembly](#).

5. Insert the new drive module assembly.

See [Replacing a Drive Module Assembly](#).

## 9.4.1 Removing a Drive Module Assembly

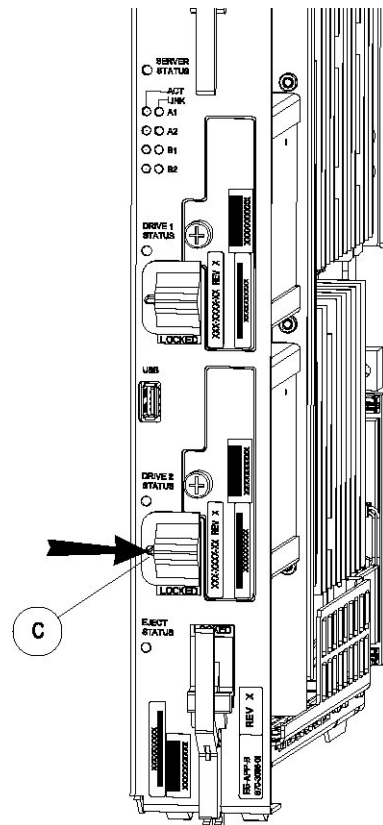
### Procedure - Remove Drive Module Assembly

1. Verify that the drive module is locked in position and in use.

The switch lock release (C) is in the LOCKED position and the Status LED on the E5-APP-B card is OFF.

Move the switch lock release (C) to the "released" position by pressing in the direction indicated. Refer to [Figure 9-6](#).

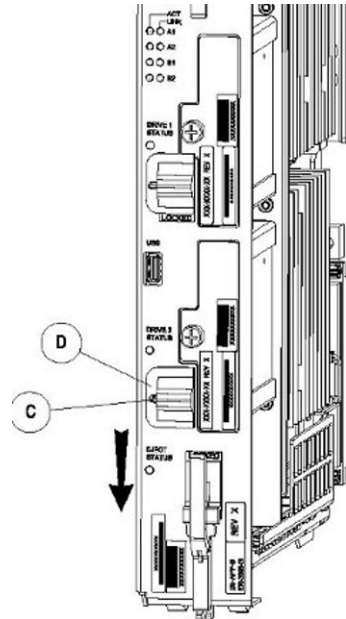
**Figure 9-6 Drive Module Released**



2. Move drive module locking switch (D) from the LOCKED to the unlocked position and wait for the LED (B) to indicate a steady red state. See [Figure 9-7](#) and [Figure 9-8](#), respectively.

When drive module locking switch (D) is transitioned from locked to unlocked, the LED will flash red to indicate the drive is unlocked and in process of shutting down.

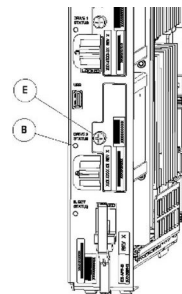
**Figure 9-7 Drive Module UNLOCKED**



**Caution:**

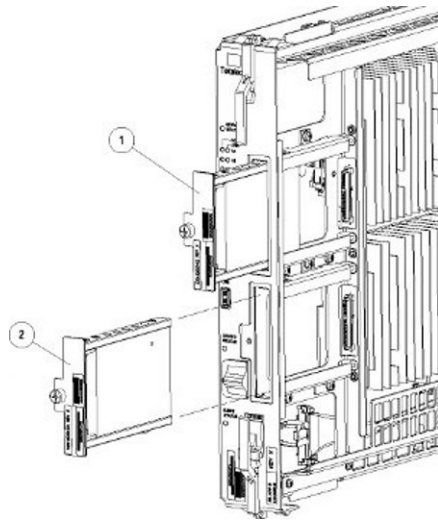
Removal of the drive prior to the LED indicating steady red could result in drive corruption.

**Figure 9-8 Drive Module Status**



3. When the LED indicates a steady red, the drive module can be safely removed.
4. Loosen the drive module screw (E) (see [Figure 9-8](#)).
5. Grasp the screw (E) and pull the drive out slowly until it is free from the card (see [Figure 9-9](#)).

**Figure 9-9 Drive Module Removal**

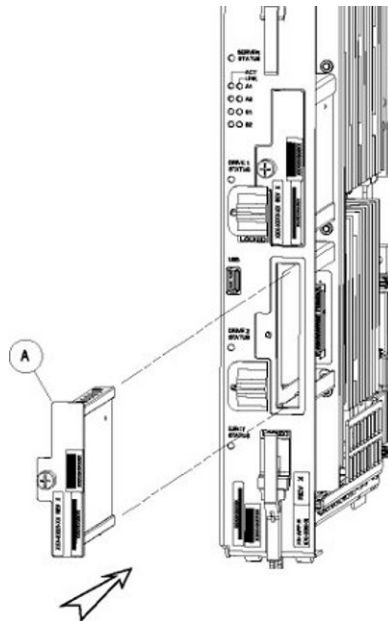


## 9.4.2 Replacing a Drive Module Assembly

### Procedure - Replace Drive Module Assembly

1. Slide a new drive(s) module into the drive slot on the card (see [Figure 9-10](#)).

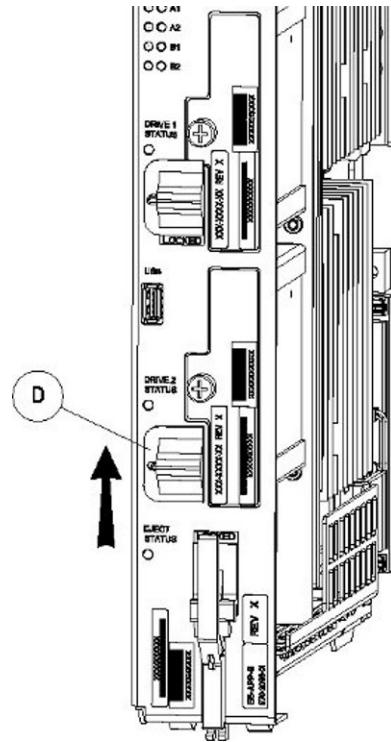
**Figure 9-10 Drive Module Replacement**



2. Gently push the drive (A) in slowly until it is properly seated.
3. Tighten the mounting screw until the Drive Status LED is in a steady red state ((B), from [Figure 9-8](#)).
4. Move the drive module locking switch (D) from the unlocked to the LOCKED position.

When drive module locking switch (D) is transitioned from unlocked to locked, the LED will flash red to indicate the drive is locked and in process of coming online (see [Figure 9-11](#)).

**Figure 9-11 Drive Module Locked**



5. When the LED turns off, log in as `admusrroot` and run the `cpDiskCfg` command to copy the partition table from the good drive module to the new drive module.

```
$ sudo /usr/TKLC/plat/sbin/cpDiskCfg <source disk> <destination disk>
```

```
/usr/TKLC/plat/sbin/cpDiskCfg <source disk> <destination disk>
```

For example:

```
$ sudo /usr/TKLC/plat/sbin/cpDiskCfg /dev/sdb /dev/sda
```

```
/usr/TKLC/plat/sbin/cpDiskCfg /dev/sdb /dev/sda
```

6. After successfully copying the partition table, use the `mdRepair` command to replicate the data from the good drive module to the new drive module.

```
$ sudo /usr/TKLC/plat/sbin/mdRepair
```

```
/usr/TKLC/plat/sbin/mdRepair
```

This step takes 45 to 90 minutes and runs in the background without impacting functionality.

**Sample output of the command:**

```
[admusr@recife-b ~]$ sudo /usr/TKLC/plat/sbin/mdRepair
SCSI device 'sdb' is not currently online
probing for 'sdb' on SCSI 1:0:0:0
giving SCSI subsystem some time to discover newly-found disks
Adding device /dev/sdb1 to md group md1...
md resync in progress, sleeping 30 seconds...
md1 is 0.0% percent done...
```

This script MUST be allowed to run to completion. Do not exit.

bgRe-installing master boot loader(s)

```
Adding device /dev/sdb2 to md group md3...
Adding device /dev/sdb9 to md group md5...
Adding device /dev/sdb7 to md group md4...
Adding device /dev/sdb6 to md group md7...
Adding device /dev/sdb8 to md group md6...
Adding device /dev/sdb3 to md group md2...
Adding device /dev/sdb5 to md group md8...
md resync in progress, sleeping 30 seconds...
md3 is 3.6% percent done...
```

This script MUST be allowed to run to completion. Do not exit.

```
md resync in progress, sleeping 30 seconds...
md5 is 27.8% percent done...
```

This script MUST be allowed to run to completion. Do not exit.

```
md resync in progress, sleeping 30 seconds...
md4 is 8.9% percent done...
```

This script MUST be allowed to run to completion. Do not exit.

```
md resync in progress, sleeping 30 seconds...
md4 is 62.5% percent done...
```

This script MUST be allowed to run to completion. Do not exit.

```
md resync in progress, sleeping 30 seconds...
md7 is 14.7% percent done...
```

This script MUST be allowed to run to completion. Do not exit.

```
md resync in progress, sleeping 30 seconds...
md7 is 68.3% percent done...
```

This script MUST be allowed to run to completion. Do not exit.

```
md resync in progress, sleeping 30 seconds...
md8 is 0.3% percent done...
```

This script MUST be allowed to run to completion. Do not exit.

```
md resync in progress, sleeping 30 seconds...
md8 is 1.1% percent done...
```

This script MUST be allowed to run to completion. Do not exit.

```
md resync in progress, sleeping 30 seconds...
md8 is 2.0% percent done...
```

**7. Use the `cat /proc/mdstat` command to confirm whether RAID repairs are successful.**

After the RAID is repaired successfully, output showing both drive modules is displayed:

```
Personalities : [raid1]
md1 : active raid1 sdb2[1] sda2[0]
 262080 blocks super 1.0 [2/2] [UU]

md2 : active raid1 sda1[0] sdb1[1]
 468447232 blocks super 1.1 [2/2] [UU]
 bitmap: 1/4 pages [4KB], 65536KB chunk

unused devices: <none>
```

```
Personalities : [raid1]
md2 : active raid1 sda2[0] sdb2[1]
 26198016 blocks super 1.1 [2/2] [UU]
 bitmap: 1/1 pages [4KB], 65536KB chunk

md1 : active raid1 sda3[0] sdb3[1]
 262080 blocks super 1.0 [2/2] [UU]

md3 : active raid1 sdb1[1] sda1[0]
 442224640 blocks super 1.1 [2/2] [UU]
 bitmap: 1/4 pages [4KB], 65536KB chunk

unused devices: <none>
```

Output of `cat /proc/mdstat` prior to re-mirroring:

```
[admusr@recife-b ~]$ sudo cat /proc/mdstat
Personalities : [raid1]
md1 : active raid1 sda1[0]
 264960 blocks [2/1] [U_]

md3 : active raid1 sda2[0]
 2048192 blocks [2/1] [U_]

md8 : active raid1 sda5[0]
 270389888 blocks [2/1] [U_]

md7 : active raid1 sda6[0]
 4192832 blocks [2/1] [U_]

md4 : active raid1 sda7[0]
```

```

4192832 blocks [2/1] [U_]

md6 : active raid1 sda8[0]
 1052160 blocks [2/1] [U_]

md5 : active raid1 sda9[0]
 1052160 blocks [2/1] [U_]

md2 : active raid1 sda3[0]
 1052160 blocks [2/1] [U_]

unused devices: <none>

```

#### Output of cat /proc/mdstat during re-mirroring process:

```

[admusr@recife-b ~]$ sudo cat /proc/mdstat
Personalities : [raid1]
md1 : active raid1 sdb1[1] sda1[0]
 264960 blocks [2/2] [UU]

md3 : active raid1 sdb2[1] sda2[0]
 2048192 blocks [2/2] [UU]

md8 : active raid1 sdb5[2] sda5[0]
 270389888 blocks [2/1] [U_]
 [====>.....] recovery = 26.9% (72955264/270389888)
 finish=43.8min speed=75000K/sec

md7 : active raid1 sdb6[1] sda6[0]
 4192832 blocks [2/2] [UU]

md4 : active raid1 sdb7[1] sda7[0]
 4192832 blocks [2/2] [UU]

md6 : active raid1 sdb8[1] sda8[0]
 1052160 blocks [2/2] [UU]

md5 : active raid1 sdb9[1] sda9[0]
 1052160 blocks [2/2] [UU]

md2 : active raid1 sdb3[2] sda3[0]
 1052160 blocks [2/1] [U_]
 resync=DELAYED

```

#### Output of cat /proc/mdstat upon successful completion of re-mirror:

```

[admusr@recife-b ~]$ sudo cat /proc/mdstat
Personalities : [raid1]
md1 : active raid1 sdb1[1] sda1[0]
 264960 blocks [2/2] [UU]

md3 : active raid1 sdb2[1] sda2[0]
 2048192 blocks [2/2] [UU]

```

```
md8 : active raid1 sdb5[1] sda5[0]
 270389888 blocks [2/2] [UU]

md7 : active raid1 sdb6[1] sda6[0]
 4192832 blocks [2/2] [UU]

md4 : active raid1 sdb7[1] sda7[0]
 4192832 blocks [2/2] [UU]

md6 : active raid1 sdb8[1] sda8[0]
 1052160 blocks [2/2] [UU]

md5 : active raid1 sdb9[1] sda9[0]
 1052160 blocks [2/2] [UU]

md2 : active raid1 sdb3[1] sda3[0]
 1052160 blocks [2/2] [UU]

unused devices: <none>
```



# A

## Commands

This appendix shows you the syntax and usage of **LSMS** commands

### A.1 Introduction

You access most **LSMS** database administration and configuration functions through the **LSMS** graphical user interface (**GUI**). For more information about using the **GUI** for these functions, refer to *Database Administrator's Guide*, *LNP Database Synchronization User's Guide*, and *Configuration Guide*.

In addition, you can use commands to manage some **LSMS** functions. This appendix shows you the syntax and usage of **LSMS** and third-party application commands, entered at a command-line prompt, that control **LSMS** or third-party applications.

#### Overview of LSMS Application Commands Entered at the Command-Line Prompt

[Table A-1](#) summarizes the **LSMS** application and third-party application commands that are entered at the command-line prompt. These commands are described in this appendix. For information about the notation used in the command descriptions, see [Entering LSMS and Third-Party Application Commands](#).

**Table A-1 LSMS Application Functions and Third-Party Commands Available at the command-line Prompt**

| Function                                                                                  | Command                       |
|-------------------------------------------------------------------------------------------|-------------------------------|
| Display, add, or delete remote locations and scheduled transfers                          | <a href="#">autoxfercfg</a>   |
| Select the last change time for the specified region                                      | <a href="#">chglct</a>        |
| Verify that <b>EMS</b> Routing is set up properly                                         | <a href="#">chkfilter</a>     |
| Control an <b>eagleagent</b> process                                                      | <a href="#">eagle</a>         |
| Import data from <b>NPAC</b> files into <b>LSMS</b> databases                             | <a href="#">import</a>        |
| Load, delete, or display keys for <b>NPAC</b> associations                                | <a href="#">keyutil</a>       |
| Control a regional <b>npacagent</b>                                                       | <a href="#">lsms</a>          |
| Obtain information about a database                                                       | <a href="#">lsmsdb</a>        |
| Start, stop, or show status of the <b>SNMP</b> Agent process                              | <a href="#">lsmsSNMP</a>      |
| Control the Surveillance process                                                          | <a href="#">lsmsurv</a>       |
| Perform mass update of <b>SPID</b> for <b>LRN</b> , <b>NPA-NXX</b> , and <b>NPA-NXX-X</b> | <a href="#">massupdate</a>    |
| Print measurement pegs to the display                                                     | <a href="#">measdump</a>      |
| Create or remove a regional <b>NPAC</b> database                                          | <a href="#">npac_db_setup</a> |
| Import specific files into a regional database                                            | <a href="#">npacimport</a>    |
| Generate a report about one or more databases                                             | <a href="#">report</a>        |

**Table A-1 (Cont.) LSMS Application Functions and Third-Party Commands Available at the command-line Prompt**

| Function                                                                        | Command                         |
|---------------------------------------------------------------------------------|---------------------------------|
| Create or remove the resynchronization database                                 | <a href="#">resync_db_setup</a> |
| Control the Service Assurance agent                                             | <a href="#">SAagent</a>         |
| Associate usernames with <b>SPIDs</b>                                           | <a href="#">spidsec</a>         |
| Control the Local Services Manager and the Local Data Manager processes         | <a href="#">sup</a>             |
| Create or remove the Supported database                                         | <a href="#">sup_db_setup</a>    |
| Use to send a customer-defined notification                                     | <a href="#">survNotify</a>      |
| Detect, diagnose, or display a summary of the overall health of the <b>LSMS</b> | <a href="#">syscheck</a>        |

## A.2 Entering LSMS and Third-Party Application Commands

This appendix describes **LSMS** and certain third-party application commands used to manage the **LSMS**. Third-party commands identify their software source. All other commands in this appendix are **LSMS** commands.

All commands in this appendix are case-sensitive and are entered at the command-line prompt. After entering a command, you must press the Enter key. When the command has executed, you can enter another command.

### Notation

This appendix uses the following syntax notational conventions for commands entered at the command-line prompt:

- *Keywords* - identify the principal action to be performed by the system.
- *Permission* - identifies the group to which the user must belong to execute the command, or for certain commands, whether the user must be logged in with a particular user name. The possible groups are `lsms` as primary group, or secondary groups `lsmsadm`, `lsmsuser`, `lsmsuext`, `lsmview`, and `lsmsall` (all users defined to be a member of one of these secondary groups should have `lsms` defined as their primary group). For more information about primary and secondary group definitions, see [Managing User Accounts](#).
- *Restrictions* - note restrictions or limitations applying to the use of the command.
- *Syntax* - identifies the command's keywords, options (if any), parameters, and their proper order. In syntax, the following symbols are used:
  - `<xxx>` indicates a variable
  - `[xxx]` indicates a parameter or option that is optional
  - `{xxx|yyy}` indicates a mandatory parameter; you must specify one of the values shown (in this case `xxx` or `yyy`)
- *Options* - tell the operating system how to perform a command. Options are also known as switches.
- *Parameters* - further define the command's operation.
- *Sample Output* - is an example of typical output produced by the command.

- *Environment* - identifies any special environment variables or condition that must exist on the system for the process to execute. All commands use only default environment variables, with the exception of `start_mgui`, which requires setting the **\$DISPLAY** environment variable.
- *Response Notes* - identifies any pertinent command performance information.
- *Related Commands* - identifies other commands or programs related to this command.
- *Files* - identifies, describes, and provides the location of the configuration files required for proper execution of this command.

### Command Example

The following is an example of an **LSMS** command entry:

```
$ $LSMS_DIR/resync_db_setup create
```

The environment variable is `$LSMS_DIR`, the directory containing the **LSMS** software. It is followed by the keyword `resync_db_setup` (command for creating or removing the resynchronization database). A single parameter is given for this command, `create` (indicates the resynchronization database is to be created). This command has no options.

## A.2.1 autoxfercfg

### Automatic File Transfers

Displays, adds, and deletes remote locations and scheduled transfers.

### Keyword

```
autoxfercfg
```

### Permission

The user must be defined as a member of the secondary group `lsmsadm`.

### Syntax

```
$LSMS_DIR/autoxfercfg [-h]
```

### Options

None.

### Parameters

None.

### Sample Output

Select one of the following menu options:

- 1) Display valid remote locations
- 2) Add new remote location
- 3) Remove remote location
- 4) Display all scheduled transfers
- 5) Add new scheduled transfer

- 6) Remove scheduled transfer
- 7) Exit

For more information about using this menu, see one of the following:

- [“Displaying Remote Locations Used for Automatic File Transfers”](#)
- [“Adding a New Remote Location for Automatic File Transfers”](#)
- [“Deleting a Remote Location for Automatic File Transfers”](#)
- [“Displaying Previously Scheduled Automatic File Transfers”](#)
- [“Scheduling an Automatic File Transfer”](#)
- [“Removing a Scheduled Automatic File Transfer”](#)



### Caution:

The `.netrc` file (see [“Files”](#)) contains the `ftp` account login information and is readable by root.

## Possible Errors

**Table A-2 Error Messages: autoxfercfg**

| Exit Code | Message                                                                                                             | Cause                                                                              | Suggested Recovery                                                     |
|-----------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| 1         | Feature not enabled                                                                                                 | The Automatic File Transfer feature is not installed.                              | Contact Oracle to schedule installation and activation of the feature. |
| 2         | Only user 'lsmsadm' can run this program                                                                            | The user that tried to run this program was not the user <code>lsmsadm</code> .    | Change user to <code>lsmsadm</code> .                                  |
| 3         | Configuration utility already running                                                                               | The <code>autoxfercfg</code> command has already been entered, but not yet exited. | No action necessary.                                                   |
| 4         | Unable to open <code>&lt;home&gt;/.netrc</code> (where <code>&lt;home&gt;</code> is the home directory of the user) | The file permissions for <code>\$HOME/.netrc</code> are not set correctly.         | Change permissions on the <code>\$HOME/.netrc</code> file.             |

## Files

The following files associated with the `autoxfercfg` command.

**Table A-3 Files: autoxfercfg**

| Filename     | Type                            | Location              |
|--------------|---------------------------------|-----------------------|
| .netrc       | Autologin resource file for ftp | \$HOME                |
| crontab      | List of scheduled cron jobs     | \$HOME                |
| autoxfer.cfg | Configuration file              | /usr/TKLC/lrms/config |

## A.2.2 chglct

### Change Last Change Time

Manually sets the Last Change Time (**LCT**) for the database belonging to the specified region.

In each regional database, the **LSMS** updates the **LCT** when the **LSMS** receives transactions from that **NPAC**. When the **LSMS** automatically recovers from a temporary loss of association with an **NPAC**, it uses the **LCT** to determine the time range for which to request that the **NPAC** resend transactions.

Use this command to manually set the **LCT** when performing a bulk download of files from the **NPAC** (see [“NPAC-LSMS Download Procedure”](#), 32

### Keyword

chglct

### Permission

The user must be logged in with the user name `lrmsadm`.

### Syntax

```
$LSMS_TOOLS_DIR/chglct -h -r <region> [-d|-s <YYYYMMDDhhmmss>]
```

### Options

**-h**

Displays help information

**-r <region>**

Display or set the **LCT** in Greenwich Mean Time (**GMT**) for the region specified by *<region>*. Possible values for *<region>* are:

Canada  
Midwest

MidAtlantic  
Southeast  
Southwest  
Northeast  
Western  
WestCoast

#### **-d**

Display the current value of the **LCT** (in **GMT**) value for the specified region. The value has 14 characters in the form **YYYYMMDDhhmmss** which has the format shown in [Table A-4](#).

#### **-s <YYYYMMDDhhmmss>**

Set the value of the last change timestamp (in **GMT**) value for the specified region to the value indicated by the specified character string, which has 14 characters in the form **YYYYMMDDhhmmss**.

**Table A-4 Time Value for chglct**

| Characters  | Meaning | Range           |
|-------------|---------|-----------------|
| <b>YYYY</b> | Year    | Any four digits |
| <b>MM</b>   | Month   | 01–12           |
| <b>DD</b>   | Day     | 01–31           |
| hh          | Hour    | 00–23           |
| mm          | Minute  | 00–59           |
| ss          | Second  | 00–59           |

#### **Sample Output**

Display the last changed timestamp for the Midwest region

```
$ chglct -d -r Midwest
```

```
Midwest last changed timestamp: 20011107113017
Local Time: 11/7/2001 6:30:17
GMT Time: 11/7/2001 11:30:17
```

\$

#### **Related Commands**

None.

#### **Response Notes**

None.

## Possible Errors

**Table A-5 Error Messages: chglct**

| Exit Code | Error Message | Cause                                                                                 | Suggested Recovery                                        |
|-----------|---------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------|
| -1        | Syntax error  | User entered command with incorrect syntax.                                           | Try the command again with correct syntax.                |
| 1         | DbError       | Database exception.                                                                   | Contact My Oracle Support.                                |
| 2         | InvalidUser   | A user with a username other than <code>lsmsadm</code> attempted to run this command. | Log in as <code>lsmsadm</code> and try the command again. |
| 3         | UnknownError  | Contact Oracle.                                                                       | Contact My Oracle Support.                                |

## Files

None.

## A.2.3 chkfilter

### Check EMS Routing Filters

Run this command to verify that **EMS** Routing is set up properly. This command reviews all the telephone number (**TN**) and number pool block (**NPB**) transactions that were received from **NPACs** in the past 24 hours and determines whether any of these **TNs** and **NPBs** were not forwarded to any **EAGLE** node. If any are found, a file `$LSMS_DIR/./logs/trace/LsmsSubNotFwd.log.<MMDD>` (where `<MMDD>` indicates the month and day the `chkfilter` command was run) is created and those **TNs** and **NPBs** are stored in this file.

### Keyword

`chkfilter`

### Permission

The user must be logged in with the user name `lsmsadm`.

### Syntax

`$LSMS_TOOLS_DIR/chkfilter`

### Options

None.

### Sample Output

```
$ chkfilter
$
```

## Related Commands

None.

## Files

**Table A-6 Files: chkfilter**

| Filename                     | Type | Location                         |
|------------------------------|------|----------------------------------|
| LsmsSubNotFwd.log.<MMD<br>D> |      | \$LSMS_DIR/../../logs/<br>trace/ |

## Response Notes

None.

## Possible Errors

**Table A-7 Error Messages: chkfilter**

| Exit Code | Error Message | Cause                                                                                 | Suggested Recovery                                        |
|-----------|---------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------|
| -1        | Syntax error  | User entered command with incorrect syntax.                                           | Try the command again with correct syntax.                |
| 1         | DbError       | <b>Database</b> exception.                                                            | Contact My Oracle Support.                                |
| 2         | InvalidUser   | A user with a username other than <code>lsmsadm</code> attempted to run this command. | Log in as <code>lsmsadm</code> and try the command again. |
| 3         | EnvNotSet     | The <b>LSMS_DIR</b> env variable is not set.                                          | Verify the environment variables.                         |
| 4         | FileError     | Unable to open output file, check directory and permission                            | Contact My Oracle Support.                                |
| 5         | UnknownError  | Not known.                                                                            | Contact My Oracle Support.                                |

## A.2.4 eagle

### EAGLE Agent Control

Used to start, stop, or display status of an `eagleagent` process.

### Keyword

`eagle`



## Permission

The user must be logged in with the user name `lsmsadm`.

## Syntax

```
$LSMS_DIR/eagle <Action> <CLLI>
```

## Options

None.

## Parameters

### Action

The function to be performed on the `eagleagent` process. This mandatory parameter has the following values:

```
start
stop
status
```

### <CLLI>

**Common Language Location Identifier** for the network element associated with this `eagleagent` process. This parameter is required when `Action` is `start` or `stop`. When `Action` is `status`, this parameter is optional; if not specified, the status for all `eagleagent` processes is displayed.

## Sample Output

# Stop the EAGLE Agent for the network element whose **CLLI** is **STPM1**

```
$ $LSMS_DIR/eagle stop STPM1
```

```
eagle: Stopping...
```

```
eagle: eagleagent STPM1 stopped at Thu Mar 7 17:21:05 2002
```

# Verify that EAGLE Agent has stopped

```
$ $LSMS_DIR/eagle status STPM1
```

```
eagle: eagleagent STPM1 is not running.
```

# Restart the EAGLE Agent for the network element whose **CLLI** is **STPM1**

```
$ $LSMS_DIR/eagle start STPM1
```

```
eagle: Starting...
```

```
eagle: eagleagent STPM1 started at Thu Mar 7 17:17:36 2002
```

# Check the status of the EAGLE Agent for the network element whose **CLLI** is **STPM1**

```
$ $LSMS_DIR/eagle status STPM1
```

```
eagleagent:
```

```

 CLLI = STPM1
 Pid = 72
 State = NONE_ACTIVE
 Resync = NO_CONNECTION
 Connection A = DOWN
 Connection B = DOWN
 DCM connection = NONE
 EBDA = IDLE
 Debug logging = OFF
 Pending queue = 0 of 2000000 bytes (0%)
 Keepalive timestamp = Thu Mar 7 17:19:02 EST 2002
 Virtual memory = 14392 K bytes
 CPU usage = 1.1 %

```

#### # Check the status of all EAGLE Agents

```
$ $LSMS_DIR/eagle status
```

```

CLLI Pid State Resync Conn A Conn B DCM EBDA
Debug Queue Memory CPU Timestamp
STPM0 --- not running
STPM1 72 NONE_ACTIVE NO_CONNECTION DOWN DOWN NONE IDLE
OFF 0 % 14 M 0.4 % 17:19:25
STPM2 449 B_ACTIVE IN_PROGRESS DOWN ACTIVE NONE RUNNING
OFF 0 % 12 M 1.0 % 17:19:23
STPO3 20179 A_ACTIVE COMPLETE ACTIVE STANDBY OK IDLE
OFF 0 % 14 M 0.3 % 17:19:27

```

#### Related Commands

None.

#### Response Notes

None.

#### Files

None.

#### Possible Errors

**Table A-8 Exit Codes: eagle**

| Exit Code | Cause                              | Suggested Recovery                |
|-----------|------------------------------------|-----------------------------------|
| 1         | Incorrect syntax.                  | Correct the syntax.               |
| 2         | Invalid command for current state. | No action necessary.              |
| 3         | Error in environment.              | Verify the environment variables. |

**Table A-8 (Cont.) Exit Codes: eagle**

| Exit Code | Cause                    | Suggested Recovery         |
|-----------|--------------------------|----------------------------|
| 4         | Unable to create socket. | Contact My Oracle Support. |
| 5         | Unable to bind socket.   | Contact My Oracle Support. |
| 6         | Fatal application error. | Contact My Oracle Support. |
| 7         | Operation failed.        | Contact My Oracle Support. |

This command is usually run by scripts; scripts should search for exit codes. When the command is run from the command line, the output indicates suggested recovery.

## A.2.5 hastatus

### Display LSMS HA Status

Allows user to display the High Availability status of the server on which the command is run.

### Keyword

`hastatus`

### Permission

The user can be logged in as any user.

### Syntax

`/usr/TKLC/plat/bin/hastatus`

### Required Flags

None.

### Sample Output

```
$ hastatus
```

```
ACTIVE
```

### Related Commands

None.

### Response Notes

None.

### Possible Errors

**Table A-9 Error Messages: hastatus**

| Exit Code | Error Message | Cause | Suggested Recovery |
|-----------|---------------|-------|--------------------|
| 0         | Success       | n/a   | n/a                |

**Table A-9 (Cont.) Error Messages: hastatus**

| Exit Code | Error Message  | Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Suggested Recovery                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1         | Failure        | Varies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Contact My Oracle Support.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2         | Query No Match | <p>Querying the status of a component, based on a condition, did not result in a match. Following are the most common causes, which are dependent upon the particular query.</p> <ul style="list-style-type: none"> <li>• If the query was returned while querying for keepalive status, keepalive may be unconfigured or misconfigured</li> <li>• If the query was returned while querying for ping status, there may be a network problem</li> <li>• If the query was returned while querying for node status, there may be a problem with keepalive</li> <li>• All others</li> </ul> | <p>Customer or field engineers should:</p> <ul style="list-style-type: none"> <li>– Verify network configuration and network cabling</li> <li>– Verify serial configuration and cabling if serial keepalive is configured</li> <li>– If the problem persists, contact My Oracle Support.</li> </ul> <p>Customer or field engineers should:</p> <ul style="list-style-type: none"> <li>– Verify the network configuration and connection, especially the uplink to the customer's network</li> <li>– Check keepalive status</li> <li>– If the problem persists, contact My Oracle Support.</li> </ul> <p>Customer or field engineers should:</p> <ul style="list-style-type: none"> <li>– Check keepalive status</li> <li>– If the problem persists, contact My Oracle Support.</li> </ul> <p>Contact My Oracle Support.</p> |

Table A-9 (Cont.) Error Messages: hastatus

| Exit Code | Error Message | Cause     | Suggested Recovery         |
|-----------|---------------|-----------|----------------------------|
| 6         | UnknownError  | Not known | Contact My Oracle Support. |

## A.2.6 import

### Upload to MySQL Database

Imports data from **NPAC** files into **LSMS** databases. This command performs all parameter checking, and validates or creates the **NPAC** directory if required.



#### Note:

Do not run the `import` command while any of the following processes are also running: backups, starting a standby node (to change its state from **UNINITIALIZED** "INHIBITED" to **STANDBY**), running the `lsmsdb quickaudit` command, and creating query server snapshots, all of which use temporary storage space. If you try to run the `import` command while any of these processes are running, you may not have enough disk space to complete the process. Since backups can be run automatically, perform the procedure described in ["Checking for Running Backups"](#) to ensure that no backups are running.

### Keyword

`import`

### Permission

The user must be defined as a member of the primary group `lsms`.

### Syntax

```
$LSMS_DIR/import [-c] [-o [-d <dir>]] <region> [<filename>...]
```

Provided the `import` command is prefaced by the `$LSMS_DIR` environment variable, it can be performed from any directory location.

### Options

**-c**

If an error occurs, continue with the next record in the file. Errors are recorded in a file named `<filename>_FAILED`, where `<filename>` has the same value as was entered in the command.

**-o**

Generate a Response file for **SV** and **NPB** imports.

**-d <dir>**

Put the Response file(s) in the specified directory (defaults to the same directory as each **SV**/**NPB** import file).

## Parameters

### <region>

Name of the **NPAC** region: Midwest, MidAtlantic, Northeast, Southeast, Southwest, Western, WestCoast, Canada. This is a required parameter.

### <filename>

The name of the **NPAC** downloadfile in `npacftp/<region>`. This is an optional parameter. If you do not specify a <filename>, a list displays that includes all the valid import files from the `npacftp/<region>` directory for the **NPAC** region specified (the region is a required parameter).



#### Note:

Filenames must adhere to the following formats:

```
LRN.<create>.<start>.<end> NPANXX.<create>.<start>.<end>
NPANXXX.<create>.<start>.<end> SPID.<create>
<npanxx>-<npanxx>.<create>.<start>.<end>
<npanxxx>-<npanxxx>.<create>.<start>.<end>
```

Where:

<create> is the file creation timestamp: <DD-MM-YYYYhhmmss>

<start> is the start of the time-range: <DD-MM-YYYYhhmmss>

<end> is the end of the time-range: <DD-MM-YYYYhhmmss>



#### Note:

For Active (not time-range) files,

<start> is 00-00-0000000000 and <end> is 99-99-9999999999



#### Note:

**SPID** files are always Active.



#### Note:

Active files with filenames in the old format, with only a creation timestamp, are still supported.

### Example 1:

**<npnxxx>-<npnxxx>.<create>.<start>.<end>:**

303123-303125.02-11-1998133022.12-10-1998080000.13-10-1998133022

### Example 2:

**LRN.<create>.<start>.<end> [Active (not time-range) file]:**

LRN.02-10-2001102201.00-00-0000000000.99-99-9999999999

### Sample Output

```
NPAC FTP directory: /var/TKLC/lsms/free/data/npacftp/Midwest
The following NPAC download file(s) are available for import:
 LRN.11-07-2001145342 NPANXXX.11-07-2001145342
 NPANXXX.11-07-2001145342 SPID.11-07-2001145342
 000000-999999.11-07-2001145342 0000000-9999999.11-07-2001145342
Import LRN.11-07-2001145342 (Yes/No/All/Quit)?all
The following NPAC download files have been chosen to be imported:
 SPID.11-07-2001145342 NPANXXX.11-07-2001145342
 NPANXX.11-07-2001145342 LRN.11-07-2001145342
 000000-999999.11-07-2001145342 0000000-9999999.11-07-2001145342
Do you want to continue (Yes/No)?yes
Beginning Delete Process for SPID.11-07-2001145342
Delete Process Completed for SPID.11-07-2001145342
Beginning Download Process for SPID.11-07-2001145342
1000 ServiceProvNetwork instance updates in MidwestDB
2000 ServiceProvNetwork instance updates in MidwestDB
2351 ServiceProvNetwork instance updates in MidwestDB
Import completed successfully.
Download Process Completed for SPID.11-07-2001145342
Beginning Delete Process for NPANXXX.11-07-2001145342
Delete Process Completed for NPANXXX.11-07-2001145342
Beginning Download Process for NPANXXX.11-07-2001145342
1000 ServiceProvNPA_NXX_X instance updates in MidwestDB
2000 ServiceProvNPA_NXX_X instance updates in MidwestDB
3000 ServiceProvNPA_NXX_X instance updates in MidwestDB
4000 ServiceProvNPA_NXX_X instance updates in MidwestDB
30000 ServiceProvNPA_NXX_X instance updates in MidwestDB
30860 ServiceProvNPA_NXX_X instance updates in MidwestDB
Import completed successfully.
Download Process Completed for NPANXXX.11-07-2001145342
Beginning Delete Process for NPANXX.11-07-2001145342
Delete Process Completed for NPANXX.11-07-2001145342
Beginning Download Process for NPANXX.11-07-2001145342
90 ServiceProvNPA_NXX instance updates in MidwestDB
1090 ServiceProvNPA_NXX instance updates in MidwestDB
Import completed successfully.
Download Process Completed for NPANXX.11-07-2001145342
Beginning Delete Process for LRN.11-07-2001145342
Delete Process Completed for LRN.11-07-2001145342
```

```
Beginning Download Process for LRN.11-07-2001145342
1000 ServiceProvLRN instance updates in MidwestDB
2000 ServiceProvLRN instance updates in MidwestDB
3000 ServiceProvLRN instance updates in MidwestDB
4000 ServiceProvLRN instance updates in MidwestDB
4700 ServiceProvLRN instance updates in MidwestDB
5700 ServiceProvLRN instance updates in MidwestDB
Import completed successfully.
Download Process Completed for LRN.11-07-2001145342
Beginning Delete Process for 000000-999999.11-07-2001145342
All Subscription Version instances deleted from Midwest
Delete Process Completed for 000000-999999.11-07-2001145342
Beginning Download Process for 000000-999999.11-07-2001145342
1000 SubscriptionVersion instance updates in MidwestDB
2000 SubscriptionVersion instance updates in MidwestDB
3000 SubscriptionVersion instance updates in MidwestDB
4000 SubscriptionVersion instance updates in MidwestDB
4500 SubscriptionVersion instance updates in MidwestDB
Import completed successfully.
Download Process Completed for 000000-999999.11-07-2001145342
Beginning Delete Process for 0000000-9999999.11-07-2001145342
All Subscription Version instances deleted from Midwest
Delete Process Completed for 0000000-9999999.11-07-2001145342
Beginning Download Process for 0000000-9999999.11-07-2001145342
1000 NumberPoolBlock instance updates in MidwestDB
2000 NumberPoolBlock instance updates in MidwestDB
Import completed successfully.
Download Process Completed for 0000000-9999999.11-07-2001145342
Script completed.
```

## Files

[Table A-11](#) shows the files for the `import` command.

**Table A-10 Files: import**

| Filename          | Type                                                                                                                                         | Location                                  |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| <filename>        | Download file                                                                                                                                | /var/TKLC/lrms/free/data/npacftp/<region> |
| <filename>_FAILED | Error file, created if errors occur during import. If the <code>-c</code> option was not specified, the file will contain at most one entry. | /var/TKLC/lrms/free/data/npacftp/<region> |
| <filename>-<spid> | Response file                                                                                                                                | /var/TKLC/lrms/free/data/npacftp/<region> |



## Error Messages

**Table A-11 Error Messages: import**

| Exit Code | Message                                                                                                                                                                                                                                                                                                                                                                                | Cause                                                                  | Suggested Recovery                                             |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------|
| 7         | <ul style="list-style-type: none"> <li>Delete process failed for BulkLoadFile : retCode</li> <li>Delete process failed for BulkLoadFile : delete coredump from signal SigValue</li> </ul>                                                                                                                                                                                              | Delete utility failed                                                  | Contact My Oracle Support.                                     |
| 8         | <ul style="list-style-type: none"> <li>Download process failed for BulkLoadFile : retCode</li> <li>Download process failed for BulkLoadFile : dnld coredump from signal SigValue</li> </ul>                                                                                                                                                                                            | <b>DNLD</b> utility failed                                             | Contact My Oracle Support.                                     |
| 99        | <p>Insufficient arguments Usage: import &lt;region&gt; [&lt;filename&gt;...] where &lt;region&gt; is the name of the NPAC region database: Canada, Midwest, MidAtlantic, Northeast, Southeast, Southwest, Western, WestCoast &lt;filename&gt; name of the NPAC download file: SPID .dd-mm-yyyyhhmmss LRN .dd-mm-yyyyhhmmss NPANXX .dd-mm-yyyyhhmmss npanxx-npanxx.dd-mm-yyyyhhmmss</p> | Invalid number of parameters supplied                                  | Try the command again with correct syntax.                     |
| 1         | <p>Invalid NPAC Region. Usage: import &lt;region&gt; [&lt;filename&gt;...] where &lt;region&gt; is the name of the NPAC region: database: Canada, Midwest, MidAtlantic, Northeast, Southeast, Southwest, Western, WestCoast &lt;filename&gt; name of the NPAC download file: SPID.dd-mm-yyyyhhmmss LRN.dd-mm-yyyyhhmmss NPANXX.dd-mm-yyyyhhmmss npanxx-npanxx.dd-mm-yyyyhhmmss</p>     | Invalid <b>NPAC</b> region supplied                                    | Supply valid region name for command.                          |
| 2         | <p><b>LSMS_DIR</b> environment variable is not set/defined.</p>                                                                                                                                                                                                                                                                                                                        | <b>LSMS_DIR</b> environment variable is not set                        | Verify the environment variables or contact My Oracle Support. |
| 9         | <p>/var/TKLC/lsmis/free/data/npacftp/&lt;region&gt; does not contain any download files.</p>                                                                                                                                                                                                                                                                                           | <b>NPAC</b> directory for <region> does not contain any download files | No action necessary.                                           |

**Table A-11 (Cont.) Error Messages: import**

| Exit Code | Message                                                                                                                                                                                   | Cause                                                             | Suggested Recovery                                                                |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| 3         | /var/TKLC/lsmis/free/data/npacftp/<br><region> NPAC directory does not exist.                                                                                                             | NPAC FTP<br>directory for<br><region><br>cannot be located        | Contact My<br>Oracle Support.                                                     |
| 5         | The npacagent process is currently running for the<br><region> region. It must be stopped prior to importing by<br>executing the following command:<br><br>\$LSMS_DIR/lsmis stop <region> | The<br>npacagent<br>process is<br>running for<br>specified region | Stop the<br>npacagent<br>process for this<br>region and try the<br>command again. |

## A.2.7 keyutil

### Process Keys

Allows user to view security key status, load keys, or delete keys for **NPAC** associations.

### Keyword

keyutil

### Permission

The user must be logged in with the user name `lsmisadm`.

### Syntax

```
$LSMS_TOOLS_DIR/keyutil -r <region> -k {public|private} [-d] [-l
<filename>] [-x <listid>] [-s <listid>, <keyid>] [-y]
```

### Required Flags

#### -r <region>

Perform the function specified by another option for keys for the specified region, where <region> has one of the following values:

```
Canada
Midwest
MidAtlantic
Southeast
Southwest
Northeast
Western
WestCoast
```

#### -k {public|private}

Perform the function specified by another option for keys of either public type or private type.

One of the following options must be specified:

**-d**

Display all keys.

**-l <filename>**

Load keys from the specified <filename>.

**-x <listid>**

Delete keys in the specified list.

**-s <listid>, <keyid>**

Set the active key. All private keys for the specified region that occur in the specified list before the specified key are expired; all private keys for that region that occur in the specified list after the specified key are made valid.

**Optional flags:**

**-y**

Make changes without prompting.

**Sample Output**

```
$ keyutil -r Midwest -k public -l ../../TKLC.1.public.key
```

```
Customer ID: TKLC
```

```
List ID: 1
```

```
Ok to make changes? y
```

```
$
```

**Related Commands**

None.

**Response Notes**

None.

**Possible Errors**

**Table A-12 Error Messages: keyutil**

| Exit Code | Error Message | Cause                                          | Suggested Recovery                                                                                                                  |
|-----------|---------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| -1        | SyntaxError   | The command was entered with incorrect syntax. | Try the command again with correct syntax.                                                                                          |
| 1         | FileError     | The key file to be opened could not be found.  | Verify the file path. If necessary, correct the path and try the command again. If the problem persists, contact My Oracle Support. |

Table A-12 (Cont.) Error Messages: keyutil

| Exit Code | Error Message | Cause                                                                 | Suggested Recovery         |
|-----------|---------------|-----------------------------------------------------------------------|----------------------------|
| 2         | SaidNo        | User answered no when prompted for changes.                           | No action necessary.       |
| 3         | NoKeysFound   | User specified keys to delete, but those keys were not found.         | Contact My Oracle Support. |
| 4         | DbError       | <b>Database</b> exception occurred; contact Oracle.                   | Contact My Oracle Support. |
| 5         | InvalidUser   | A user who is not <code>lsmsadm</code> attempted to run this command. | Contact My Oracle Support. |
| 6         | UnknownError  | Not known.                                                            | Contact My Oracle Support. |

## A.2.8 lsms

### NPAC Agent Control

Lets you start, stop, or display status of an instance of the **NPAC** Agent for a particular region.

### Keyword

`lsms`

### Permission

The user must be logged in with the user name `lsmsadm`.

### Restrictions

Do not start an **NPAC** agent unless you have already created a regional database for it (see [“npac\\_db\\_setup”](#)).

### Syntax

```
$LSMS_DIR/lsms <Action> <Region>
```

### Options

None.

### Parameters

#### Action

Function to perform on `npacagent` process. This is a mandatory parameter with the following values:

```
start
stop
status
```

### Region

**NPAC** region associated with this `npacagent` process. This is a mandatory parameter with the following values:

- Canada
- Midwest
- MidAtlantic
- Southeast
- Southwest
- Northeast
- Western
- WestCoast

### Sample Output

```
Stop the NPAC Agent for the Canada NPAC
$ $LSMS_DIR/lsms stop Canada
Checking if npacagent is running....Yes.

Stopping npacagent....
OK.

npacagent stopped: Wed Nov 30 16:28:26 2005

Command complete.
$
Verify that NPAC Agent has terminated
$ $LSMS_DIR/lsms status Canada
Checking if npacagent is running. .. .No.
Command Complete.
Restart the NPAC Agent for the Canada NPAC
>
$ $LSMS_DIR/lsms start Canada
Checking if npacagent is already running....No

Starting npacagent....

Verifying....OK.

npacagent started: Wed Nov 30 16:29:45 2005

Command complete.
```

## Possible Errors

**Table A-13 Error Messages: lsms**

| Exit Code | Message                                                                       | Cause                                                                                                                             | Suggested Recovery                                                                                             |
|-----------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| 1         | Checking if npacagent is already running....Yes. npacagent is already running | Operator tried to start npacagent when it was already running                                                                     | No action necessary.                                                                                           |
| 1         | Checking if npacagent is running....No. npacagent is not running.             | Operator tried to stop npacagent when it was already stopped                                                                      | No action necessary.                                                                                           |
| 3         | lsms: bind: <i>errornumber</i>                                                | Attempt to bind <b>UDP</b> socket failed. <i>errornumber</i> is the error returned by bind.                                       | Contact My Oracle Support.                                                                                     |
| 3         | lsms: exec: <i>errornumber</i>                                                | Attempt to exec npacagent process failed. <i>errornumber</i> is the error returned by exec.                                       | Contact My Oracle Support.                                                                                     |
| 1         | lsms: Failed to start npacagent                                               | Execution of npacagent failed                                                                                                     | Contact My Oracle Support.                                                                                     |
| 1         | lsms: Failed to stop npacagent                                                | Attempt to stop npacagent failed                                                                                                  | Contact My Oracle Support.                                                                                     |
| 2         | lsms:LSMS_DIR is not defined                                                  | <b>LSMS_DIR</b> environment variable is not set                                                                                   | Verify the environment variables.                                                                              |
| 3         | lsms: send: <i>errornumber</i>                                                | Attempt to send command to agent failed. <i>errornumber</i> is the error returned by send.                                        | Contact My Oracle Support.                                                                                     |
| 3         | lsms: socket: <i>errornumber</i>                                              | Attempt to open <b>UDP</b> socket failed. <i>errornumber</i> is the error returned by socket.                                     | Contact My Oracle Support.                                                                                     |
| 2         | npacagent: Permission denied for npacagent or executable not found.           | Operator does not have permission to execute this command or executable could not be found. The operator must be an lsmsadm user. | Change user to lsmsadm or lsmsall and try the command again. If the error persists, contact My Oracle Support. |

**Table A-13 (Cont.) Error Messages: lsms**

| Exit Code | Message                                                                                                                                                                | Cause                         | Suggested Recovery                              |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------|
| 2         | Unknown region ==>< region name > must be one of the following:<br><br>Canada<br>MidAtlantic<br>Midwest<br>Northeast<br>Southeast<br>Southwest<br>WestCoast<br>Western | Invalid NPAC region specified | Try the command again with a valid region name. |
| 2         | Usage: lsms [ start   stop ] <region>                                                                                                                                  | Invalid action specified      | Try the command again with correct syntax.      |

## A.2.9 lsmsdb

### Database Maintenance Utility

The **LSMS Database** Command-Line Utility (a MySQL client), `$LSMS_TOOLS_DIR/lsmsdb`, provides the capability of obtaining information and performing maintenance operations on the **LSMS** database. Additionally, the `lsmsdb` command is used to provide information and perform operations to configure query servers.

The syntax for `lsmsdb` as used within this document is as follows:

### Keyword

`lsmsdb`

### Permission

The user can be `root` or be defined as a member of the primary group `lsms`.

### Syntax

```
$LSMS_TOOLS_DIR/lsmsdb -c <command> [-b <basedir>] [-d <database>] [-h <hostname>] [-p <password>] [-u <username>]
```

### -c <command> Options

#### **adduser**

Creates **TPD** and MySQL users, both with the same password. Must be run as `root`. When the `adduser` command option is specified, the `-u <username>` option is required.

**addrepluser**

Sets up a special replication user at the **LSMS** with privileges and permission that a query server can use to access the **LSMS** and perform database replication. When the `addrepluser` command option is specified, the `-h <hostname>` and `-p <password>` options are required. SECURITY NOTE: The combination of username and password is unique to replication use and only provides read access to the resynchronization binary log on the **LSMS** system. Additionally, access to this user account is restricted to the hostname specified. If the maximum number of **EAGLE** nodes supported would be exceeded, the command terminates with the following error:

```
"Failed: The maximum number of eagles supported has been reached."
```

**chguserpw**

Allows modification of the **TPD** and MySQL passwords. Can be run as root, or as the user who wants to change the password. When the `chguserpw` command option is specified, the `-u <username>` option is required.

**Note:**

The `lsmsdb - c chguserpw - u <username>` command must be run on both the primary and the secondary servers to completely change the password.

**counts**

Displays counts of records in specified database.

**dblist**

Displays list of databases (if the `-d` option is specified, it is ignored).

**features**

Displays current settings of all optional features.

**users**

Lists all defined **LSMS GUI** users.

**masterstatus**

Displays status information (log name and position) on the binary log of the master server (**LSMS**).

**ping**

Pings the `mysqldaemon`.

**queryservers**

Displays the connection status of all query servers that are directly connected to the **LSMS**. The connection status for each query server (denoted by hostname and IP address) is displayed as `Connected`, `Disconnected`, `Not Reachable`, or `Hostname not associated with IP address`. For this command to show correct connection status between **LSMS** and a query server, a new user must be created on the query server. For information about how to create this user to check replication status from **LSMS**, see the *Query Server Installation and Upgrade Instructions*.



**quickaudit**

Performs a quick comparison of the number of rows in all of the database tables on both the active and standby servers. It returns "0" if the comparison on the active and standby servers results in a match; it returns various error numbers and error messages if the comparison does not produce a match or if a problem was encountered.

 **Note:**

Do not specify this option when the LSMS is performing bulk download. In addition, do not specify this option when any of the following processes are running, due to the possibility of disk space shortage: backups, starting a standby node (to change its state from UNINITIALIZED "INHIBITED" to STANDBY), running the `import` command, and creating query server snapshots. Since backups can be run automatically, perform the procedure described in [Checking for Running Backups](#) to ensure that no backups are running.

This option:

- Takes about 5 seconds to run.
- Must be run from the active server.
- Checks first to see if the standby server is more than 5 seconds behind the active server; if it is, an error message is generated and quickaudit does not proceed.

**rmrepluser**

Removes a replication user at the **LSMS**. When the `rmrepluser` command option is specified, the `-h <hostname>` option is required.

**rmuser**

Deletes **TPD** and MySQL users. Must be run as root. When the `rmuser` command option is specified, the `-u <username>` option is required.

**shutdown**

Stops `mysql` (if the `-d` option is specified, it is ignored).

**snapshot**

Creates a snapshot of the **LSMSLNP** database to be used to setup query servers and/or for disaster recovery. When the `snapshot` command option is specified, the `-b <basedir>` option is optional.

During the creation of a snapshot of the **LSMS LNP** database, the following occurs:

- A read lock will be obtained
- Table information is flushed
- Binary logs (if already existing) are removed and a new one started (with log numbered 1)
- MySQL server performs a shutdown
- All **LSMS** database tables are archived as compressed files, `mysql-snapshot-supDB.tar.gz` and `mysql-snapshot-<regionDB>.tar.gz` (by default in `/var/TKLC/lms/db`, although the `-b` option changes this base directory)
- MySQL server is restarted
- The read lock is released

### **start**

Starts `mysql` (if the `-d` option is specified, it is ignored).

### **syspwexp**

Modifies the system level default password timeout interval.

### **usrpwexp**

Modifies the user level default password timeout interval, the `-u <username>` option is required.

## **Options**

### **-b basedir**

Base directory for storing snapshots.

### **-d database**

Run the command on the database specified by this option. If the `-d` option is not specified, the command is run on all databases.

### **-h hostname**

Name of the host.

### **-p password**

User's password.

### **-u username**

LSMS user's username.



### **Note:**

The `-c` flag is required.

## **Sample Input and Output**

```
$./lsmsdb -c features
```

```

Y AFT
Y EDR
Y ENHANCED_FILTERS
Y HTTP
Y HTTPS
16 MAX_EAGLES
32 MAX_SPIDS
8 MAX_USERS
Y QUERY_SERVER
Y REPORT_GEN
0 REPORT_GEN_QUERY_ACTIVE
Y SNMP
Y SPID_SECURITY
Y WSMSC
N WSMSC_TO_EAGLE
```

```
$./lsmsdb -c counts -d NortheastDB

1 NortheastDB.NumberPoolBlock
1 NortheastDB.ServiceProvLRN
0 NortheastDB.ServiceProvNPA_NXX
0 NortheastDB.ServiceProvNPA_NXX_X
1 NortheastDB.ServiceProvNetwork
39,756 NortheastDB.SubscriptionVersion

$ $LSMS_TOOLS_DIR/lsmsdb -c addrepluser -h queryserver1 -p password
$ $LSMS_TOOLS_DIR/lsmsdb -c masterstatus

Lmspri-bin.001 73

$LSMS_TOOLS_DIR/lsmsdb -c queryservers

queryserver1 (10.25.60.28) Connected
queryserver2 (10.25.60.45) Disconnected
queryserver3 (10.25.60.31) Not Reachable
queryserver4 (Unknown) Hostname not associated with IP address

$LSMS_TOOLS_DIR/lsmsdb -c rmrepluser -h queryserver1 -p password
$LSMS_TOOLS_DIR/lsmsdb -c snapshot

WARNING: For the duration of this command, traffic being sent from the NPAC
to connected network elements and local LSMS provisioning will be
INTERRUPTED.
Do you want to continue? [Y/N] Y
```

## A.2.10 lsmsSNMP

### SNMP Agent Process Control

Lets you start, stop, or show status of the **SNMP** Agent process. For more information about the **SNMP** agent process, see [“Understanding the SNMP Agent Process”](#).

#### Keyword

lsmsSNMP

#### Permission

Any user who belongs to the lsmsadm permission group.

#### Restrictions

The **LSMS\_DIR** environment variable must be set.

## Syntax

\$LSMS\_DIR/lsmSNMP <Action>

## Options

None.

## Parameters

### Action

Function to perform on the **SNMP** agent. This is a mandatory parameter with the following values:

```
start
stop
status
```

## Sample Output

```
#Stop the SNMP Agent
> $LSMS_DIR/lsmSNMP stop
LSMS SNMP Agent stopped: Fri Mar 10 09:50:47 2000 #Start the SNMP Agent
> $LSMS_DIR/lsmSNMP start
LSMS SNMP Agent started: Fri Mar 10 10:50:47 2000 #Determine the SNMP Agent
status
> $LSMS_DIR/lsmSNMP status
LSMS SNMP AGENT PROCESS STATUS:
TOTAL SUCCESSFUL TRAP REQUEST= 12
TOTAL FAILED TRAP REQUEST = 2
== IP-ADDRESS == == STATUS ==
177.88.34.7 Failed
198.77.39.2 SNMP Session Established
```

## Files

[Table A-15](#) shows the files for the lsmSNMP command.

**Table A-14 Files: lsmSNMP**

| Filename | Type               | Location                    |
|----------|--------------------|-----------------------------|
| snmp.cfg | Configuration file | /usr/TKLC/plat/etc/<br>snmp |

## Possible Errors

**Table A-15 Exit Codes: lsmSNMP**

| Exit Code | Cause                   | Suggested Recovery         |
|-----------|-------------------------|----------------------------|
| 1         | Failed operation.       | Contact My Oracle Support. |
| 2         | Operation not required. | No action necessary.       |
| 3         | Usage error.            | Correct the syntax.        |

Table A-15 (Cont.) Exit Codes: IsmsSNMP

| Exit Code | Cause                             | Suggested Recovery                        |
|-----------|-----------------------------------|-------------------------------------------|
| 4         | Fatal application error           | Contact My Oracle Support.                |
| 5         | Server not active.                | Execute the command on the active server. |
| 6         | <b>LSMS</b> software not running. | Start the <b>LSMS</b> .                   |

This command is usually run by scripts; scripts should search for exit codes. When the command is run from the command line, the output indicates suggested recovery.

## A.2.11 lsmssurv

### Surveillance Monitor Control

Starts, stops, and retrieves the status of the Surveillance Monitor.

The notification output from the Surveillance Monitor is written to Serial Port 3 on each server. The non-active server, whether its state is **STANDBY** or **UNINITIALIZED "INHIBITED"**, sends surveillance notifications only for platform events that it detects on itself. It also forwards those notifications to the active server.

- The active server sends surveillance notifications for:
  - All platform events that the active server detects on itself
  - All platform notifications received from the non-active server (the active server inserts the hostname of the non-active server before the event text for these notifications)
  - Some applications events (not all application events generate surveillance notifications; for more information, see [Automatic Monitoring of Events](#)).

By default, all notification output that is sent to Serial Port 3 on a given server is written also to the log file on that server, `/var/TKLC/lms/logs/survlog.log`. (See [“Files”](#).)

### Keyword

`lsmssurv`

### Permission

The user must be `root` to specify the `start` or `stop` for `<Action>`.

### Syntax

```
$LSMS_DIR/lsmssurv <Action>
```

### Options

None.

### Parameters

#### Action

Specifies the action to be performed on the Surveillance Monitor. This is a mandatory parameter with the following values:

```
start
stop
status
last
```

### Sample Output

```
Start LSMS Surveillance Process
#
$LSMS_DIR/lsmssurv start
LSMS Surveillance feature started
Request LSMS Surveillance Process status
#
$LSMS_DIR/lsmssurv status
LSMS Surveillance feature is currently started
Stop LSMS Surveillance Process
#
$LSMS_DIR/lsmssurv stop
LSMS Surveillance feature stopped
Return LSMS Surveillance Process to last valid state. The following
output indicates that the process had been running prior to termination
#
$LSMS_DIR/lsmssurv last
LSMS Surveillance feature started
#
```

### Files

[Table A-16](#) shows the files for the `lsmssurv` command.

**Table A-16 Files: lsmssurv**

| Filename     | Type                  | Location                 |
|--------------|-----------------------|--------------------------|
| lsmssurv.log | Error/Debug log file  | /var/TKLC/lsmssurv/logs/ |
| survlog.log  | Notification log file | /var/TKLC/lsmssurv/logs/ |

### Response Notes

The designated response will not occur for five to ten seconds after execution.

### Possible Errors

**Table A-17 Error Messages: lsmssurv**

| Exit Code | Message                                         | Cause                                | Suggested Recovery   |
|-----------|-------------------------------------------------|--------------------------------------|----------------------|
| 1         | LSMS Surveillance feature is currently running. | LSMS Surveillance feature is running | No action necessary. |

**Table A-17 (Cont.) Error Messages: lsmsurv**

| Exit Code | Message                                                                                                                  | Cause                                                                     | Suggested Recovery         |
|-----------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------|
| 1         | LSMS Surveillance feature is not currently running.                                                                      | <b>LSMS</b> Surveillance feature is not running                           | No action necessary.       |
| 1         | LSMS Surveillance feature did not start successfully Please review log file: /var/TKLC/lsms/logs/lsmsSurv.log for errors | Socket communication problems, hang on opening of console/serial ports    | Contact My Oracle Support. |
| 1         | Must be root to start the LSMS Surveillance feature                                                                      | User <b>ID</b> must be root to start the <b>LSMS</b> Surveillance feature | Change user to root.       |

## A.2.12 massupdate

### SPID Mass Update

The optional mass update utility provides the ability to migrate subscription version, number pool block, and network data from one Service Provider **ID (SPID)** to another based on an input file downloaded from the **NPAC**. The mass update utility reads **SIC-SMURF** files for **LRN**, **NPA-NXX**, and **NPA-NXX-X**, performs the required database updates and, in the case of **LRN** data, forwards an appropriate Update Override GTT message to the **EAGLE**.

### Keyword

massupdate

### Permission

The user must be logged in with the user name `lsmsadm`.

### Syntax

```
$LSMS_DIR/massupdate [-v] [-p] [-n <npacRegion>] <filename>
```



### Note:

Stop the `npacagent` process for the region in question when the `-n` option is used. It is not necessary to stop the `npacagent` processes for all eight regions when the `-n` option is used.

### Optional flags:

**-v**

Provides verbose output.

**-p**

Perform “pre-check” but make no database updates.

**-n**

Perform the mass update only for the region named by the `<npacRegion>` parameter. Only one **NPAC** region may be entered after the `-n` option

### Parameters

**<npacRegion>**

The name of the region to perform the mass update for.

**<filename>**

The name of the **SIC-SMURF** file to process.



#### Note:

The filename must be in the following format:

**SIC-SMURF-[LRN|NPANXX|NPANXXX].OldSpid.NewSpid.DD-MM-YYYYHH24MISS**

**Example:** SIC-SMURF-NPANXX.0001.0002.25-12-1996081122

### Sample File Content Format

```
cat SIC-SMURF-LRN.TKLC.SP05.06-13-2003101010
tklc|SP05|2000000000
cat SIC-SMURF-NPANXXX.tklc.SP05.06-25-2004101010
tklc|SP05|9996000
cat SIC-SMURF-NPANXX.tklc.SP05.06-25-2004101010
tklc|SP05|333444
```

### Sample Output

```
$ $LSMS_DIR/massupdate SIC-SMURF-LRN.1234.9876.15-03-2002121530
```

```
One or more npacagents processes are currently running. They must be
Stopped prior to mass spid updates by executing the following command:
/lsms stop <region>
Massupdate: exiting.
```

```
$ $LSMS_DIR/massupdate SIC-SMURF-LRN.1234.9876.15-03-2002121530
```

```
WARNING: The supman, lsman or an eagleagent process is currently running. It
is recommended that all of these processes be stopped prior to mass spid
```



updates to prevent modifications of GTT data during execution of this command.  
Do you wish to continue [N]?  
Massupdate: exiting.

```
$ $LSMS_DIR/massupdate -v SIC-SMURF-LRN.1234.9876.15-03-2002121530
```

```
Using SIC-SMURF File: SIC-SMURF-LRN.1234.9876.15-03-2002121530
Performing Mass Update of SPIDs for LRN data...
Updating LRN 2223334000 from SPID 1234 to SPID 9876...
5 OverrideGtt object(s) updated in supported database
1 ServiceProvLRN object(s) updated in Southeast region
4 NumberPoolBlock object(s) updated in Southeast region
Updating LRN 2224441000 from SPID 1234 to SPID 9876...
0 OverrideGtt object(s) updated
1 ServiceProvLRN object(s) updated in Southeast region
10 NumberPoolBlock object(s) updated in Southeast region
Updating LRN 2225550000 from SPID 1234 to SPID 9876...
4 OverrideGtt object(s) updated
0 ServiceProvLRN object(s) updated in Southeast region
4 NumberPoolBlock object(s) updated in Southeast region
Updating SubscriptionVersion tables (this may take a while)...
790 SubscriptionVersion object(s) updated in Southeast region
Command stats

Lines processed: 3
Successful: 3
Failed: 0
Command complete.
$
```

```
$ $LSMS_DIR/massupdate -p SIC-SMURF-LRN.TKLC.SP05.06-30-2004101010
```

WARNING: The supman, lsman or an eagleagent process is currently running. It is recommended that all of these processes be stopped prior to mass spid updates to prevent modifications of GTT data during execution of this command.  
Do you wish to continue [N]? Y

START Mass update command: Thu Nov 8 13:41:57 EST 2007

Precheck mode: Makes NO CHANGES, but reports everything as if updating.

Executing mass update for all regions...  
{Precheck only}

Reading SIC-SMURF File: SIC-SMURF-LRN.TKLC.SP05.06-30-2004101010

Performing Mass Update of SPIDs for LRN data... {Precheck only}

Command stats {Precheck only}

```

Lines processed: 1
Successful: 1
Failed: 0
```

Mass update command complete: Thu Nov 8 13:41:57 EST 2007

**Table A-19** identifies the database tables and fields that are updated after invoking `massupdate` for the various **SIC-SMURF** files.

For each table/field that is affected, the field that is checked for a match is listed under the appropriate **SIC-SMURF** filename. Under the Table/Field column, the database containing the object to be updated (for example, SupDB), the table to be updated (for example, OverrideGTT), and the field to be updated (for example, spid) are listed.

Under each **SIC-SMURF** file type, the field to be used for the match (for example, lrn) is listed for each Table/Field impacted by the update. For example, for **LRN SIC-SMURF** files, the SupDB OverrideGTT table's spid is updated if the lrn is matched.

**Table A-18 Tables/Fields Affected By SIC-SMURF Processing**

| Table/Field                                                         | LRN<br>SIC-SMURF | NPA-NXX SIC-<br>SMURF | NPA-NXX-X<br>SIC-SMURF |
|---------------------------------------------------------------------|------------------|-----------------------|------------------------|
| supDB.OverrideGtt.spid                                              | lrn              |                       |                        |
| supDB.LsmsServiceProvider.spid (create if required)                 | spid             |                       |                        |
| supDB.GttGroupSpid.spid (create if required)                        | spid             |                       |                        |
| <regionDB>.ServiceProvLRN.serviceProviderId                         | lrn              |                       |                        |
| <regionDB>.ServiceProvNPA_NXX.serviceProvId                         |                  | npanxx                |                        |
| <regionDB>.ServiceProvNPA_NXX_X.service-<br>ProvId                  |                  |                       | npanxx_x               |
| <regionDB>.ServiceProvNetwork.serviceProvId<br>(create if required) | spid             | spid                  | spid                   |
| <regionDB>.SubscriptionVersion.newCurrentSp                         | lrn              |                       |                        |
| <regionDB>.NumberPoolBlock.newCurrentSp                             | lrn              |                       |                        |

If an Override **GTT** entry is modified and there is no **LSMS** Service Provider with the NewSpid, then one is created. If that **LSMS** Service Provider **SPID** is not a member of the **GTT** group for a modified Override **GTT**, then that membership is added by creating a **GTT** Group **SPID** table entry.

If a ServiceProvLRN, ServiceProvNPA\_NXX, or ServiceProvNPA\_NXX\_X object is modified and there is no ServiceProvNetwork object with the NewSpid, then one is created.

#### LsmsServiceProvider Limit

The mass update utility creates LsmsServiceProvider objects, if needed, even if creating them exceeds the maximum number of SPIDs supported (as recorded in the MAX\_SPIDS field in the DbConfig entry.) However, the fact that the limit has been exceeded is recorded in the log file and the limit remains in force otherwise.

#### Mass Update Log File

To record information or errors during the mass update or the precheck, the mass update utility appends to a log file named `massupdate.log.MMDD`, located in the `$LSMS_DIR/./logs/massupdate` directory. The `.MMDD` suffix is the month and day the massupdate execution begins. If the massupdate runs past midnight, it will keep all output from one massupdate

execution in one file, so the file will not be split across days but continue in the same file it started in. The following information is written to the log file by the mass update utility:

- The path name of the mass update input file being used
- The time and date for the start and stop of utility execution
- Identifying information for all automatically created objects, whether ServiceProvNetwork or LsmsServiceProvider, including the adding of a (possibly already existing) LsmsServiceProvider to a GttGroup and noting if a newly created LsmsServiceProvider is over the MAX\_SPIDS limit
- Identifying information for any LsmsServiceProvider objects that are no longer used in any OverrideGtt as a result of the mass update and therefore could be removed
- Output from the precheck
- Any kind of processing problem or error
- A summary showing the number of lines actually processed successfully for each invocation of the utility (not needed for precheck mode)

## Error Codes

**Table A-19 Error Codes: massupdate**

| Error Code | Cause                                | Suggested Corrective Action                                                                                                                            |
|------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0          | Success                              | None required.                                                                                                                                         |
| 1          | Command syntax error                 | Rerun the command with the proper syntax.                                                                                                              |
| 2          | Feature not enabled                  | Enable optional feature.                                                                                                                               |
| 3          | <b>SIC-SMURF</b> file not found      | Verify path and filename for <b>SIC-SMURF</b> file.                                                                                                    |
| 4          | Unable to open <b>SIC-SMURF</b> file | Verify permissions on <b>SIC-SMURF</b> file.                                                                                                           |
| 5          | Incorrect file format                | Supply valid <b>SIC-SMURF</b> file for processing.                                                                                                     |
| 6          | massupdate already running           | Do not attempt to execute more than one massupdate process at the same time.                                                                           |
| 7          | npacmassupdate executable not found  | Define environment variable <b>LSMS_DIR</b> or contact My Oracle Support.                                                                              |
| 8          | <b>Database</b> error                | Make sure the database server is running.                                                                                                              |
| 9          | User chose to stop                   | None needed.                                                                                                                                           |
| 10         | npacagent running                    | If massupdate is run for all regions, stop all npacagent processes. If massupdate is run for a single region, stop the npacagent for that region only. |
| 11         | Unable to write                      | Remove <filename>_FAILED file and verify directory permissions.                                                                                        |
| 12         | Invalid user                         | Rerun as user lmsadm.                                                                                                                                  |

## A.2.13 measdump

### Print Measurement Information

Lets you print measurement information (contained in databases) to the display.

### Keyword

measdump

### Permission

The user must be logged in with the user name in the `lsmsuser`, `lsmsuext`, `lsmsview`, or `lsmsall`, group.

### Syntax

```
$LSMS_TOOLS_DIR/measdump {-r <region>|-c <CLLI> [-n]}
```

### Required Flags

Specify one of the following flags:

#### -r <region>

**NPAC** region associated with this `npacagent` process. This is a mandatory parameter with the following values:

- Canada
- Midwest
- MidAtlantic
- Southeast
- Southwest
- Northeast
- Western
- WestCoast

#### -c <CLLI>

**Common Language Location Identifier** for the network element for which you wish to display measurements.

### Optional Flags

Optionally specify one of the following flags:

#### -l

Lets you create measurement logs (a `<region>.meas.<MMDD>` file for each **NPAC** region and a `<clli>.meas.<MMDD>` file for each network elements) for compatibility with previous releases of the **LSMS**.

#### -n

Number of days before current day for which measurements are to be displayed, where `n` can have one of the values shown in [Table A-21](#) (if this option is not specified, the default value is 0):

**Table A-20 Measurement Pegs Date**

| Value | Print Measurement Pegs for the Date of: |
|-------|-----------------------------------------|
| 0     | Today                                   |
| 1     | Yesterday                               |
| 2     | Two days before current date            |
| 3     | Three days before current date          |
| 4     | Four days before current date           |
| 5     | Five days before current date           |
| 6     | Six days before current date            |

**Sample Output**

```
$ measdump -r Midwest -2
```

```
measdump: There is no measurement data available for the requested day.
```

```
$ measdump -r Midwest
```

| Hour | Binds | SuccessOps | FailedOps |
|------|-------|------------|-----------|
| 0    | 0     | 0          | 0         |
| 1    | 0     | 0          | 0         |
| 2    | 0     | 0          | 0         |
| 3    | 0     | 0          | 0         |
| 4    | 0     | 0          | 0         |
| 5    | 0     | 0          | 0         |
| 6    | 0     | 0          | 0         |
| 7    | 0     | 0          | 0         |
| 8    | 0     | 0          | 0         |
| 9    | 0     | 0          | 0         |
| 10   | 1     | 0          | 0         |
| 11   | 0     | 0          | 0         |
| 12   | 0     | 0          | 0         |
| 13   | 0     | 0          | 0         |
| 14   | 0     | 0          | 0         |
| 15   | 0     | 0          | 0         |
| 16   | 0     | 0          | 0         |
| 17   | 0     | 0          | 0         |
| 18   | 0     | 0          | 0         |
| 19   | 0     | 0          | 0         |
| 20   | 0     | 0          | 0         |
| 21   | 0     | 0          | 0         |
| 22   | 0     | 0          | 0         |
| 23   | 0     | 0          | 0         |

## Possible Errors

**Table A-21 Error Messages: measdump**

| Exit Code | Error Message | Cause                                                                             | Suggested Recovery                             |
|-----------|---------------|-----------------------------------------------------------------------------------|------------------------------------------------|
| -1        | Syntax error  | User entered command with incorrect syntax.                                       | Try the command again with the correct syntax. |
| 1         | DbError       | <b>Database</b> exception. Contact Oracle.                                        | Contact My Oracle Support.                     |
| 2         | EnvNotSet     | The <b>LSMS_DIR</b> env variable is not set.                                      | Verify the environment variables.              |
| 3         | NoData        | No measurement data available for the specified day (the agent was never started) | No action necessary.                           |
| 4         | UnknownError  | Not known.                                                                        | Contact My Oracle Support.                     |

## A.2.14 npac\_db\_setup

### NPAC Database Maintenance

Creates or removes the regional **NPAC** database.

### Keyword

`npac_db_setup`

### Permission

The user must be logged in with the user name `lsmsadm`.

### Restrictions

- This command must be run on each server.
- If a database is in use by a regional **LSMS** agent, it cannot be removed.
- If a regional database has already been created, it must be removed before it can be created again.

### Syntax

`$LSMS_DIR/npac_db_setup <Action> <Region>`

This command must be run from the **\$LSMS\_DIR** directory and run only from the primary server.

### Options

None.

## Parameters

### Action

Specifies the action to be performed on the database. This is a mandatory parameter with the following values:

```
create
remove
```

### Region

**NPAC** region associated with this `npacagent`. This is a mandatory parameter with the following values:

```
Canada
Midwest
MidAtlantic
Southeast
Southwest
Northeast
Western
WestCoast
```

## Sample Output

# Create **NPAC** database for Canada region for the first time

```
> $LSMS_DIR/npac_db_setup create Canada
```

```

Npac Region Database Setup Script
The Region Database Name is CanadaDB
Initializing regional database...CanadaDB
The regional database CanadaDB was created successfully.
>
```

```
> $LSMS_DIR/npac_db_setup remove Northeast
```

# Remove **NPAC** database for Northeast Region

```

Npac Region Database Setup Script
The Region Database Name is NortheastDB
Warning: NPAC region database CanadaDB is about to be removed.

All data in the database will be lost.

Do you want to continue? [Y/N]Y
Removing regional database...CanadaDB
>
```

## Response Notes

This command takes approximately 35 to 40 seconds to execute.

## Possible Errors

**Table A-22 Error Messages: npac\_db\_setup**

| Exit Code | Cause                                                   | Suggested Recovery                                                 |
|-----------|---------------------------------------------------------|--------------------------------------------------------------------|
| 1         | Syntax was incorrect                                    | Use correct syntax.                                                |
| 2         | MySQL command failed                                    | Contact Oracle.                                                    |
| 7         | User attempted to create a database that already exists | None needed.                                                       |
| 9         | User attempted to remove a database that is in use      | Stop indicated processes before attempting to remove the database. |
| 10        | The root user cannot execute this command               | Change users to <code>lsmsadm</code> .                             |
| 12        | User attempted to remove database for an active region  | Make region inactive and retry command.                            |

## A.2.15 npacimport

### Import Specific Files into a Regional Database

Allows user to import specific files into the regional **NPAC** database.

#### Keyword

`npacimport`

#### Permission

The user must be logged in with the user name `lsmsadm`.

#### Restrictions

This command must be run from the `$LSMS_DIR` directory and run only from the primary server.

#### Syntax

```
$LSMS_TOOLS_DIR/npacimport [-h] -r <region> -i <type> [-u] [-y] [-t
<number>] [-c <number>] <filename>
```

#### Required Flags

##### **-r <region>**

Specifies the region whose database the imported files are intended for. This is a mandatory parameter with the following values:

- Canada
- MidAtlantic
- Midwest
- Northeast
- Southeast



Southwest  
WestCoast  
Western

#### **-i <type>**

Specifies the type of the file to be imported into the database. This is a mandatory parameter with the following values:

SubscriptionVersion  
NumberPoolBlock  
ServiceProvNetwork  
ServiceProvLRN  
ServiceProvNPA-NXX  
ServiceProvNPA-NXX-X

#### **Parameters**

##### **<filename>**

Specifies the input file of pipe delimited records to be used.

#### **Optional Flags**

##### **-h**

Display Help text and quit.

##### **-u**

Time-range update: May modify or delete and does not purge object range first. Not valid for ServiceProvNetwork.

##### **-y**

Continue on if a record update fails.

##### **-t**

Specify number of threads to use (maximum number is 10).

##### **-c**

Specify number of records in each batch to a thread (default is 1000).

#### **Exit Codes**

[Table A-23](#) lists the exit codes generated by the `npacimport` command.

**Table A-23 Exit Codes: npacimport**

| Exit Code | Cause                            | Suggested Recovery                                   |
|-----------|----------------------------------|------------------------------------------------------|
| -1        | Invalid syntax                   | Correct the syntax.                                  |
| 1         | <b>Database</b> error            | Contact My Oracle Support.                           |
| 2         | File access error                | Contact My Oracle Support.                           |
| 3         | Invalid record in the input file | Correct the file entry or contact My Oracle Support. |
| 4         | Invalid user                     | Change user to <code>lsmsadm</code> .                |
| 5         | Unknown error                    | Contact My Oracle Support.                           |

This command is usually run by scripts; scripts should search for exit codes. When the command is run from the command line, the output indicates suggested recovery.

## A.2.16 report

### Report Generation

Generates reports for regional **NPAC** databases and supplemental databases.

### Keyword

report

### Permission

The user must be defined as a member of the primary group `lsms`.

### Syntax

```
$LSMS_DIR/report <OutputFile> <ReportType> [<SP>|<LRN>|<DPC>|<Region>|
<SplitStatus>] [<StartTN>] [<EndTN>] [<StartNPB>] [<EndNPB>]
```

### Options

None.

### Parameters

#### OutputFile

The filename for the file in which to store the report. This is a mandatory parameter whose value is the filename. The filename is appended with the value specified for `<ReportType>` and the file is stored in the directory where the command is run.

#### ReportType

The type of report to create. This is a mandatory parameter; use one of the following values:

- SPA - Service Provider Administrative Report
- SPN - Service Provider Network Report
- EMR - Element Management Report
- 6DT - Six Digit Translation Report
- 10DT - Ten Digit Translation Report
- SPL - **NPA** Split Data by Status Report
- SBL - Subscription Report by **LRN**
- SBS - Subscription Report by Service Provider **ID**
- SBT - Subscription Report by **TN**
- NBL - Number Pool Block Report by **LRN**
- NBS - Number Pool Block Report by Service Provider **ID**
- NBN - Number Pool Block Report by **NPA-NXX-X**
- SPD - Service Provider Data Report

#### **SP**

Four-character alphanumeric string to specify Service Provider **ID**. This is a mandatory parameter when `<ReportType>` is set to SBS or NBS; optional when `<ReportType>` is set to 6DT, 10DT, EMR, or SPN; otherwise not allowed.

#### **LRN**

Ten-digit string (values 0000000000–9999999999) to specify **Location Routing Number**. This is a mandatory parameter when `<ReportType>` is set to SBL or NBL; otherwise not allowed.

#### **DPC**

Eleven-character string of format xxx-xxx-xxx (where each xxx can have a value 000 to 256) to specify **Destination Point Code**. This is an optional parameter when `<ReportType>` is set to 6DT or 10DT; otherwise not allowed.

#### **Region**

**NPAC** region. This is an optional parameter when `<ReportType>` is set to SPL; otherwise not allowed. Use one of the following values:

MidAtlantic  
Midwest  
Northeast  
Southeast  
Southwest  
Western  
Westcoast  
Canada

#### **SplitStatus**

**NPA-NXX** split status. This is an optional parameter when `<ReportType>` is set to SPL; otherwise not allowed. Use one of the following values:

Active  
Pending  
Error

#### **StartTN**

Starting telephone number in a range of telephone numbers. This is a mandatory parameter when `<ReportType>` is set to SBT. Valid values are 10 digits from 0000000000 to 9999999999.

#### **EndTN**

Ending telephone number in a range of telephone numbers. This is a mandatory parameter when `<ReportType>` is set to SBT. Valid values are 10 digits from 0000000000 to 9999999999.

#### **StartNPB**

Starting value in a range of number pool blocks. This is a mandatory parameter when `<ReportType>` is set to NBN. Valid values are 7 digits from 0000000 to 9999999.

#### **EndNPB**

Ending value in a range of number pool blocks. This is a mandatory parameter when `<ReportType>` is set to NBN. Valid values are 7 digits from 0000000 to 9999999.

## Sample Commands

```
Generate SPA report for MidAtlantic NPAC
$ $LSMS_DIR/r eport report.output SPA
Generate SBL report for MidAtlantic NPAC for LRN 9194605500
$ $LSMS_DIR/report report.output SBL 9194605500
Generate SPL report> $LSMS_DIR/report report.output SPL
Generate SBS report for Midwest NPAC for all Subscriptions having a
serviceprovider
of TKLC and a TN in the range of 9194600000 to 9195600000
$ $LSMS_DIR/report report.output SBS TKLC 9194600000 9195600000
Generate SBT report for Western NPAC for all Subscriptions having a TN in
the range of 9194600000 to 9195600000
$ $LSMS_DIR/report report.output SBT 9194600000 9195600000
```

## Files

Table A-25 shows the files for the `report` command.

**Table A-24 Files: report**

| Filename | Type               | Location                                      |
|----------|--------------------|-----------------------------------------------|
| Output   | Report Output File | /var/TKLC/lsmc/free/data/<br>reports/lsmcadm/ |

## Response Notes

The `report` command can process approximately 300-500 records per second, depending upon the type of report.

To view the report, change directory to the directory where the command was run and use any text editor to open the file named in the command. If you run the command from the `$HOME/LSMSreports` directory, you can also view the report through the graphical user interface; for information, refer to the *Database Administrator's Guide*.

## Possible Errors

**Table A-25 Error Messages: report**

| Exit Code | Message                      | Cause                                           | Suggested Recovery                                               |
|-----------|------------------------------|-------------------------------------------------|------------------------------------------------------------------|
| 1         | DATABASE <name> NOT<br>FOUND | Specified database could<br>not be found        | Verify that the database<br>exists and try the command<br>again. |
| 1         | disk space check<br>failed   | Attempt to check available<br>disk space failed | Remove unnecessary<br>reports from disk.                         |

Table A-25 (Cont.) Error Messages: report

| Exit Code | Message                                                                                                                             | Cause                                                                                                                                                                                       | Suggested Recovery                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1         | End TN must be greater than Start TN value.                                                                                         | The start <b>TN</b> is greater than the end <b>TN</b> in the range of <b>TNs</b> to generate an <b>LSMS</b> subscription report                                                             | Try the command again using the correct syntax and supplying all required arguments. |
| 1         | Insufficient disk space available to generate report. <i>N</i> bytes of disk space required: <i>n</i> bytes of disk space available | Insufficient disk space to save report                                                                                                                                                      | Remove unnecessary reports from disk.                                                |
| 1         | Invalid End TN value - <EndTN>                                                                                                      | The last <b>TN</b> in the range of <b>TNs</b> to generate an <b>LSMS</b> subscription report is out of range. The valid range of values for a telephone number is 0000000000...9999999999.  | Try the command again using the correct syntax and supplying all required arguments. |
| 1         | Invalid Report Type Specified <Report Type>                                                                                         | The value specified for the ReportType parameter is not valid.                                                                                                                              | Try the command again using the correct syntax and supplying all required arguments. |
| 1         | Invalid Start TN value - <StartTN>                                                                                                  | The first <b>TN</b> in the range of <b>TNs</b> to generate an <b>LSMS</b> subscription report is out of range. The valid range of values for a telephone number is 0000000000...9999999999. | Try the command again using the correct syntax and supplying all required arguments. |
| 1         | LRN argument is required for SBL/NBL report                                                                                         | If <ReportType> parameter is specified as <b>SBL</b> or <b>NBL</b> , the < <b>LRN</b> > parameter must also be specified                                                                    | Try the command again using the correct syntax and supplying all required arguments. |
| 3         | LRN argument must be exactly 10 numeric digits                                                                                      | An < <b>LRN</b> > parameter that had less than 10 digits, more than 10 digits, or non-numeric characters was specified                                                                      | Try the command again using the correct syntax and supplying all required arguments. |
| 1         | Missing mandatory arguments                                                                                                         | The command was specified with an insufficient number of arguments.                                                                                                                         | Try the command again using the correct syntax and supplying all required arguments. |
| 1         | NO ACCESS RIGHTS TO DATABASE                                                                                                        | Requesting operator does not have access rights to the database                                                                                                                             | Change user to a username that has access rights to the database.                    |

**Table A-25 (Cont.) Error Messages: report**

| Exit Code | Message                                                                                                    | Cause                                                                                                          | Suggested Recovery                                                                   |
|-----------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 4         | Service Provider argument must have from 1 to 4 characters                                                 | The <SP> parameter was specified with more than 4 characters                                                   | Try the command again using the correct syntax and supplying all required arguments. |
| 1         | Service Provider argument required for SBS/NBS report                                                      | If <ReportType> parameter is specified as <b>SBS</b> or <b>NBS</b> , the <SP> parameter must also be specified | Try the command again using the correct syntax and supplying all required arguments. |
| 1         | StartNPB argument is required for NBN report                                                               | If <ReportType> parameter is specified as <b>NBN</b> , the <StartNPB> parameter must also be specified         | Try the command again using the correct syntax and supplying all required arguments. |
| 1         | StartTN argument is required for SBT report                                                                | If <ReportType> parameter is specified as <b>SBT</b> , the <StartTN> parameter must also be specified          | Try the command again using the correct syntax and supplying all required arguments. |
| 1         | Unable to determine home directory of user - report could not be generated                                 | Report could not be stored in home directory of user                                                           | Contact My Oracle Support.                                                           |
| 1         | Unable to open <filename> - report could not be generated                                                  | Could not open the file in which to save the report                                                            | Contact My Oracle Support.                                                           |
| 1         | Usage: report<br><regional_database_name<br>sup_database_name><br>output file<br><report_type>[LRN <br>SP] | Operator did not supply the correct number of arguments                                                        | Try the command again using the correct syntax and supplying all required arguments. |

**Table A-25 (Cont.) Error Messages: report**

| Exit Code | Message                                    | Cause                                                                                                                     | Suggested Recovery                                                                   |
|-----------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1         | Wrong number of arguments for Split report | The <ReportType> parameter was specified as <b>SPLA</b> or <b>SPLR</b> , but the wrong number of parameters was specified | Try the command again using the correct syntax and supplying all required arguments. |

## A.2.17 resync\_db\_setup

### Resynchronization Database Maintenance

Creates or removes the resynchronization database.

#### Keyword

resync\_db\_setup

#### Permission

The user must be logged in with the user name `lsmsadm`.

#### Restrictions

- This command must be run on each server.
- If the resynchronization database has already been created, it must be removed before it can be created again.

#### Syntax

`$LSMS_DIR/resync_db_setup <Action>`

This command must be run from the **\$LSMS\_DIR** directory and run only from the primary server.

#### Options

None.

#### Parameters

##### Action

Specifies the action to be performed on the database. This is a mandatory parameter with the following values:

create  
remove

#### Response Notes

This command takes approximately 35 to 40 seconds to execute.

#### Files

None.

## Possible Errors

**Table A-26 Exit Codes: resync\_db\_setup**

| Exit Code | Cause                                       | Suggested Recovery                                         |
|-----------|---------------------------------------------|------------------------------------------------------------|
| 1         | Missing arguments.                          | Use the correct syntax and supply all required arguments.  |
| 3         | Executing command from wrong directory.     | Change directory to <code>\$LSMS_DIR</code> .              |
| 6         | Invalid action argument.                    | Use the correct syntax and supply a valid action argument. |
| 7         | <b>Database</b> already exists.             | No action necessary.                                       |
| 8         | <b>Database</b> exists on another host.     | No action necessary.                                       |
| 9         | <b>Database</b> in use by process.          | Stop the process that is using the database.               |
| 10        | User is not authorized to use this command. | Change user to <code>lsmsadm</code> .                      |
| 11        | Command executed on secondary server.       | Execute command on the primary server.                     |

This command is usually run by scripts; scripts should search for exit codes. When the command is run from the command line, the output indicates suggested recovery.

## A.2.18 SAagent

### Service Assurance Agent Control

Starts, stops, inhibits automatic restart, allows automatic restart, and retrieves the status of the Service Assurance Agent.

The **SA** Agent can be prevented from starting by inhibiting the process. This action allows you to control whether or not the Surveillance feature automatically starts the agent when it detects that it is not running.

**NOTE: If the SA agent is running, the inhibit action does not take effect until the agent has stopped.**

### Keyword

`SAagent`

### Permission

The user must be defined as a member of the secondary group `lsmsadm`.

### Syntax

`$LSMS_DIR/SAagent <Action>`

### Options

None.



## Parameters

### Action

Specifies the action to be performed on the Service Assurance Agent. This is a mandatory parameter with the following values:

```
start
stop
inhibit
allow
status
```

## Sample Output

```
Start the process
$ $LSMS_DIR/SAagent start
Checking if SA Agent is already running...No Starting SA
Agent...Started...Verifying... SAagent started: 1997 Sept 04 12:13:14 EST
Stop the process, allow Surveillance to restart it.
$ $LSMS_DIR/SAagent stop
Checking if SA Agent is already running...Yes Stopping SA Agent... SAagent
stopped: 1997 Sept 04 12:13:24 EST # Stop the process but keep
Surveillance or the user from starting it. # This case assumes it was stopped.
$ $LSMS_DIR/SAagent inhibit
Saagent inhibited: 1997 Sept 04 12:13:34 EST # Now restart the process
after it had be inhibited.
$ $LSMS_DIR/SAagent allow
Saagent allowed: 1997 Sept 04 12:13:44 EST $ $LSMS_DIR/SAagent start
Checking if SA Agent is already running...No Starting SA
Agent...Started...Verifying... SAagent started: 1997 Sept 04 12:13:45 EST
Request status
$ $LSMS_DIR/SAagent status
Checking if SA Agent is already running...Yes
SA Agent: GPL=012-000-000 : mem= 5176 kbytes : pcpu = 0.0 % TOTAL
QUERIES=0 : TOTAL TNs=0
```

THERE ARE CURRENTLY NO SERVICE ASSURANCE ASSOCIATIONS

## Files

[Table A-28](#) shows the files for the SAagent command.

**Table A-27 Files: SAagent**

| Filename | Type               | Location          |
|----------|--------------------|-------------------|
| sa.cfg   | Configuration file | \$LSMS_DIR/config |

## Command Usage

[A-29](#) gives several examples of typical command usage sequence.

**Table A-28 SAagent Command Usage**

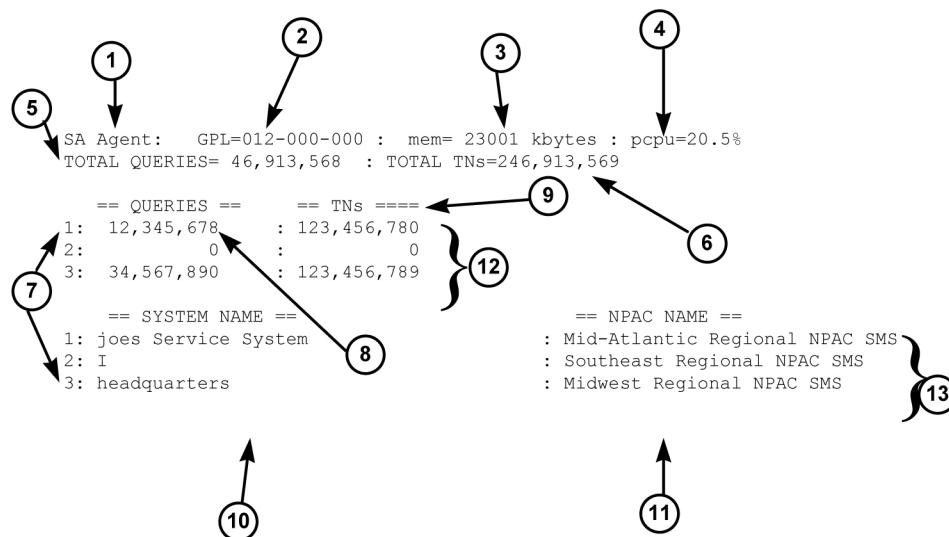
| Case | Action                                                                                                                  | Command Sequence                                           |
|------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| 1    | Start the process.                                                                                                      | \$LSMS_DIR/SAagent<br>start                                |
| 2    | Stop the process, allow<br>Surveillance to restart it.                                                                  | \$LSMS_DIR/SAagent stop                                    |
| 3    | Stop the process but keep<br>Surveillance or the user from<br>starting it. This case assumes it<br>was already started. | \$LSMS_DIR/SAagent stop<br>inhibit                         |
| 4    | Start the process after it was<br>stopped as in Case #3.                                                                | \$LSMS_DIR/SAagent<br>allow<br>\$LSMS_DIR/SAagent<br>start |

### Understanding Status Output

The association status shows each association established for that pairing. The association is designated with a number (1..4) in the left-most column. The number is a tag to coordinate with the statistics that precede the association status.

Figure A-1 shows an example in which there are three active associations. The first is handling 10 TNs per query, the second is associated but no traffic has been sent across the interface, and the third is handling an average of 3.5 TNs per query.

**Figure A-1 Example of SA Agent Status Output**



The following numbered items correspond to the numbers in Figure A-1:

1. Name of the process (**SA Agent**)
2. **GPL** number of the **SA Agent** process
3. Number of bytes used by the **SA Agent** process, in kilobytes as decimal number

4. Ratio of the **CPU** time used by the **SA** Agent to the **CPU** time available during the same time period
5. Total number of queries received by the **SA** Agent since it was last started
6. Total number of **TNs** in the queries
7. Tag that correlates the association statistics to the System Name and the **NPAC** database to which it is connected. Only the systems that are currently associated are shown
8. Total number of queries received by the **SA** Agent on that association since the association was established
9. Total number of **TNs** received by the **SA** Agent on that association since the association was established
10. SystemName of **SA** Manager
11. InpNPAC-SMS-Name
12. **Association** statistics block. Values of zero indicate that no queries or **TNs** have been sent across the association.
13. **Association** status

The examples below show the status as the user sees it when the **SA** Agent is in various conditions. [Figure A-2](#) shows the **SA** Agent running without any associations.

**Figure A-2 Example -- No Associations Status Output**

```
Checking if SA Agent is running....Yes.

SA Agent: GPL=012-000-000 : mem= 5176 kbytes : pcpu = 0.0 %
TOTAL QUERIES=0 : TOTAL TNs=0

THERE ARE CURRENTLY NO SERVICE ASSURANCE ASSOCIATIONS

```

[Figure A-3](#) shows example output that indicates that the **SA** Agent was inhibited after it was started.

**Figure A-3 Example -- Marked Inhibited Status Output**

```
SA agent : is inhibited.
Checking if SA Agent is running....Yes.

SA Agent: GPL=012-000-000 : mem= 5176 kbytes : pcpu = 0.1 %
TOTAL QUERIES=0 : TOTAL TNs=0

THERE ARE CURRENTLY NO SERVICE ASSURANCE ASSOCIATIONS

```

[Figure A-4](#) shows example output that indicates that the **SA** Agent is inhibited and has active associations.

**Figure A-4 Example -- Active Associations Status Output**

```
SA agent : is inhibited.
Checking if SA Agent is running....Yes.

SA Agent: GPL=012-000-000 : mem= 6904 kbytes : pcpu = 0.6 %
TOTAL QUERIES=16 : TOTAL TNs=15

 == QUERIES == == TNs ==
1: 4 : 4
2: 4 : 4
3: 4 : 3
4: 4 : 4

 == SYSTEM NAME == == NPAC NAME ==
0: SAM1 : Midwest Regional NPAC SMS
1: SAM2 : Southeast Regional NPAC SMS
2: SAM3 : Southwest Regional NPAC SMS
3: SAM4_12345678901234567890123456789012345 : West Regional NPAC SMS
```

### Response Notes

It takes 15 seconds to start the **SA** agent. If the **SA** agent is not running, the results of a status request will not appear for at least five seconds.

### Possible Errors

**Table A-29 Error Messages: SAagent**

| Exit Code | Message                           | Cause                                                                  | Suggested Recovery         |
|-----------|-----------------------------------|------------------------------------------------------------------------|----------------------------|
| 4         | bind: <i>errmsg</i>               | The bind command failed. <i>errmsg</i> is the error message.           | Contact My Oracle Support. |
| 3         | SA Agent:<br>executable missing   | <b>sacw</b> executable could not be found                              | Contact My Oracle Support. |
| 1         | SA Agent: Failed to start         | Start action failed                                                    | Contact My Oracle Support. |
| 1         | SA Agent: Failed to stop SA Agent | Stop action failed                                                     | Contact My Oracle Support. |
| 2         | SA Agent: is already allowed      | Allow action failed since <b>SA</b> Agent is already in Allow state    | No action necessary.       |
| 3         | SA Agent: is already inhibited    | Inhibit action failed because the <b>SA</b> Agent is already inhibited | No action necessary.       |
| 2         | SA Agent is already started       | Could not start <b>SA</b> Agent since it is already executing          | No action necessary.       |

**Table A-29 (Cont.) Error Messages: SAagent**

| Exit Code | Message                                                             | Cause                                                          | Suggested Recovery                                              |
|-----------|---------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------|
| 2         | SA Agent is not running                                             | Status or stop performed when <b>SA</b> Agent was not running  | No action necessary.                                            |
| 3         | <b>SA</b> Agent: log directory \$logdir does not exist              | Logfile directory does not exist                               | Contact My Oracle Support.                                      |
| 3         | SA Agent: LSMS_DIR is not defined                                   | <b>LSMS_DIR</b> environment variable not set                   | Verify the environment variables.                               |
| 3         | SA Agent: Permission Denied                                         | Cannot start <b>SA</b> Agent because it has been inhibited     | Perform <code>SAagent allow</code> and then retry this command. |
| 4         | socket: <i>errmsg</i>                                               | The socket command failed. <i>errmsg</i> is the error message. | Contact My Oracle Support.                                      |
| 3         | Usage: SAagent<br>[ status   start  <br>stop   inhibit  <br>allow ] | Invalid action specified                                       | Try the command again using the correct syntax.                 |

## A.2.19 savelogs

### Save logs

Enables you to capture LSMS system logs for debugging purposes.

When this command is issued on the LSMS console, an alarm (event number 8110) is raised on the LSMS GUI, followed by alarm/event number 8111 after the logs are successfully captured. Savelogs files are generated in bz format in the savelogs directory, which is in the LSMS free directory.

### Keyword

savelogs

### Permission

The user must be root.

### Syntax

```
savelogs -n days {-f} {-x [activity]:[cmip]:[ems]:[npac]}
```

### Options

#### -n days

The `-n` option is required.

#### -f

`-f` stands for force and is optional.

**-x [activity] : [cmip] : [ems] : [npac]**

-x stands for exclude and is optional. For -x ems or -x npac, only the transaction logs are excluded; otherwise, all logs are captured.

## A.2.20 service mysql status

### Check MySQL Status

Enables you to check the status of the MySQL database.

### Keyword

service mysql status

### Permission

The user must be root.

### Syntax

# service mysql status

### Options

None.

### Sample Output

```
[lsmsadm@lsmspri etc]$ su - root
Password:
[root@lsmspri ~]#
[root@lsmspri ~]#
[root@lsmspri ~]# service mysql status
MySQL running (5089) [OK]
[root@lsmspri ~]#
```

## A.2.21 spidsec

### Authorize Users to Access SPIDs

When the **SPID** Security feature is enabled, this command allows a user logged in as `lsmsadm` to associate specified users to access data belonging to specified Service Provider **ID (SPID)**.

### Keyword

spidsec

### Permission

The user must be logged in with the user name `lsmsadm`.

### Syntax

\$LSMS\_TOOLS\_DIR/spidsec [-h] [-a -r -d] -u <user> -s{<spid>|GOLDEN}

## Required Flags

**-u <user>**

Specify a username that has already been defined on the **LSMS** (see [Managing User Accounts](#)).

**-s {<spid>|GOLDEN}**

Specify a **SPID** that has been defined (for more information, refer to the *Configuration Guide*) or specify **GOLDEN** to apply to all defined **SPIDs**.

**One of the following options must be specified:**

**-a**

Authorize user for the specified **SPID**.

**-d**

Display user's authorization information.

**-r**

Remove **SPID** authorization from given user (optionally specify a username with the **-u** flag; if no username is specified, all usernames that have been defined on the **LSMS** are displayed).

## Sample Output

```
Display the SPID security for the username lsmsadm
$ spidsec -d -u lsmsadm
```

```
lsmsadm GOLDEN
```

```
Authorize the username thomas to access the SPID TKLC
$ spidsec -a -u thomas -s TKLC
```

No output is displayed.

```
Display the SPID security for all usernames
$ spidsec -d
```

```
lsmsadm GOLDEN
lsmsall GOLDEN
lsmsuser GOLDEN
lsmsuext GOLDEN
lsmsview GOLDEN
```

```
thomas TKLC
```

## Related Commands

None.

## Possible Errors

**Table A-30 Exit Codes: spidsec**

| Exit Code | Cause                  | Suggested Recovery                    |
|-----------|------------------------|---------------------------------------|
| -1        | Usage error.           | Correct the syntax.                   |
| 1         | File access error.     | Contact My Oracle Support.            |
| 2         | <b>Database</b> error. | Contact My Oracle Support.            |
| 3         | Invalid user.          | Change user to <code>lsmsadm</code> . |
| 4         | Unknown error.         | Contact My Oracle Support.            |

This command is usually run by scripts; scripts should search for exit codes. When the command is run from the command line, the output indicates suggested recovery.

## A.2.22 sup

### Control of Local Services Manager and Local Data Manager

Used to start, stop, or display status of the Local Services Manager (`lsman`) and Local Data Manager (`supman`).

#### Keyword

`sup`

#### Permission

The user must be logged in with the user name `lsmsadm`.

#### Syntax

`$LSMS_DIR/sup <Action>`

#### Options

None.

#### Parameters

##### Action

The function to be performed on the `lsman` and `supman` processes. This mandatory parameter has the following values:

```
start
stop
status
```

#### Sample Output

```
Stop the lsman and supman currently running
```



```
$ $LSMS_DIR/sup stop

supman stopped
lsman stopped
Restart the lsman and supman

$ $LSMS_DIR/sup start
This command has no output.

Check the status of the lsman and supman

$ $LSMS_DIR/sup status

0 reports in progress
0 LNP database synchronization operations in progress
6 GUIs connected
lsman: mem= 23480 kbytes : pcpu = 0.1 %
supman: mem= 41216 kbytes : pcpu = 0.2 %
reportma: mem= 14072 kbytes : pcpu = 0.1 %
```

### Possible Errors

**Table A-31 Exit Codes: sup**

| Exit Code | Cause        | Suggested Recovery  |
|-----------|--------------|---------------------|
| 1         | Usage error. | Correct the syntax. |

This command is usually run by scripts; scripts should search for exit codes. When the command is run from the command line, the output indicates suggested recovery.

## A.2.23 sup\_db\_setup

### Supplemental Database Setup

Creates or removes the supplemental database.



#### Note:

See “[Special Procedure to Remove EMSs from Shared Memory](#)” for information about removing **EMSs** from shared memory when removing supDB.

### Keyword

sup\_db\_setup

### Permission

The user must be logged in with the user name `lsmsadm`.

## Syntax

```
$LSMS_DIR/sup_db_setup <Action>
```

This command must be executed from the **\$LSMS\_DIR** and must be run on the both servers. The operator must respond to a prompt to verify removal or creation of the database when a version already exists.

## Options

None.

## Parameters

### Action

The function to be performed on the database. This mandatory parameter has the following values:

create

remove

## Sample Output

To create a new Supplemental **Database**:

```
$ $LSMS_DIR/sup_db_setup create
```

```

Supplemental Database Setup Script The Supplemental Database name is supDB
Initializing Supplemental Database...supDB
The supplemental database supDB was created successfully.
```

To remove the current Supplemental **Database**

```
$ $LSMS_DIR/sup_db_setup remove
```

```

Supplemental Database Setup Script
WARNING: Supplemental Database supDB is about to be removed.
 All data in this database will be lost.
 Do you want to continue? [Y/N] Y
Removing Supplemental Database...supDB
$
```

## Response Notes

The create action requires 20 or more seconds to create the database and respond.

## Possible Errors

**Table A-32 Error Messages: sup\_db\_setup**

| Exit Code | Cause                | Suggested Recovery  |
|-----------|----------------------|---------------------|
| 1         | Syntax was incorrect | Use correct syntax. |

Table A-32 (Cont.) Error Messages: sup\_db\_setup

| Exit Code | Cause                                                   | Suggested Recovery                                                 |
|-----------|---------------------------------------------------------|--------------------------------------------------------------------|
| 2         | MySQL command failed                                    | Contact Oracle.                                                    |
| 7         | User attempted to create a database that already exists | None needed.                                                       |
| 9         | User attempted to remove a database that is in use      | Stop indicated processes before attempting to remove the database. |
| 10        | The root user cannot execute this command               | Change users to lsmsadm.                                           |

### Special Procedure to Remove EMSs from Shared Memory



#### Note:

Beginning with **LSMS** Release 6.0, Sentry information for **LSMS** processes is stored in shared memory, not the database. As a result, use of the `sup_db_setup` command to remove the supDB leaves Sentry in the state that it still monitors/restarts EagleAgents for **EMS** that were previously defined in the supDB. Therefore, Sentry will continually attempt to restart the EagleAgents for these **EMS**'s and will continue to display their status. To eliminate this problem, perform the following procedure:

#### Procedure:

1. Delete all **EMS** Components using the **LSMS GUI**. (For more information, refer to the *Configuration Guide*, Chapter 3, "Deleting an **EMS** Configuration Component.")
2. Deactivate all **NPAC** Regions using the **LSMS GUI**. (For more information, refer to the *Configuration Guide*, Chapter 3, "Modifying **LSMS** Configuration Components.")
3. Shutdown the **LSMS** using Sentry. Log in to the active server as `root`, and execute the `sentry shutdown` command:

```
sentry shutdown
```

4. Delete the supDB. Log in to the active server as `lsmsadm`, and execute the `sup_db_setup remove` command:

```
$ $LSMS_DIR/sup_db_setup remove
```

You have now completed this procedure.

## A.2.24 survNotify

### Surveillance Notification Command

Use this command to send a customer-defined notification.

#### Keyword

`survNotify`

## Permission

The user must be defined as a member of the primary group `lsms`.

## Syntax

```
$LSMS_DIR/survNotify <MsgNo> SET <Text>
```

## Options

None.

## Parameters

### MsgNo

Unique identifier for a customer-defined message. When the `Action` parameter has the value `SET`, this parameter is mandatory and must have a value in the range 9000-9999. When the `Action` parameter has any value other than `SET`, this parameter is not allowed.

### SET

Send a surveillance notification which has the number specified by the `MsgNo` parameter and the text specified by `Text` parameter.

### Text

The message text for a customer-defined notification. This parameter can contain up to 39 characters. If the text contains spaces, the text should begin and end with a double quote character. This parameter is optional.

## Sample Output

```
Notify the Surveillance Monitor that a new customer-defined event has
occurred
$ $LSMS_DIR/survNotify 9001 SET "Job completed"
```

Response Notes

This command has no output other than the prompt.

## Possible Errors

**Table A-33 Exit Codes: survNotify**

| Exit Code                                                                                                                                                             | Cause                       | Suggested Recovery                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------------|
| 1                                                                                                                                                                     | Socket open error.          | Contact My Oracle Support.         |
| 2                                                                                                                                                                     | Usage error.                | Correct the syntax.                |
| 3                                                                                                                                                                     | Unknown operation argument. | Supply a valid operation argument. |
| This command is usually run by scripts; scripts should search for exit codes. When the command is run from the command line, the output indicates suggested recovery. |                             |                                    |

## A.2.25 syscheck

### Check System Health

Detects, diagnoses, and displays a summary of the overall health of the **LSMS**.

### Keyword

`syscheck`

### Permission

The user must be `root`.

### Syntax

The `syscheck` command resides in the `/usr/TKLC/plat/bin` directory. Use only the syntax specified in procedures in this manual. For all other uses, contact My Oracle Support..

### Additional Information

For additional information about the `syscheck` command, access the man page from the **LSMS** by typing the following:

```
man syscheck
```

# B

## Automatic Monitoring of Events

This appendix contains overviews of monitored events, GUI and surveillance notifications, and traps.

### B.1 Introduction

This appendix contains:

- [“Overview of Monitored Events”](#), which describes how the **LSMS** monitors itself for events and alarms and how it reports them.
- [“Overview of GUI Notifications”](#), which describes the display, format, and logging of notifications that appear on the graphical user interface.
- [“Overview of Surveillance Notifications”](#), which describes the display, format, and logging of Surveillance notifications.
- [“Overview of Traps”](#), which describes the transmission, format, and logging of **SNMP traps**.
- A listing of all events, in numerical order, starting on page B-18. For each event, this appendix includes:
  - Explanation of the probable cause for the event
  - Suggested recovery
  - Indication of whether the event results in a **GUI** notification, Surveillance notification, *trap*, or some combination of these.

### B.2 Overview of Monitored Events

This section describes:

- [Types of Events and Alarms Reported](#)
- [How Servers Report Alarms and Events](#)

#### Types of Events and Alarms Reported

The **LSMS** monitors itself for the types of events and alarms shown in [Table B-1](#) . When one of these events occurs, the **LSMS** does one or more of the following:

- Displays a notification on the graphical user interface (**GUI** notification)
- Posts a Surveillance notification at a certain frequency to the administration console by default, or to the second serial port if so configured
- Sends a *trap* to a Network Management System (**NMS**) if you have installed the optional Remote Monitoring feature

Every **GUI** notification and Surveillance notification contains its associated event number. Traps contain a trap **ID**, which is explained in [Overview of Traps](#).

**Table B-1 Notification Event Number Categories**

| Event Number Range | Category                                                                               | Description                                                                                                                                                                                   |
|--------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0000–1999          | <b>EMS</b>                                                                             | Events that pertain to an Element Management System ( <b>EMS</b> ). The <b>EMS</b> is a process that runs on the <b>Multi-Purpose Server (MPS)</b> at a network element.                      |
| 2000–3999          | <b>NPAC</b>                                                                            | Events that pertain to a Number Portability Administration Center ( <b>NPAC</b> )                                                                                                             |
| 4000–5999          | Platform and switchover (some of these events do not produce <b>GUI</b> notifications) | Events that pertain to system resources, such as disks, hardware, memory, central processing unit ( <b>CPU</b> ) utilization and to switchover functions                                      |
| 6000–7999          | Main <b>LSMS</b> processes                                                             | Events that pertain to one of the following main <b>LSMS</b> processes: <code>lsman</code> , <code>supman</code> , <code>npacagent</code> , or <code>eagleagent</code>                        |
| 8000–8999          | Applications                                                                           | Events that pertain to <b>LSMS</b> applications that are feature or application dependent, such as <b>LNP Database</b> Synchronization, Service Assurance, or <b>NPA</b> Split Administration |

### How Servers Report Alarms and Events

The **LSMS** 9.0 servers perform the following functions to monitor and report events:

- The standby server:
  - Monitors itself only for:
    - \* Platform events (see [Platform Alarms](#))
    - \* Switchover-readiness events, such as those that describe database replication or critical network interfaces
  - Controls the appropriate **AlarmLED** (Critical, Major, or Minor) on the front of the server by illuminating the **LED** when one or more platform alarm in that category exists and turning off the **LED** when no platform alarms in that category exist
  - Sends any notification to its Serial Port 3 and logs the notification in its Surveillance log
  - Sends the notification to the active server
- The active server performs the following functions:
  - Monitors itself for both platform events and application events
  - Controls the appropriate **AlarmLED** (Critical, Major, or Minor) on the front of the server by illuminating the **LED** when one or more platform alarm in that category exists and turning off the **LED** when no platform alarms in that category exist
  - Sends all platform events for itself, events reported from the standby server, and appropriate application events for itself to its Serial Port 3 and also logs the event as appropriate in its Surveillance log (some event notifications are reported repeatedly;

for more information about which events are reported repeatedly, see the individual event descriptions)

- \* Alarms that originate from the active server contain the alarm text with no hostname
- \* Alarms that originate from the standby server contain the alarm text preceded by the standby server's hostname

#### Note:

Although all events are reported through **SNMP** traps and all platform alarms are reported through Surveillance notifications, not all application alarms are reported both through the **GUI** and through Surveillance notifications; for more information about which alarms are reported in which way, see the individual event descriptions.

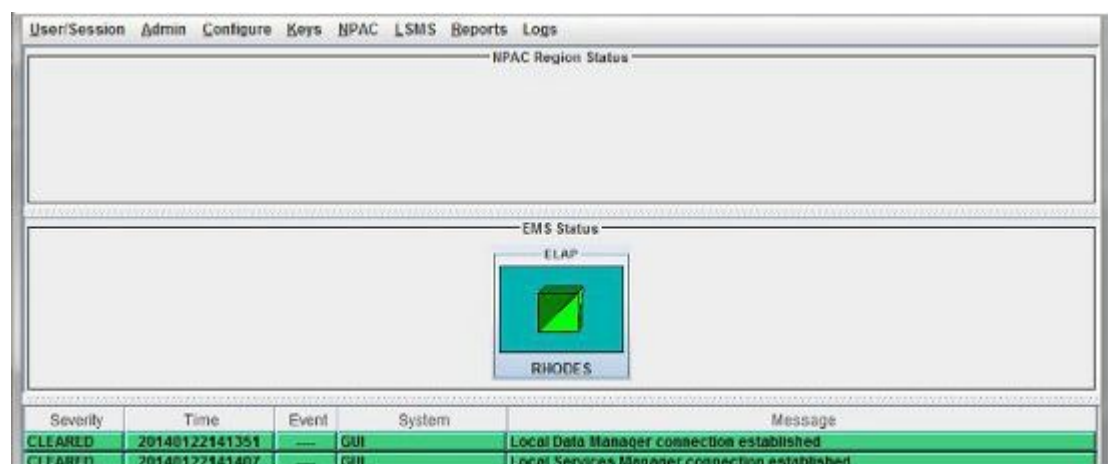
- Displays one time on the **GUI** each platform or application event for itself and each platform event received from the standby server:
  - \* Alarms that originate from the active server display the alarm text with no hostname
  - \* Alarms that originate from the standby server display the alarm text preceded by the standby server's hostname
- Sends one **Simple Network Management Protocol (SNMP)** trap for each platform or application event for itself and for each platform event received from the standby server. Each trap contains the **IP** address of the server from which the notification originated.

## B.3 Overview of GUI Notifications

### Displaying GUI Notifications

**GUI** notifications are displayed on the **GUI** only if the **GUI** is active when the reported event occurs, but all **GUI** notifications are logged in an appropriate log as described in [Logging GUI Notifications](#). [Figure B-1](#) shows an example of notifications displayed on the **GUI**.

**Figure B-1 GUI Notifications**



| Severity | Time           | Event | System | Message                                       |
|----------|----------------|-------|--------|-----------------------------------------------|
| CLEARLD  | 20140122141351 | ---   | GUI    | Local Data Manager connection established     |
| CLEARLD  | 20140122141407 | ---   | GUI    | Local Services Manager connection established |

The screenshot shows a GUI window with a menu bar (User/Session, Admin, Configure, Keys, NPAC, LSMS, Reports, Logs) and a title bar (NPAC Region Status). Below the menu bar is a large empty area. At the bottom, there is a table with the data shown above. To the right of the table, there is a status indicator labeled 'EMS Status' with a sub-label 'ELAP' and a green square icon labeled 'RHODES'.



## B.3.1 Format of GUI Notifications

This section describes the general format used for most **GUI** notifications, as well as additional fields used for **GUI** event notifications (used to report information only) and for **EMS GUI** notifications. The formats are expressed as an ordered sequence of variables. Variables are expressed with the name of the variable enclosed by angle brackets; for example, <Severity> indicates a variable for the severity assigned to a **GUI** notification. [Variables Used in GUI Notification Format Descriptions](#) shows the variables used in **GUI** notification formats.

### General Format for GUI Notifications

The format for most **GUI** notifications is:

```
[<Severity>]:<Time Stamp> <Event Number> <Message Text String>
```

In addition, the following types of **GUI** notifications contain additional fields:

- **EMS GUI** notifications contain information about the **EMS** for which they are reporting status (see [Format for EMS GUI Notifications](#))
- Notifications that have the severity **EVENT** can contain additional event data fields (see [Format for GUI Notifications with EVENT Severity](#))

### Format for EMS GUI Notifications

**EMS GUI** notifications (event numbers in the range 0000–1999) contain a <CLLI> value to indicate the **Common Language Location Identifier** for the network element where the **EMS** resides. The format for **EMS GUI** notifications is:

```
[<Severity>]:<Time Stamp> <Event Number> <CLLI>: <Message Text String>
```

### Format for GUI Notifications with EVENT Severity

Notifications that have the severity **EVENT** can contain additional event data fields. The format for **GUI** notifications with severity **EVENT** is:

```
[EVENT]:<Time Stamp> <Event Number> <EventType>:<EventData1>,
[<EventData2>],...
```

## B.3.1.1 Variables Used in GUI Notification Format Descriptions

[Table B-2](#) shows the possible values and meanings for each of the variables shown in format definitions for **GUI** notifications.

**Table B-2 Variables Used in GUI Notifications**

| Field      | Description                                                            |
|------------|------------------------------------------------------------------------|
| <Severity> | Indicates seriousness of event, using both text and color, as follows: |
|            | Text                      Color                      Meaning           |

**Table B-2 (Cont.) Variables Used in GUI Notifications**

| Field                                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |                                                                                                                                           |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------|
|                                                          | [Critical]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Red       | Reports a serious condition that requires immediate attention                                                                             |
|                                                          | [Major]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Yellow    | Reports a moderately serious condition that should be monitored, but does not require immediate attention                                 |
|                                                          | [Minor]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Turquoise | Reports a condition of minor significance that should be monitored, but which does not require immediate attention.                       |
|                                                          | [Cleared]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Green     | Reports status information or the clearing of a condition that caused previous posting of a [Critical] or [Major] <b>GUI</b> notification |
|                                                          | [EVENT]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | White     | For information only                                                                                                                      |
| <Time Stamp>                                             | Indicates time that the event was detected, in format: <b>YYYY-MM-DD hh:mm:ss</b> where fields are as follows:                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                                                                                                                                           |
|                                                          | Field                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Meaning   | Possible Values                                                                                                                           |
|                                                          | YYYY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Year      | Any four digits                                                                                                                           |
|                                                          | MM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Month     | 01 through 12                                                                                                                             |
|                                                          | DD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Day       | 01 through 31                                                                                                                             |
|                                                          | hh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Hour      | 00 through 23                                                                                                                             |
|                                                          | mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Minute    | 00 through 59                                                                                                                             |
|                                                          | ss                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Second    | 00 through 59                                                                                                                             |
| <Event Number>                                           | Four-digit number that identifies the specific <b>GUI</b> notification (also indicates the type of <b>GUI</b> notification, as shown in <a href="#">Table B-1</a> ).                                                                                                                                                                                                                                                                                                                                                                               |           |                                                                                                                                           |
| <Message Text String>                                    | Text string (which may contain one or more variables defined in <a href="#">Table B-3</a> ) that provides a small amount of information about the event. For more information about the event, look up the corresponding event number in this appendix; for each event number, this appendix shows the text string as it appears in a <b>GUI</b> notification, as well as a more detailed explanation and suggested recovery.                                                                                                                      |           |                                                                                                                                           |
| <CLLI>                                                   | Used in all <b>EMS GUI</b> notifications to indicate the <b>Common Language Location Identifier</b> for the network element where the <b>EMS</b> resides.                                                                                                                                                                                                                                                                                                                                                                                          |           |                                                                                                                                           |
| <EventType>:<br><EventData1>,<br>[<EventData2>], .<br>.. | Optional event data fields, as indicated by square brackets around the field, included in <b>GUI</b> notifications with severity [EVENT] . If no data is available for a given field, the field is empty. If other fields follow an empty field, the empty field is indicated by consecutive commas with no intervening data. One of the optional fields in an event notification is an effective timestamp field. This field indicates the time that the event actually occurred. When present, it uses the <b>ASN.1</b> Generalized Time format. |           |                                                                                                                                           |

## B.3.2 Variables Used in Message Text String of GUI Notifications

[Table B-3](#) shows the variables that can appear in the message text of a **GUI** notification.

**Table B-3 Variables Used in Message Text of GUI Notifications**

| Symbol                | Possible Values and Meanings                                                                           | Number of Characters |
|-----------------------|--------------------------------------------------------------------------------------------------------|----------------------|
| <PRIMARY   SECONDARY> | <b>PRIMARY</b> =Primary <b>NPAC</b><br><b>SECONDARY</b> =Secondary <b>NPAC</b>                         | 7 or 9               |
| <retry_interval>      | Time, in minutes, between retries of a request sent to an <b>NPAC</b> after it sent a failure response | 1-10                 |
| <retry_number>        | Number of times the <b>LSMS</b> will retry to recover from a failure response sent by <b>NPAC</b>      | 1-10                 |
| <YYYYMMDDhhmmss>      | Year, month, day, hour, minute, second                                                                 | 14                   |
| <NPAC_region_ID>      | <b>CA</b> = Canada                                                                                     | 2                    |
|                       | <b>MA</b> = MidAtlantic                                                                                |                      |
|                       | <b>MW</b> = Midwest                                                                                    |                      |
|                       | <b>NE</b> = Northeast                                                                                  |                      |
|                       | <b>SE</b> = Southeast                                                                                  |                      |
|                       | <b>SW</b> = Southwest                                                                                  |                      |
|                       | <b>WE</b> = Western                                                                                    |                      |
|                       | <b>WC</b> = WestCoast                                                                                  |                      |

## B.3.3 Examples of GUI Notifications

### Example of General Format GUI Notifications

Following is an example of a general **GUI** notification (for a description of its format, see [General Format for GUI Notifications](#)):

```
[Critical]:1998-07-05 11:49:56 2012 NPAC PRIMARY-NE Connection Attempt Failed:
Access Control Failure
```

### Example of an EMS GUI Notification

Following is an example of an **EMS GUI** notification (for a description of its format, see [Format for EMS GUI Notifications](#)). In this example, <CLLI> has the value LNPBUICK:

```
[Critical]:1998-07-05 11:49:56 0003 LNPBUICK: Primary Association Failed
```

### Example of GUI Notification with EVENT Severity Level

Following is an example of a **GUI** notification with severity [EVENT]. For a description of its format, see [Format for GUI Notifications with EVENT Severity](#):

```
[EVENT]: 2000-02-05 11:49:56 8069 LNPBUICK: Audit LNP DB Synchronization
Aborted
```

## B.3.4 Logging GUI Notifications

When an event that generates a **GUI** notification occurs, that notification is logged in the file created for those events. [Table B-4](#) shows the types of log files used for each of these file names, where <mmdd> indicates the month and day the event was logged.

**Table B-4** Logs for GUI Notifications

| Event Type                                                     | Log File                                                                                                                             |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| EMS Alarms,<br>NPAC Alarms, and<br>Main LSMS<br>Process Alarms | /var/TKLC/lsmc/logs/alarm/LsmcAlarm.log.<mmdd>                                                                                       |
| Non-alarm Events                                               | /var/TKLC/lsmc/logs/<region>/LsmcEvent.log.<mmdd>, where<br><region> indicates the region of the NPAC that generated the information |

For information about the format of the logs and how to view the logs, refer to the *Database Administrator's Guide*.

## B.4 Overview of Surveillance Notifications

Surveillance notifications are created by the Surveillance feature. These notifications can report status that is not available through the **GUI** notifications and report status that can be monitored without human intervention.

### Displaying Surveillance Notifications

Surveillance notifications are sent to Serial Port 3 on each server.

### Format of Surveillance Notifications

All Surveillance notifications reported on the same server where the event occurred have the following format:

```
<Event Number>|<Time Stamp>|<Message Text String>
```

Surveillance notifications that originated from the non-active server and are reported on the active server where the event occurred have an additional field that shows the hostname of the server where the event occurred, as shown in the following format:

```
<Event Number>|<Time Stamp>|<Host Name>|<Message Text String>
```

## B.4.1 Variables Used in Surveillance Notification Format Descriptions

[Table B-5](#) shows the possible values and meanings for each of the variables shown in format definition for Surveillance notifications.

**Table B-5 Variables Used in Surveillance Notifications**

| Field                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                     |                                     |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------|-----------------|----|------|---------------|----|--------|---------------|-----|-------|-------------------------------------|----|-----|---------------|------|------|-----------------|
| <Event Number>        | Four-digit number that identifies the specific Surveillance notification and also indicates the type of Surveillance notification, as shown in <a href="#">Table B-2</a> .                                                                                                                                                                                                                                                      |                                     |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |
| <Time Stamp>          | Indicates time that the event was detected, in format:<br>hh:mm Mon DD, YYYY where fields are as follows:                                                                                                                                                                                                                                                                                                                       |                                     |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |
|                       | <table><tr><th>Field</th><th>Meaning</th><th>Possible Values</th></tr><tr><td>hh</td><td>Hour</td><td>00 through 23</td></tr><tr><td>mm</td><td>Minute</td><td>00 through 59</td></tr><tr><td>Mon</td><td>Month</td><td>First three letters of month's name</td></tr><tr><td>DD</td><td>Day</td><td>01 through 31</td></tr><tr><td>YYYY</td><td>Year</td><td>Any four digits</td></tr></table>                                  | Field                               | Meaning | Possible Values | hh | Hour | 00 through 23 | mm | Minute | 00 through 59 | Mon | Month | First three letters of month's name | DD | Day | 01 through 31 | YYYY | Year | Any four digits |
| Field                 | Meaning                                                                                                                                                                                                                                                                                                                                                                                                                         | Possible Values                     |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |
| hh                    | Hour                                                                                                                                                                                                                                                                                                                                                                                                                            | 00 through 23                       |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |
| mm                    | Minute                                                                                                                                                                                                                                                                                                                                                                                                                          | 00 through 59                       |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |
| Mon                   | Month                                                                                                                                                                                                                                                                                                                                                                                                                           | First three letters of month's name |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |
| DD                    | Day                                                                                                                                                                                                                                                                                                                                                                                                                             | 01 through 31                       |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |
| YYYY                  | Year                                                                                                                                                                                                                                                                                                                                                                                                                            | Any four digits                     |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |
| <Host Name>           | First seven letters of the name of the host (one of two redundant servers) that noted the event. (In addition, the documentation of the individual event includes information about whether the event is reported by the active server or inactive server, or both servers.)                                                                                                                                                    |                                     |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |
| <Message Text String> | Text string (which may contain one or more variables defined in <a href="#">Table B-6</a> ) that provides a small amount of information about the event. For more information about the event, look up the corresponding event number in this appendix; for each event number, this appendix shows the text string as it appears in a Surveillance notification, as well as a more detailed explanation and suggested recovery. |                                     |         |                 |    |      |               |    |        |               |     |       |                                     |    |     |               |      |      |                 |

## B.4.2 Variables Used in Message Text String of Surveillance Notifications

[Table B-6](#) shows the variables that can appear in the message text of a Surveillance notification.

**Table B-6 Variables Used in Message Text of Surveillance Notifications**

| Symbol                | Possible Values and Meanings                                       | Number of Characters |
|-----------------------|--------------------------------------------------------------------|----------------------|
| <CLLI>                | <b>Common Language Location Identifier</b> for the network element | 11                   |
| <PRIMARY   SECONDARY> | PRIMARY=Primary <b>NPAC</b><br>SECONDARY=Secondary <b>NPAC</b>     | 7 or 9               |

**Table B-6 (Cont.) Variables Used in Message Text of Surveillance Notifications**

| Symbol                           | Possible Values and Meanings                                         | Number of Characters |
|----------------------------------|----------------------------------------------------------------------|----------------------|
| <NPAC_cust_ID>                   | 0000 = Midwest                                                       | 4                    |
|                                  | 0001 = MidAtlantic                                                   |                      |
|                                  | 0002 = Northeast                                                     |                      |
|                                  | 0003 = Southeast                                                     |                      |
|                                  | 0004 = Southwest                                                     |                      |
|                                  | 0005 = Western                                                       |                      |
|                                  | 0006 = WestCoast                                                     |                      |
|                                  | 0008 = Canada                                                        |                      |
| <NPAC_IP_Address>                | <b>IP</b> address of the <b>NPAC</b>                                 | 10                   |
| <process_name>                   | First 12 characters of process name                                  | 12                   |
| <region>                         | Midwest                                                              | 6 to 12              |
|                                  | MidAtlantic                                                          |                      |
|                                  | Northeast                                                            |                      |
|                                  | Southeast                                                            |                      |
|                                  | Southwest                                                            |                      |
|                                  | Western                                                              |                      |
|                                  | WestCoast                                                            |                      |
|                                  | Canada                                                               |                      |
| <return_code>                    | Return code                                                          | 1 or 2               |
| <Service_Assurance_Manager_name> | System name of machine that implements the Service Assurance Manager | 12                   |
| <volume_name>                    | Name of disk volume, for example:<br>a01                             | 3                    |
| <volume_name_of_disk_partition>  | Name of disk volume, for example:<br>a01                             | 3                    |

### B.4.3 Example of a Surveillance Notification

Following is an example of a Surveillance notification:

```
LSMS8088|14:58 Mar 10, 2000|lsmspri|Notify: sys Admin - Auto Xfer Failure
```

### B.4.4 Logging Surveillance Notifications

In addition to displaying Surveillance notifications, the Surveillance feature logs all Surveillance notifications in the file `survlog.log` in the `/var/TKLC/lsms/logs` directory.

If the **LSMS** Surveillance feature becomes unable to properly report conditions, it logs the error information in a file, named `lsmsSurv.log`, in the `/var/TKLC/lsms/logs` directory on each server's system disk. When the size of `lsmsSurv.log` exceeds 1MB, it is copied to a backup file, named `lsmsSurv.log.bak`, in the same directory. There is only one **LSMS** Surveillance feature backup log file, which limits the amount of log disk space to approximately 2MB.

## B.5 Overview of Traps

The optional Remote Monitoring feature provides the capability for the **LSMS** to report certain events and alarms to a remote location, using the industry-standard **Simple Network Management Protocol (SNMP)**. The **LSMS** implements an **SNMP** agent.

Customers can use this feature to cause the **LSMS** to report events and alarms to another location, which implements an **SNMP** Network Management System (**NMS**). An **NMS** is typically a standalone device, such as a workstation, which serves as an interface through which a human network manager can monitor and control the network. The **NMS** typically has a set of management applications (for example, data analysis and fault recovery applications).

For more information about the **LSMS** implementation of an **SNMP** agent, see [“Understanding the SNMP Agent Process”](#).

### SNMP Version 3 Trap PDU Format

An SNMPv3 trap PDU consists of the following fields:

- **PDU Type**  
Specifies the type of PDU (in this case, trap).
- **Request ID**  
Used to associate requests with responses.
- **Error Status**  
Specifies an error or error type in response PDUs only (else set to 0)
- **Error Index**  
Associates an error with a particular object instance in response PDUs only (else set to 0)
- **Variable Bindings**  
Each variable binding contains an object field followed by its value field. The object and value fields together specify information about the event being reported.

### SNMP Version 1 Trap PDU Format

Following is an overview of the format of the **SNMP** version 1 *trap* request. For more information about **SNMP** message formats, refer to **SNMP, SNMPv2, SNMPv3, and RMON 1 and 2**, Third Edition, William Stallings, Addison Wesley, ISBN 0-201-48534-6, 1999.

Each **SNMP** message consists of the following fields:

- **SNMP** authentication header, which consists of:
  - Version identifier, used to ensure that both the sender and receiver of the message are using the same version of the **SNMP** protocol. Currently, the **LSMS** supports only version 1, which has a version identifier of 0 (zero).
  - Community name, used to authenticate the **NMS**. The **SNMP** agent uses this field as a password to ensure that the sender of the message is allowed to access the **SNMP** agent's information. The **LSMS** supports only *trap* requests, which originate at the **LSMS**; therefore, this field is not significant.
- Protocol data unit (**PDU**), which for a *trap* request consists of:

An SNMPv1 trap PDU consists of the following fields:

- **PDU Type** field, which specifies the type of PDU (in this case, trap).
- **Enterprise** field, which identifies the device generating the message. For the **LSMS SNMP** agent, this field is 323.

- Agent address field, which contains the **IP** address of the host that runs **SNMP** agent. For the **LSMS SNMP** agent, this field contains the **IP** address of the **LSMS** active server.
- Generic *trap* type, which can be set to any value from 0 through 6. Currently, the **LSMS** supports only the value 6, which corresponds to the *enterpriseSpecific* type of *trap* request.
- Specific *trap* type, which can be used to identify a specific trap.
- Time stamp, which indicates how many hundredths of a second have elapsed since the last reinitialization of the host that runs the **SNMP** agent.
- One or more variables bindings, each of which contains an object field followed by a value field. The object and value fields together specify information about the event being reported.

## B.5.1 Logging SNMP Agent Actions

When the **LSMS SNMP** agent process starts, stops, or sends a *trap* request, it logs information about the action in a log file. The log file is named `lsmsSNMP.log.<MMDD>`, where `<MMDD>` represents the current month and day. The log file is stored in the directory `/usr/TKLC/lsms/logs/snmp`.

Table B-7 shows the actions and information logged by the **LSMS SNMP** agent.

**Table B-7 Information Logged by the LSMS SNMP Agent**

| Action                                            | Information Logged                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The <b>SNMP</b> agent starts                      | <p>Action, followed by day, date, time, and year; for example:</p> <pre>LSMS SNMP agent started: Thu Mar 09 09:02:53 2000</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| The <b>SNMP</b> agent stops                       | <p>Action, followed by day, date, time, and year; for example:</p> <pre>LSMS SNMP agent stopped: Thu Mar 09 15:34:50 2000</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| The <b>SNMP</b> agent sends a <i>trap</i> request | <p>The following fields, delimited by pipe characters:</p> <ul style="list-style-type: none"> <li>• Timestamp, recorded as <b>YYYYMMDDhhmmss</b> (year, month, date, hour, minute, second)</li> <li>• <b>trap_ID</b>, a unique numeric identifier that corresponds to the specific <i>trap</i> request sent.</li> <li>• For each <b>NMS</b> configured (up to five allowed): <ul style="list-style-type: none"> <li>– The <b>NMS's IP</b> address</li> <li>– Status (either of the following): <ul style="list-style-type: none"> <li>* <b>S</b> to indicate that the <b>LSMS SNMP</b> agent succeeded in sending the <i>trap</i> request. (Even if the <b>LSMS SNMP</b> agent successfully sends the <i>trap</i> request, there is no guarantee that the <b>NMS</b> receives it.)</li> <li>* <b>F</b> to indicate that the <b>LSMS SNMP</b> agent failed in sending the <i>trap</i> request.</li> </ul> </li> </ul> </li> </ul> <p>Following is a sample entry logged when a <i>trap</i> is sent (in this entry, a <i>trap</i> with a <b>trap_ID</b> of 3 is sent to two <b>NMSs</b>):</p> <pre>20000517093127 3 10.25.60.33 S 10.25.60.10 S</pre> |



## B.6 Event Descriptions

0001

### Explanation

The **EMS** Ethernet interface has a problem. The `ping` utility did not receive a response from the interface associated with the **EMS**.

### Recovery

Consult with your network administrator.

### Event Details

Table B-8 Event 0001 Details

| GUI Notification          |                                               |
|---------------------------|-----------------------------------------------|
| Severity                  | None                                          |
| Text                      |                                               |
| Surveillance Notification |                                               |
| Text                      | Notify:Sys Admin - EMS interface failure      |
| Source                    | Both servers                                  |
| Frequency                 | Every 2.5 minutes as long as condition exists |
| Trap                      |                                               |
| Trap ID                   | 16                                            |
| Trap MIB Name             | emsInterfaceFailure                           |

0002

### Explanation

The **EMS**, which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces `<CLLI>` in the Surveillance notification text, requires a resynchronization with the **LSMS** that cannot be accomplished by automatic resynchronization between the **LSMS** and the **EMS**.

### Recovery

Perform one of the synchronization procedures described in the *LNP Database Synchronization User's Guide*.

### Event Details

Table B-9 Event 0002 Details

| GUI Notification          |                                  |
|---------------------------|----------------------------------|
| Severity                  | Critical                         |
| Text                      | <b>DB Maintenance Required</b>   |
| Surveillance Notification |                                  |
| Text                      | Notify:Sys Admin - NE CLI=<CLLI> |

**Table B-9 (Cont.) Event 0002 Details**

|               |                                                                                       |
|---------------|---------------------------------------------------------------------------------------|
| Source        | Active server                                                                         |
| Frequency     | As soon as condition occurs, and at five-minute intervals as long as condition exists |
|               | Trap                                                                                  |
| Trap ID       | 33                                                                                    |
| Trap MIB Name | emsRequiresResynchWithLSMS                                                            |

**0003****Explanation**

The **LSMS** has lost association with the primary **EMS** of the network element, which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces <**CLLI**> in the Surveillance notification text; the association with the secondary **EMS** is established.

**Recovery**

Determine why the primary association failed (connectivity problem, **EMS** software problems, **NE** software problem, etc.). Correct the problem. **Association** will be automatically retried.

**Event Details****Table B-10 Event 0003 Details**

|               |                                                                                       |
|---------------|---------------------------------------------------------------------------------------|
|               | <b>GUI Notification</b>                                                               |
| Severity      | Major                                                                                 |
| Text          | Primary Association Failed                                                            |
|               | <b>Surveillance Notification</b>                                                      |
| Text          | Notify:Sys Admin - NE CLLI=<CLLI>                                                     |
| Source        | Active server                                                                         |
| Frequency     | As soon as condition occurs, and at five-minute intervals as long as condition exists |
|               | Trap                                                                                  |
| Trap ID       | 5                                                                                     |
| Trap MIB Name | primaryEMSAssocLostSecEstablished                                                     |

**0004****Explanation**

The **LSMS** has lost association with the primary **EMS** of the network element, which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces <**CLLI**> in the Surveillance notification text; the association with the secondary **EMS** is not established.

**Recovery**

Determine why the primary association failed (connectivity problem, **EMS** software problems, **NE** software problem, etc.). Correct the problem, and then reestablish the association with the primary **EMS**.

**Event Details**

**Table B-11 Event 0004 Details**

| GUI Notification          |                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                              |
| Text                      | Primary Association Failed                                                            |
| Surveillance Notification |                                                                                       |
| Text                      | Notify:Sys Admin - NE CLLI=<CLLI>                                                     |
| Source                    | Active server                                                                         |
| Frequency                 | As soon as condition occurs, and at five-minute intervals as long as condition exists |
| Trap                      |                                                                                       |
| Trap ID                   | 36                                                                                    |
| Trap MIB Name             | primaryEMSAssocLostNoSec                                                              |

**0006****Explanation**

The pending queue used to hold transactions to be sent to the **EMS/NE**, which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces <CLLI> in the Surveillance notification text, is full. To help ensure that no updates are lost, the `eagleagent` will abort associations with both the primary **EMS** and secondary **EMS**. Updates will be queued in a resynchronization log until the **EMS** reassociates.

**Recovery**

Determine why the **EMS/NE** is not receiving **LNP** updates, and correct the problem.

**Event Details****Table B-12 Event 0006 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | Critical                                       |
| Text                      | All Association(s) Aborted: Pending Queue Full |
| Surveillance Notification |                                                |
| Text                      |                                                |
| Source                    | None                                           |
| Frequency                 |                                                |
| Trap                      |                                                |
| Trap ID                   | 97                                             |
| Trap MIB Name             | emsAssociationAbortedQueueFull                 |

**0007****Explanation**

The network element, which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces <CLLI> in the Surveillance notification text, is busy and is sending 'retry later' in response to a message sent by the `eagleagent`. The `eagleagent` has already tried

resending the same message the maximum number of times. The `eagleagent` has aborted associations with both the primary **EMS** and secondary **EMS**.

### Recovery

Correct the problem at the network element. When the **EMS** reconnects with the **LSMS**, the **LSMS** will automatically resynchronize the network element's **LNP** database.

### Event Details

**Table B-13 Event 0007 Details**

| GUI Notification          |                                               |
|---------------------------|-----------------------------------------------|
| Severity                  | Critical                                      |
| Text                      | All Association(s) Aborted: Retries Exhausted |
| Surveillance Notification |                                               |
| Text                      |                                               |
| Source                    | None                                          |
| Frequency                 |                                               |
|                           | Trap                                          |
| Trap ID                   | 98                                            |
| Trap MIB Name             | emsAssocAbortedMaxResend                      |

### 0008

### Explanation

The **LSMS** has lost association with the secondary **EMS** which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces `<CLLI>` in the Surveillance notification text. The association with the primary **EMS** is still up.

### Recovery

Determine why the secondary association failed (connectivity problem, **EMS** software problems, **NE** software problem, etc.) and then reestablish the association with the secondary **EMS**.

### Event Details

**Table B-14 Event 0008 Details**

| GUI Notification          |                                   |
|---------------------------|-----------------------------------|
| Severity                  | Major                             |
| Text                      | Secondary Association Failed      |
| Surveillance Notification |                                   |
| Text                      | Notify:Sys Admin - NE CLLI=<CLLI> |
| Source                    | Active server                     |
| Frequency                 | Once, as soon as condition occurs |
|                           | Trap                              |
| Trap ID                   | 130                               |
| Trap MIB Name             | secondaryEMSAssocLost             |

**0009****Explanation**

The **LSMS** has established the first association with the network element (**NE**) which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces <**CLLI**> in the Surveillance notification text. The first association established is called the primary association. This **EMS** is called the primary **EMS**.

**Recovery**

No action required; this notification is for information only.

**Event Details****Table B-15 Event 0009 Details**

| GUI Notification          |                                 |
|---------------------------|---------------------------------|
| Severity                  | Cleared                         |
| Text                      | Primary Association Established |
| Surveillance Notification |                                 |
| Text                      |                                 |
| Source                    | None                            |
| Frequency                 |                                 |
| Trap                      |                                 |
| Trap ID                   | 8                               |
| Trap MIB Name             | primaryEMSAssocEstablished      |

**0010****Explanation**

The **LSMS** has established the second association with the network element (**NE**) which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces <**CLLI**> in the Surveillance notification text. The association is established only if a primary association already exists. This **EMS** is called the secondary **EMS**.

**Recovery**

No action required; this notification is for information only.

**Event Details****Table B-16 Event 0010 Details**

| GUI Notification          |                                   |
|---------------------------|-----------------------------------|
| Severity                  | Cleared                           |
| Text                      | Secondary Association Established |
| Surveillance Notification |                                   |
| Text                      |                                   |
| Source                    | None                              |
| Frequency                 |                                   |

Table B-16 (Cont.) Event 0010 Details

| Trap          |                              |
|---------------|------------------------------|
| Trap ID       | 134                          |
| Trap MIB Name | secondaryEMSAssocEstablished |

**0011****Explanation**

The primary association for the **EMS/NE**, which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces <**CLLI**> in the Surveillance notification text, is either down or is inhibited, such that transactions sent to the primary **EMS** will not be received by the **NE**. Transactions are being sent to the secondary **EMS** instead of the primary **EMS**.

**Recovery**

Determine why the primary association failed (connectivity problem, **EMS** software problem, **NE** software problem, or other problem). Correct the problem. **Association** will be automatically retried. When the association is reestablished, it will be a secondary association, and the **EMS** will be the secondary **EMS**.

**Event Details**

Table B-17 Event 0011 Details

| GUI Notification          |                                                 |
|---------------------------|-------------------------------------------------|
| Severity                  | Cleared                                         |
| Text                      | Successful Switchover Occurred to Secondary EMS |
| Surveillance Notification |                                                 |
| Text                      |                                                 |
| Source                    | None                                            |
| Frequency                 |                                                 |
| Trap                      |                                                 |
| Trap ID                   | 139                                             |
| Trap MIB Name             | transactionToSecondary                          |

**2000****Explanation**

The **NPAC** Ethernet interface has a problem. The `ping` utility did not receive a response from the interface associated with the **NPAC**.

**Recovery**

Consult with your network administrator.

**Event Details**

**Table B-18 Event 2000 Details**

| GUI Notification          |                                               |
|---------------------------|-----------------------------------------------|
| Severity                  | None                                          |
| Text                      |                                               |
| Surveillance Notification |                                               |
| Text                      | Notify:Sys Admin - NPAC interface failure     |
| Source                    | Both primary and secondary servers            |
| Frequency                 | Every 2.5 minutes as long as condition exists |
|                           | Trap                                          |
| Trap ID                   | 15                                            |
| Trap MIB Name             | npacInterfaceFailure                          |

**2001****Explanation**

The association with the **NPAC** identified by <NPAC\_region\_ID> has been disconnected by the user.

**Recovery**

Examine additional **GUI** notifications to determine whether the **LSMS** is retrying the association. Follow the recovery actions described for the **GUI** notification.

**Event Details****Table B-19 Event 2001 Details**

| GUI Notification          |                                                                     |
|---------------------------|---------------------------------------------------------------------|
| Severity                  | Critical                                                            |
| Text                      | NPAC [<PRIMARY SECONDARY>-<NPAC_region_ID>] Connection Disconnected |
| Surveillance Notification |                                                                     |
| Text                      | Notify:Sys Admin - NPAC=<PRIMARY SECONDARY>-<NPAC_region_ID>        |
| Source                    | Active server                                                       |
| Frequency                 | Once, as soon as condition occurs                                   |
|                           | Trap                                                                |
| Trap ID                   | 37                                                                  |
| Trap MIB Name             | lostNPACAssoc                                                       |

**2002****Explanation**

The **LSMS** is not able to confirm the physical connectivity with the **NPAC**, which is specified in the System field on the **GUI** or is indicated by <NPAC\_region\_ID> in the Surveillance notification.

**Recovery**

Check the physical connection between the **LSMS** and the **NPAC**. The problem may be in the network, a router, or both.

### Event Details

**Table B-20 Event 2002 Details**

| GUI Notification          |                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                              |
| Text                      | <b>LSMS Physical Disconnect with NPAC</b>                                             |
| Surveillance Notification |                                                                                       |
| Text                      | Notify:Sys Admin - <b>NPAC</b> =< <b>NPAC_region_ID</b> >                             |
| Source                    | Active server                                                                         |
| Frequency                 | As soon as condition occurs, and at five-minute intervals as long as condition exists |
| Trap                      |                                                                                       |
| Trap ID                   | 45                                                                                    |
| Trap MIB Name             | failedNPACConnectivity                                                                |

### 2003

#### Explanation

The **NPAC** (**PRIMARY** or **SECONDARY**, as indicated) identified by <**NPAC\_region\_ID**> rejected the association because it received a message from the **LSMS** that failed security checks. This can be due to one of the following:

- The **CMIP** departure time is more than five minutes out of synchronization with the **NPAC** servers.
- The security key is not valid.
- The **CMIP** sequence number is out of sequence (messages must be returned to the **NPAC** in the same order in which they were received).

#### Recovery

Do the following:

1. Log in as `lsmsadm` to the active server.
2. Enter the following command to determine what the **LSMS** system time is:  

```
$ date
```
3. Contact the **NPAC** administrator to determine what the **NPAC** time is. If the **NPAC** time is more than five minutes different from the **LSMS** time, reset the **LSMS** system time on both servers and on the administration console using one of the procedures described in ["Managing the System Clock"](#).
4. After you have verified that the **NPAC** and **LSMS** times are within five minutes of each other, cause a different security key to be used by stopping and restarting the regional agent. Enter the following commands, where <region> is the name of the region in which this notification occurred:  

```
$LSMS_DIR/lsms stop <region> $LSMS_DIR/lsms start <region>
```
5. Start the **GUI** again.



6. Attempt to reassociate with the **NPAC**. For information about associating with an **NPAC**, refer to the *Configuration Guide*.
7. If the problem persists, contact Oracle Technical Service.

### Event Details

**Table B-21 Event 2003 Details**

| GUI Notification          |                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                                       |
| Text                      | NPAC [<PRIMARY SECONDARY>-<NPAC_region_ID>] Connection Aborted by PEER: Access Control Failure |
| Surveillance Notification |                                                                                                |
| Text                      | Notify:Sys Admin - NPAC=<PRIMARY SECONDARY>-<NPAC_region_ID>                                   |
| Source                    | Active server                                                                                  |
| Frequency                 | As soon as condition occurs, and at five-minute intervals as long as condition exists          |
| Trap                      |                                                                                                |
| Trap ID                   | 95                                                                                             |
| Trap MIB Name             | npacRejectedAssocAccessCtrlFail                                                                |

### 2004

#### Explanation

The primary or secondary **NPAC**, identified by <NPAC\_region\_ID>, rejected the association because it received data that was not valid.

#### Recovery

Contact the **NPAC** administrator.

### Event Details

**Table B-22 Event 2004 Details**

| GUI Notification          |                                                                                                              |
|---------------------------|--------------------------------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                                                     |
| Text                      | <b>NPAC</b> [<PRIMARY SECONDARY>-<NPAC_region_ID>] Connection Aborted by <b>PEER</b> : Invalid Data Received |
| Surveillance Notification |                                                                                                              |
| Text                      | Notify:Sys Admin - <b>NPAC</b> =<PRIMARY SECONDARY>-<NPAC_region_ID>                                         |
| Source                    | Active server                                                                                                |
| Frequency                 | As soon as condition occurs, and at five-minute intervals as long as condition exists                        |
| Trap                      |                                                                                                              |
| Trap ID                   | 96                                                                                                           |
| Trap MIB Name             | npacRejectedAssocInvalidData                                                                                 |

### 2005

#### Explanation

The **LSMS** has lost association with the primary or secondary **NPAC** identified by **<NPAC\_region\_ID>** because the user aborted the association.

### Recovery

Reassociate with the **NPAC** when the reason for aborting the association no longer exists. For information about associating with an **NPAC**, refer to the *Configuration Guide*.

### Event Details

**Table B-23 Event 2005 Details**

| GUI Notification          |                                                                                                             |
|---------------------------|-------------------------------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                                                    |
| Text                      | <b>NPAC</b> [ <b>&lt;PRIMARY SECONDARY&gt;</b> ]- <b>&lt;NPAC_region_ID&gt;</b> Association Aborted by User |
| Surveillance Notification |                                                                                                             |
| Text                      | Notify:Sys Admin - <b>NPAC</b> =<br><b>&lt;PRIMARY SECONDARY&gt;</b> - <b>&lt;NPAC_region_ID&gt;</b>        |
| Source                    | Active server                                                                                               |
| Frequency                 | Once, as soon as condition occurs                                                                           |
| Trap                      |                                                                                                             |
| Trap ID                   | 9                                                                                                           |
| Trap MIB Name             | npacAbortByUser                                                                                             |

## 2006

### Explanation

The **LSMS** did not receive an association response from the **NPAC** within the timeout period. The **LSMS** will attempt the association with the **NPAC** again after an interval that defaults to two minutes, but can be configured to a different value by Oracle.

### Recovery

Determine whether there is a network connection problem and/or contact the **NPAC** administrator to determine whether the **NPAC** is up and running.

### Event Details

**Table B-24 Event 2006 Details**

| GUI Notification          |                                                                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                                                                                       |
| Text                      | <b>NPAC</b> [ <b>&lt;PRIMARY SECONDARY&gt;</b> ]- <b>&lt;NPAC_region_ID&gt;</b> ] Bind Timed Out - Auto Retry After <b>NPAC_RETRY_INTERVAL</b> |
| Surveillance Notification |                                                                                                                                                |
| Text                      | Notify:Sys Admin - <b>NPAC</b> =<br><b>&lt;PRIMARY SECONDARY&gt;</b> ]- <b>&lt;NPAC_region_ID&gt;</b>                                          |
| Source                    | Active server                                                                                                                                  |
| Frequency                 | As soon as condition occurs, and at two-minute intervals as long as condition exists                                                           |
| Trap                      |                                                                                                                                                |

Table B-24 (Cont.) Event 2006 Details

|               |                      |
|---------------|----------------------|
| Trap ID       | 100                  |
| Trap MIB Name | assocRespNPACTimeout |

## 2007

## Explanation

The **NPAC** association attempt was rejected by the **NPAC**, and the **LSMS** was informed to attempt the **NPAC** association again to the same **NPAC** host after an interval that defaults to two minutes, but can be configured to a different value by Oracle.

## Recovery

No action required; the **LSMS** will automatically try to associate again.

## Event Details

Table B-25 Event 2007 Details

| GUI Notification          |                                                                                                                                              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                                                                                     |
| Text                      | <b>NPAC</b> [<PRIMARY SECONDARY>-<NPAC_region_ID>] Connection Aborted by <b>PEER</b> - Auto Retry Same Host After <b>NPAC_RETRY_INTERVAL</b> |
| Surveillance Notification |                                                                                                                                              |
| Text                      | Notify:Sys Admin - <b>NPAC</b> =<<br><b>PRIMARY SECONDARY</b> >-<NPAC_region_ID>                                                             |
| Source                    | Active server                                                                                                                                |
| Frequency                 | Once, as soon as condition occurs                                                                                                            |
| Trap                      |                                                                                                                                              |
| Trap ID                   | 101                                                                                                                                          |
| Trap MIB Name             | assocRejectedRetrySameHost                                                                                                                   |

## 2008

## Explanation

The **NPAC** association attempt was rejected by the **NPAC**, and the **LSMS** was informed to attempt the **NPAC** association again to the other **NPAC** host after an interval that defaults to two minutes, but can be configured to a different value by Oracle.

## Recovery

No action required; the **LSMS** will automatically try to associate again.

## Event Details

Table B-26 Event 2008 Details

| GUI Notification |          |
|------------------|----------|
| Severity         | Critical |

Table B-26 (Cont.) Event 2008 Details

|               |                                                                                                                                                                                                        |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Text          | <b>NPAC</b> [< <b>PRIMARY</b>   <b>SECONDARY</b> >]-< <b>NPAC_region_ID</b> >- Connection Aborted by <b>PEER</b> - Auto Retry Other Host After <b>NPAC_RETRY_INTERVAL</b><br>Surveillance Notification |
| Text          | Notify:Sys Admin - <b>NPAC</b> =<br>< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >                                                                                                    |
| Source        | Active server                                                                                                                                                                                          |
| Frequency     | Once, as soon as condition occurs<br>Trap                                                                                                                                                              |
| Trap ID       | 102                                                                                                                                                                                                    |
| Trap MIB Name | assocRejectedRetryOtherHost                                                                                                                                                                            |

**2009****Explanation**

A problem exists in the network connectivity. The **LSMS** will attempt the association with the **NPAC** again after an interval that defaults to two minutes, but can be configured to a different value by Oracle.

**Recovery**

Check the network connectivity for errors. Verify the ability to ping the **NPAC** from the **LSMS**.

**Event Details**

Table B-27 Event 2009 Details

|                  |                                                                                                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GUI Notification |                                                                                                                                                                                                          |
| Severity         | Critical                                                                                                                                                                                                 |
| Text             | <b>NPAC</b> [< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >] Connection Aborted by <b>PROVIDER</b> - Auto Retry Same Host After <b>NPAC_RETRY_INTERVAL</b><br>Surveillance Notification |
| Text             | Notify:Sys Admin - <b>NPAC</b> =<br>< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >                                                                                                      |
| Source           | Active server                                                                                                                                                                                            |
| Frequency        | Once, as soon as condition occurs<br>Trap                                                                                                                                                                |
| Trap ID          | 103                                                                                                                                                                                                      |
| Trap MIB Name    | nwtkProblemRetryNPACAssoc                                                                                                                                                                                |

**2010****Explanation**

The **LSMS** received three consecutive responses from the **NPAC** with a download status of failure from a recovery action request. The **LSMS** has aborted the association and will attempt to associate again after a retry interval that defaults to five minutes, but can be configured to a different value by Oracle. The **LSMS** will retry the recovery action after the association is reestablished.

**Recovery**

No action required; the **LSMS** will automatically try to associate again.

**Event Details****Table B-28 Event 2010 Details**

| GUI Notification          |                                                                                                                                                                        |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                                                                                                               |
| Text                      | <b>NPAC</b> [< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >] Connection Aborted Due to Recovery Failure - Auto Retry After <b>NPAC_RETRY_INTERVAL</b> |
| Surveillance Notification |                                                                                                                                                                        |
| Text                      | Notify:Sys Admin - <b>NPAC</b> =<br>< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >                                                                    |
| Source                    | Active server                                                                                                                                                          |
| Frequency                 | Once, as soon as condition occurs                                                                                                                                      |
| Trap                      |                                                                                                                                                                        |
| Trap <b>ID</b>            | 104                                                                                                                                                                    |
| Trap <b>MIB</b> Name      | IsmsAbortedNPACassocDowRecFail                                                                                                                                         |

**2011****Explanation**

The **LSMS** has disconnected the association with the **NPAC** region in question due to the lack of a response to heartbeat messages from the **LSMS** to the **NPAC**.

**Recovery**

Contact My Oracle Support.

**Event Details****Table B-29 Event 2011 Details**

| GUI Notification          |                                                                                                                    |
|---------------------------|--------------------------------------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                                                           |
| Text                      | <b>NPAC</b> [< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >] Connection Disconnected by Heartbeat |
| Surveillance Notification |                                                                                                                    |
| Text                      | Notify:Sys Admin - <b>NPAC</b> =<br>< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >                |
| Source                    | Active server                                                                                                      |
| Frequency                 | Once, as soon as condition occurs                                                                                  |
| Trap                      |                                                                                                                    |
| Trap <b>ID</b>            | 111                                                                                                                |
| Trap <b>MIB</b> Name      | lostNPACAssoc                                                                                                      |

**2012****Explanation**

The **NPAC** (*primary* or *secondary*, as indicated) identified by **<NPAC\_region\_ID>** rejected the association because of an access control failure. This can be due to one of the following:

- The **OSI** Presentation Address is incorrect.
- The Service Provider **ID** in the regional configuration file is incorrect.
- The **CMIP** departure time is more than five minutes out of synchronization with the **NPAC** servers.
- The security key is not valid.

**Recovery**

Do the following:

1. Verify that the correct **PSEL**, **SSEL**, **TSEL**, and **NSAP** values have been configured for the **OSI** Presentation Address (for more information, refer to “Viewing a Configured **NPAC** Component” in the *Configuration Guide*). If you need to change the values, use the procedure described in “Modifying an **NPAC** Component” in the *Configuration Guide*.
2. Verify that the configured Service Provider **ID** (**SPID**) is the same as the **SPID** assigned by the **NPAC**. For more information about this configuration file, refer to “Modifying **LSMS** Configuration Components” in the *Configuration Guide*.
3. Verify that the configured **NPAC\_SMS\_NAME** is the same as the value assigned by the **NPAC** (this field is case-sensitive). For more information about this configuration file, refer to “Modifying an **NPAC** Component” in the *Configuration Guide*.
4. Log in as `lsmsadm` to the active server.
5. Enter the following command to determine what the **LSMS** system time is:  

```
$ date
```
6. Contact the **NPAC** administrator to determine what the **NPAC** time is. If the **NPAC** time is more than five minutes different from the **LSMS** time, reset the **LSMS** system time on both servers and on the administration console by performing one of the procedures described in “[Managing the System Clock](#)”.
7. After you have verified that the **NPAC** and **LSMS** times are within five minutes of each other, cause a different security key to be used by stopping and restarting the regional agent. Enter the following commands, where **<region>** is the name of the region in which this notification occurred:  

```
$ $LSMS_DIR/lsms stop <region> $ $LSMS_DIR/lsms start <region>
```
8. Start the **GUI** again.
9. Attempt to reassociate with the **NPAC**.
10. If the problem persists, contact Oracle Technical Service.

**Event Details****Table B-30 Event 2012 Details**

| GUI Notification |          |
|------------------|----------|
| Severity         | Critical |

**Table B-30 (Cont.) Event 2012 Details**

|               |                                                                                                                                    |
|---------------|------------------------------------------------------------------------------------------------------------------------------------|
| Text          | <b>NPAC</b> [< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >] Connection Attempt Failed:<br>Access Control Failure |
|               | Surveillance Notification                                                                                                          |
| Text          | Notify:Sys Admin - <b>NPAC</b> =<br>< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >                                |
| Source        | Active server                                                                                                                      |
| Frequency     | Once, as soon as condition occurs                                                                                                  |
|               | Trap                                                                                                                               |
| Trap ID       | 106                                                                                                                                |
| Trap MIB Name | assocRejDueToAccessControl                                                                                                         |

**2014****Explanation**

The userInfo value in the cmipUserInfo portion of the **NPAC** association response **CMIP** message is not valid.

**Recovery**

Contact the **NPAC** administrator to determine why the **NPAC** is sending an invalid association response.

**Event Details****Table B-31 Event 2014 Details**

|               |                                                                                                                                   |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------|
|               | <b>GUI Notification</b>                                                                                                           |
| Severity      | Critical                                                                                                                          |
| Text          | <b>NPAC</b> [< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >] Connection Attempt Failed:<br>Invalid Data Received |
|               | Surveillance Notification                                                                                                         |
| Text          | Notify:Sys Admin - <b>NPAC</b> =<br>< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >                               |
| Source        | Active server                                                                                                                     |
| Frequency     | Once, as soon as condition occurs                                                                                                 |
|               | Trap                                                                                                                              |
| Trap ID       | 108                                                                                                                               |
| Trap MIB Name | npacConnFailedCMIP                                                                                                                |

**2015****Explanation**

The **NPAC** association was terminated gracefully by the **NPAC**.

**Recovery**

According to the **NANC** specifications, this should never occur; if this message is seen, contact the **NPAC** administrator for the reason for the association unbind.

### Event Details

**Table B-32 Event 2015 Details**

| GUI Notification          |                                                                                                                      |
|---------------------------|----------------------------------------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                                                             |
| Text                      | <b>NPAC</b> [< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >] Connection Disconnected by <b>NPAC</b> |
| Surveillance Notification |                                                                                                                      |
| Text                      | Notify:Sys Admin - <b>NPAC</b> =<br>< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >                  |
| Source                    | Active server                                                                                                        |
| Frequency                 | As soon as condition occurs, and at five-minute intervals as long as condition exists                                |
| Trap                      |                                                                                                                      |
| Trap ID                   | 109                                                                                                                  |
| Trap MIB Name             | npacAssocGracefullyTerminated                                                                                        |

### 2018

### Explanation

The **LSMS** was unable to properly resynchronize (with the **NPAC**) the data that was lost while the **LSMS** was not associated with the **NPAC**.

### Recovery

Do the following:

1. Abort the **NPAC** association (refer to the *Configuration Guide*).
2. Attempt to reassociate with the **NPAC** (refer to the *Configuration Guide*).
3. If the reassociation is not successful, contact the **NPAC** and contact My Oracle Support.

### Event Details

**Table B-33 Event 2018 Details**

| GUI Notification          |                                                                                               |
|---------------------------|-----------------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                                      |
| Text                      | <b>NPAC</b> [< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >] Recovery Failed |
| Surveillance Notification |                                                                                               |
| Text                      |                                                                                               |
| Source                    | None                                                                                          |
| Frequency                 |                                                                                               |
| Trap                      |                                                                                               |
| Trap ID                   | 112                                                                                           |
| Trap MIB Name             | lsmsDataLostBadResynch                                                                        |



**2019****Explanation**

The **LSMS** data lost during the resynchronization time was not resynchronized properly with the **NPAC**.

**Recovery**

Do the following:

1. Abort the **NPAC** association (refer to the *Configuration Guide*).
2. Reestablish the **NPAC** association (refer to the *Configuration Guide*).
3. Determine whether notification 8055 NPAC <PRIMARY|SECONDARY> Recovery Complete is posted. If instead notification 2019 reappears, perform a resynchronization for a period of time starting one hour before the 2019 notification first appeared, using either the **GUI** (refer to “Resynchronizing for a Defined Period of Time Using the **GUI**” in the *Database Administrator's Guide*).
4. If 2019 continues to appear, contact My Oracle Support.

**Event Details****Table B-34 Event 2019 Details**

| GUI Notification          |                                                                             |
|---------------------------|-----------------------------------------------------------------------------|
| Severity                  | Critical                                                                    |
| Text                      | <b>NPAC</b> [<PRIMARY SECONDARY>-<NPAC_region_ID>] Recovery Partial Failure |
| Surveillance Notification |                                                                             |
| Text                      | <b>NPAC</b> [<PRIMARY SECONDARY>-<NPAC_region_ID>] Recovery Failure         |
| Source                    | Active server                                                               |
| Frequency                 | Once , as soon as condition occurs                                          |
| Trap                      |                                                                             |
| Trap ID                   | 113                                                                         |
| Trap MIB Name             | badNPACresynchTime                                                          |

**2020****Explanation**

The **LSMS** aborted the **NPAC** association because the **LSMS** received a message from the **NPAC** that did not have the correct **LSMS** key signature.

**Recovery**

Verify that the correct keys are being used by both the **NPAC** and the **LSMS**.

**Event Details****Table B-35 Event 2020 Details**

| GUI Notification |          |
|------------------|----------|
| Severity         | Critical |

Table B-35 (Cont.) Event 2020 Details

|               |                                                                                                                                                                        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Text          | <b>NPAC</b> [< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >] Security Violation.<br><b>Association</b> Aborted. Retrying<br>Surveillance Notification |
| Text          | Notify:Sys Admin - <b>NPAC</b> =<br>< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >                                                                    |
| Source        | Active server                                                                                                                                                          |
| Frequency     | Once, as soon as condition occurs<br>Trap                                                                                                                              |
| Trap ID       | 114                                                                                                                                                                    |
| Trap MIB Name | assocAbortedBadKeys                                                                                                                                                    |

**2021****Explanation**

An associate retry timer was in effect. The retry attempt was canceled because a **GUI** user issued an Associate, Abort or Disconnect request. If an Associate request was issued, the association is attempted immediately.

**Recovery**

No action required; for information only.

**Event Details**

Table B-36 Event 2021 Details

|                         |                                                                                                                                                           |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GUI Notification</b> |                                                                                                                                                           |
| Severity                | Major                                                                                                                                                     |
| Text                    | <b>NPAC</b> [< <b>PRIMARY</b>   <b>SECONDARY</b> >-< <b>NPAC_region_ID</b> >] Automatic <b>Association</b><br>Retry Canceled<br>Surveillance Notification |
| Text                    |                                                                                                                                                           |
| Source                  | None                                                                                                                                                      |
| Frequency               | Trap                                                                                                                                                      |
| Trap ID                 | 122                                                                                                                                                       |
| Trap MIB Name           | npacAutoAssociationRetryCanceled                                                                                                                          |

**2022****Explanation**

Either the **LSMS** did not receive any response from the **NPAC** before a timeout expired or the **LSMS** received a response from the **NPAC** with a download status of failure from a recovery action request. The **NPAC** is unable to process the recovery action due to a temporary resource limitation. The **LSMS** will retry the request for the number of times indicated by <retry\_number> with the interval between each retry indicated by <retry\_interval>

minutes. If recovery is not successful after the indicated number of retries, the **LSMS** will abort the association and post the following notification:

```
[Critical]: <Timestamp> 2010
: NPAC [<PRIMARY|SECONDARY>-<NPAC_region_ID>] Connection Aborted Due to
Recovery Failure - Auto Retry After NPAC_RETRY_INTERVAL
```

### Recovery

No action required; for information only.

### Event Details

**Table B-37 Event 2022 Details**

| GUI Notification          |                                                                                                                                                                |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Severity                  | Major                                                                                                                                                          |
| Text                      | <b>NPAC</b> [<PRIMARY SECONDARY>-<NPAC_region_ID>] Fail/No Response from<br><b>NPAC</b> Recovery - Auto Retry <retry_number> Times in <retry_interval> Minutes |
| Surveillance Notification |                                                                                                                                                                |
| Text                      |                                                                                                                                                                |
| Source                    | None                                                                                                                                                           |
| Frequency                 |                                                                                                                                                                |
| Trap                      |                                                                                                                                                                |
| Trap ID                   | 123                                                                                                                                                            |
| Trap MIB Name             | npacRecoveryFailureResourceLimit                                                                                                                               |

## 2023

### Explanation

The **NPAC** association will be down for the specified period of time (from the first time field shown in the notification to the second time field shown in the notification) due to **NPAC**-scheduled down time.

### Recovery

When the scheduled down time is over, manually reestablish the **NPAC** association. For information about aborting and reestablishing an association, refer to the *Configuration Guide*.

### Event Details

**Table B-38 Event 2023 Details**

| GUI Notification          |                                                                                                                      |
|---------------------------|----------------------------------------------------------------------------------------------------------------------|
| Severity                  | Major                                                                                                                |
| Text                      | <b>NPAC</b> [<PRIMARY SECONDARY>-<NPAC_region_ID>] ScheduleDownTime from<br>[<YYYYMMDDhhmmss>] to [<YYYYMMDDhhmmss>] |
| Surveillance Notification |                                                                                                                      |
| Text                      |                                                                                                                      |
| Source                    | None                                                                                                                 |

**Table B-38 (Cont.) Event 2023 Details**

|               |                     |  |
|---------------|---------------------|--|
| Frequency     | Trap                |  |
| Trap ID       | 124                 |  |
| Trap MIB Name | npacAssocPeriodDown |  |

## 2024

### Explanation

An Associate request has been sent to the **NPAC** after a retry timer expired.

### Recovery

No action required; for information only.

### Event Details

**Table B-39 Event 2024 Details**

|                  |                                                                                                  |  |
|------------------|--------------------------------------------------------------------------------------------------|--|
| GUI Notification |                                                                                                  |  |
| Severity         | Major                                                                                            |  |
| Text             | <b>NPAC</b> [<PRIMARY SECONDARY>-<NPAC_region_ID>] Timer Expired - Resending Association Request |  |
|                  | Surveillance Notification                                                                        |  |
| Text             |                                                                                                  |  |
| Source           | None                                                                                             |  |
| Frequency        | Trap                                                                                             |  |
| Trap ID          | 125                                                                                              |  |
| Trap MIB Name    | npacAssocRequestSentAfterRetryTimer                                                              |  |

## 2025

### Explanation

The **NPAC** association was successfully established.

### Recovery

No action required; for information only.

### Event Details

**Table B-40 Event 2025 Details**

|                  |                                                                                        |  |
|------------------|----------------------------------------------------------------------------------------|--|
| GUI Notification |                                                                                        |  |
| Severity         | Cleared                                                                                |  |
| Text             | <b>NPAC</b> [<PRIMARY SECONDARY>-<NPAC_region_ID>] Connection Successfully Established |  |
|                  | Surveillance Notification                                                              |  |

**Table B-40 (Cont.) Event 2025 Details**

|               |                      |
|---------------|----------------------|
| Text          |                      |
| Source        | None                 |
| Frequency     |                      |
|               | Trap                 |
| Trap ID       | 7                    |
| Trap MIB Name | npacAssocEstablished |

**4000****Explanation**

The active server has initiated an automatic switchover to the inactive server.

**Recovery**

No action required; for information only.

**Event Details****Table B-41 Event 4000 Details**

|               |                                         |
|---------------|-----------------------------------------|
|               | <b>GUI Notification</b>                 |
| Severity      | Event                                   |
| Text          | Switchover Initiated                    |
|               | <b>Surveillance Notification</b>        |
| Text          | Notify:Sys Admin - Switchover initiated |
| Source        | Active server                           |
| Frequency     | Once, soon as condition occurs.         |
|               | Trap                                    |
| Trap ID       | 11                                      |
| Trap MIB Name | switchOverStarted                       |

**4001****Explanation**

LSMS service has been switched over.

**Recovery**

No action required; for information only.

**Event Details****Table B-42 Event 4001 Details**

|          |                         |
|----------|-------------------------|
|          | <b>GUI Notification</b> |
| Severity | Event                   |
| Text     | Switchover complete     |

**Table B-42 (Cont.) Event 4001 Details**

| Surveillance Notification |                                        |
|---------------------------|----------------------------------------|
| Text                      | Notify:Sys Admin - Switchover complete |
| Source                    | Active server                          |
| Frequency                 | Once, soon as condition occurs.        |
| Trap                      |                                        |
| Trap ID                   | 12                                     |
| Trap MIB Name             | switchOverCompleted                    |

**4002****Explanation**

**LSMS** service could not be switched over to the inactive server; the inactive server was not able to start **LSMS** service.

**Recovery**

Contact My Oracle Support.

**Event Details****Table B-43 Event 4002 Details**

| GUI Notification          |                                      |
|---------------------------|--------------------------------------|
| Severity                  | Event                                |
| Text                      | Switchover Failed                    |
| Surveillance Notification |                                      |
| Text                      | Notify:Sys Admin - Switchover Failed |
| Source                    | Active server                        |
| Frequency                 | Once, as soon as condition occurs.   |
| Trap                      |                                      |
| Trap ID                   | 13                                   |
| Trap MIB Name             | switchOverFailed                     |

**4003****Explanation**

This notification indicates that the disk controller <controllerId> is out of service and is affecting shared storage. This notification is only valid on E3000 systems.

controllerId= The specific controller number (either 0 or 1).

**Recovery**

Contact My Oracle Support for assistance.

**Event Details**

**Table B-44 Event 4003 Details**

| GUI Notification          |                                                    |
|---------------------------|----------------------------------------------------|
| Severity                  | None                                               |
| Text                      |                                                    |
| Surveillance Notification |                                                    |
| Text                      | Notify:Sys Admin - Loss of disk on < controllerId> |
| Source                    | Either server                                      |
| Frequency                 | Every 5 minutes as long as condition exists        |
|                           | Trap                                               |
| Trap ID                   | 14                                                 |
| Trap MIB Name             | diskContrService                                   |

**4004****Explanation**

The Ethernet interface used to connect to the application network has a problem. This interface usually connects to network-connected workstations. The `ping` utility did not receive a response from the interface associated with the application network.

**Recovery**

Consult with your network administrator.

**Event Details****Table B-45 Event 4004 Details**

| GUI Notification          |                                                 |
|---------------------------|-------------------------------------------------|
| Severity                  | None                                            |
| Text                      |                                                 |
| Surveillance Notification |                                                 |
| Text                      | Notify:Sys Admin - <b>APP</b> interface failure |
| Source                    | Either server                                   |
| Frequency                 | Every 2.5 minutes as long as condition exists   |
|                           | Trap                                            |
| Trap ID                   | 17                                              |
| Trap MIB Name             | appsInterfaceFailure                            |

**4005****Explanation**

This notification indicates that the Ethernet interface used to connect to the ADMINISTRATION network has a problem.

**Recovery**

Consult with your network administrator.

**Event Details****Table B-46 Event 4005 Details**

| GUI Notification          |                                               |
|---------------------------|-----------------------------------------------|
| Severity                  | None                                          |
| Text                      |                                               |
| Surveillance Notification |                                               |
| Text                      | Notify:Sys Admin - ADMIN interface faire      |
| Source                    | Either server                                 |
| Frequency                 | Every 2.5 minutes as long as condition exists |
|                           | Trap                                          |
| Trap ID                   | 18                                            |
| Trap MIB Name             | adminInterfaceFailure                         |

**4006****Explanation**

This notification indicates that the system disk has lost synchronization, possibly due to a hardware problem.

driveSpecId= disk drive specification.

**Recovery**

Contact My Oracle Support for assistance.

**Event Details****Table B-47 Event 4006 Details**

| GUI Notification          |                                             |
|---------------------------|---------------------------------------------|
| Severity                  | None                                        |
| Text                      |                                             |
| Surveillance Notification |                                             |
| Text                      | Notify:Sys Admin - < driveSpecId >          |
| Source                    | Either server                               |
| Frequency                 | Every 5 minutes as long as condition exists |
|                           | Trap                                        |
| Trap ID                   | 20                                          |
| Trap MIB Name             | systemDiskSynch                             |

**4007****Explanation**

**Database** replication has failed.

**Recovery**

Contact My Oracle Support.



## Event Details

**Table B-48 Event 4007 Details**

| GUI Notification          |                                           |
|---------------------------|-------------------------------------------|
| Severity                  | Critical                                  |
| Text                      | <b>DB</b> Repl Err - <dbReplErr>          |
| Surveillance Notification |                                           |
| Text                      | Notify:Sys Admin - <b>DB</b> repl error   |
| Source                    | Both servers                              |
| Frequency                 | Every minute as long as condition exists. |
| Trap                      |                                           |
| Trap ID                   | 21                                        |
| Trap MIB Name             | dataReplError                             |

### 4008

#### Explanation

The database replication process monitor has failed.

#### Recovery

Contact My Oracle Support.

#### Event Details

**Table B-49 Event 4008 Details**

| GUI Notification          |                                                 |
|---------------------------|-------------------------------------------------|
| Severity                  | Critical                                        |
| Text                      | <b>DB</b> Proc Mon Err - <dbMonErr>             |
| Surveillance Notification |                                                 |
| Text                      | Notify:Sys Admin - <b>DB</b> monitor failure    |
| Source                    | Active server                                   |
| Frequency                 | Every five minutes as long as condition exists. |
| Trap                      |                                                 |
| Trap ID                   | 22                                              |
| Trap MIB Name             | dbMonitorFail                                   |

### 4009

#### Explanation

The server has an internal disk error.

#### Recovery

Contact My Oracle Support.

#### Event Details

**Table B-50 Event 4009 Details**

| GUI Notification          |                                                                                                         |
|---------------------------|---------------------------------------------------------------------------------------------------------|
| Severity                  | None                                                                                                    |
| Text                      |                                                                                                         |
| Surveillance Notification |                                                                                                         |
| Text                      | Notify:Sys Admin - Internal Disk Error                                                                  |
| Source                    | Either server                                                                                           |
| Frequency                 | Within five minutes of the condition occurring and at five-minute intervals as long as condition exists |
|                           | Trap                                                                                                    |
| Trap ID                   | 23                                                                                                      |
| Trap MIB Name             | internalDiskError                                                                                       |

**4010****Explanation**

This notification indicates that the hot-spare feature has completed automatic data resynchronization.

**Recovery**

No action required; this notification is for information only.

**Event Details****Table B-51 Event 4010 Details**

| GUI Notification          |                                                     |
|---------------------------|-----------------------------------------------------|
| Severity                  | None                                                |
| Text                      |                                                     |
| Surveillance Notification |                                                     |
| Text                      | Notify:Sys Admin - < driveSpecId >- < driveSpecId > |
| Source                    | Either server                                       |
| Frequency                 | Once                                                |
|                           | Trap                                                |
| Trap ID                   | 24                                                  |
| Trap MIB Name             | hotSparedDataResynch                                |

**4011****Explanation**

This notification indicates that LSMS database replication is delayed.

**Recovery**

No action required.

## Event Details

Table B-52 Event 4011 Details

| GUI Notification          |                                                                                                         |
|---------------------------|---------------------------------------------------------------------------------------------------------|
| Severity                  | N/A                                                                                                     |
| Text                      | DB Repl Info                                                                                            |
| Surveillance Notification |                                                                                                         |
| Text                      | Notify:Sys Admin - DB repl info                                                                         |
| Source                    | Either server                                                                                           |
| Frequency                 | Within five minutes of the condition occurring and every minute thereafter as long as condition exists. |
| Trap                      |                                                                                                         |
| Trap ID                   | 25                                                                                                      |
| Trap MIB Name             | dataReplInfo                                                                                            |

## 4012

## Explanation

A process specified by `<process_name>` is utilizing 40 percent or more of the LSMS's CPU resource and the `<second_ID>` indicates a specific instance of the process, as follows:

- When the `<process_name>` is `eagleagent`, the `<second_ID>` specifies the Common Language Location Indicator (CLLI) of the network element
- When the `<process_name>` is `npacagent`, the `<second_ID>` specifies the name of the region
- When the `<process_name>` is not `eagleagent` or `npacagent`, the `<second_ID>` specifies the process ID (PID) of the process.

## Recovery

Because this notification is posted every five minutes as long as the condition exists, you may choose to ignore this notification the first time that it appears. However, if this notification is repeated several times in a row, do one of the following:

1. If the `<process_name>` is not `npacagent`, go to step 4. Otherwise, determine whether the `npacagent` is still using 40% or more of the CPU resource by entering the following command, where `<region>` can be optionally specified (it is the name of the region as displayed at the end of the notification text):

```
$ ps -eo pid,pcpu,args | grep npacagent | grep <region>
```

2. If the `npacagent` is still using 40% or more of the CPU resource, enter the following commands to stop the `npacagent` and restart it, where `<region>` is the name of the NPAC region whose `npacagent` is using 40% or more of the CPU resource:

```
$ cd $LSMS_DIR
$ lsms stop <region>

$ lsms start <region>
```

3. Repeat step 1. If the `npacagent` you tried to stop is still using 40% or more of the CPU resource, contact My Oracle Support.

4. If the `<process_name>` is not `eagleagent`, go to step 7. Otherwise, determine whether the `eagleagent` is still using 40% or more of the **CPU** resource by entering the following command, where `<CLLI>` can be optionally specified (it is the name of the network element as displayed at the end of the notification text):

```
$ ps -eo pid,pcpu,args | grep eagleagent | grep <CLLI>
```

5. If the `eagleagent` is still using 40% or more of the **CPU** resource, enter the following commands to stop the `eagleagent` and restart it, where `<CLLI>` is the Common Language Location Indicator (**CLLI**) of the network element whose `eagleagent` is using 40% or more of the **CPU** resource:

```
$ cd $LSMS_DIR
$ eagle stop <CLLI>

$ eagle start <region>
```

6. Repeat step 1. If the process you tried to stop is still using 40% or more of the **CPU** resource, contact My Oracle Support.
7. If the `<process_name>` is not `eagleagent` or `npacagent`, contact My Oracle Support.

### Event Details

**Table B-53 Event 4012 Details**

| GUI Notification          |                                                                                                                        |
|---------------------------|------------------------------------------------------------------------------------------------------------------------|
| Severity                  | Major                                                                                                                  |
| Text                      | Process [ <code>&lt;process_name&gt;</code> - <code>&lt;second_ID&gt;</code> ] Utilizing High Percentage of <b>CPU</b> |
| Surveillance Notification |                                                                                                                        |
| Text                      | Notify:Sys Admin - [ <code>&lt;process_name&gt;</code> - <code>&lt;second_ID&gt;</code> ]                              |
| Source                    | Either server                                                                                                          |
| Frequency                 | Every five minutes as long as condition exists                                                                         |
| Trap                      |                                                                                                                        |
| Trap ID                   | 26                                                                                                                     |
| Trap MIB Name             | cpuUtilizationOver39                                                                                                   |

### 4013

#### Explanation

The **LSMS** server with default hostname `lsmspri` has been inhibited.

#### Recovery

As soon as possible, start the server by performing the procedure described in [“Starting a Server”](#).

### Event Details

**Table B-54 Event 4013 Details**

| GUI Notification |       |
|------------------|-------|
| Severity         | Major |

**Table B-54 (Cont.) Event 4013 Details**

|               |                                                                                       |
|---------------|---------------------------------------------------------------------------------------|
| Text          | Primary Server Inhibited                                                              |
|               | Surveillance Notification                                                             |
| Text          | Notify:Sys Admin - Primary inhibited                                                  |
| Source        | Server with default hostname <code>lsmspri</code>                                     |
| Frequency     | As soon as condition occurs, and at five-minute intervals as long as condition exists |
|               | Trap                                                                                  |
| Trap ID       | 27                                                                                    |
| Trap MIB Name | <code>primaryServerInhibited</code>                                                   |

**4014****Explanation**

The **LSMS** server with default hostname `lsmsssec` has been inhibited.

**Recovery**

As soon as possible, start the server by performing the procedure described in [“Starting a Server”](#).

**Event Details****Table B-55 Event 4014 Details**

|               |                                                                                       |
|---------------|---------------------------------------------------------------------------------------|
|               | GUI Notification                                                                      |
| Severity      | Major                                                                                 |
| Text          | Secondary Server Inhibited                                                            |
|               | Surveillance Notification                                                             |
| Text          | Notify:Sys Admin - Secondary inhibited                                                |
| Source        | Server with default hostname <code>lsmsssec</code>                                    |
| Frequency     | As soon as condition occurs, and at five-minute intervals as long as condition exists |
|               | Trap                                                                                  |
| Trap ID       | 28                                                                                    |
| Trap MIB Name | <code>secondaryServerInhibited</code>                                                 |

**4015****Explanation**

A heartbeat link is down.

**Recovery**

Contact My Oracle Support.

**Event Details**

**Table B-56 Event 4015 Details**

| GUI Notification          |                                      |
|---------------------------|--------------------------------------|
| Severity                  | None                                 |
| Text                      |                                      |
| Surveillance Notification |                                      |
| Text                      | Notify:Sys Admin - Heartbeat failure |
| Source                    | Both servers                         |
| Frequency                 | Once, as soon as condition occurs    |
| Trap                      |                                      |
| Trap ID                   | 29                                   |
| Trap MIB Name             | heartbeatLinkDown                    |

**4016****Explanation**

This notification indicates that the Heartbeat 2 link is down.

**Recovery**

Contact My Oracle Support for assistance.

**Event Details****Table B-57 Event 4016 Details**

| GUI Notification          |                                        |
|---------------------------|----------------------------------------|
| Severity                  | None                                   |
| Text                      |                                        |
| Surveillance Notification |                                        |
| Text                      | Notify:Sys Admin - Heartbeat 2 failure |
| Source                    | Both server                            |
| Frequency                 | Once                                   |
| Trap                      |                                        |
| Trap ID                   | 30                                     |
| Trap MIB Name             | heartbeatLinkTwoDown                   |

**4017****Explanation**

This notification indicates that the LSMS network configuration is incorrect.

**Recovery**

Customer or field engineers should:

- Verify network configuration and network cabling
- Verify serial configuration and cabling if serial keepalive is configured

- If the problem persists, contact My Oracle Support

**Event Details****Table B-58 Event 4017 Details**

| GUI Notification          |                                        |
|---------------------------|----------------------------------------|
| Severity                  | None                                   |
| Text                      |                                        |
| Surveillance Notification |                                        |
| Text                      | Notify:Sys Admin - Network setup error |
| Source                    | Active server                          |
| Frequency                 | Every 5 minutes                        |
|                           | Trap                                   |
| Trap ID                   | 31                                     |
| Trap MIB Name             | IsmsNtwkConfigError                    |

**4018****Explanation**

This notification indicates that the LSMS network configuration is not supported or recommended.

**Recovery**

Contact My Oracle Support for assistance.

**Event Details****Table B-59 Event 4018 Details**

| GUI Notification          |                                          |
|---------------------------|------------------------------------------|
| Severity                  | None                                     |
| Text                      |                                          |
| Surveillance Notification |                                          |
| Text                      | Notify:Sys Admin - Network setup un supp |
| Source                    | Active server                            |
| Frequency                 | Every 5 minutes                          |
|                           | Trap                                     |
| Trap ID                   | 32                                       |
| Trap MIB Name             | IsmsNtwkConfigNotSupported               |

**4019****Explanation**

This notification indicates that the disk volume specified by diskVolName has exceeded the 95 percent usage threshold.

**Recovery**

Contact My Oracle Support for assistance.

### Event Details

**Table B-60 Event 4019 Details**

| GUI Notification          |                                    |
|---------------------------|------------------------------------|
| Severity                  | None                               |
| Text                      |                                    |
| Surveillance Notification |                                    |
| Text                      | Notify:Sys Admin - < diskVolName > |
| Source                    | Either server                      |
| Frequency                 | Every 5 minutes                    |
|                           | Trap                               |
| Trap ID                   | 38                                 |
| Trap MIB Name             | diskVolume95Usage                  |

### 4020

#### Explanation

The server's swap space has exceeded the critical usage threshold (default = 95%).

#### Recovery

If the problem persists, contact My Oracle Support.

### Event Details

**Table B-61 Event 4020 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | Critical                                       |
| Text                      | Swap space exceeds Critical                    |
| Surveillance Notification |                                                |
| Text                      | Notify:Sys Admin - Swap space Critical         |
| Source                    | Either server                                  |
| Frequency                 | Every five minutes as long as condition exists |
|                           | Trap                                           |
| Trap ID                   | 39                                             |
| Trap MIB Name             | swapSpaceCritical                              |

### 4021

#### Explanation

The **LSMS** application or system **daemon** whose name has <process\_name> as the first 12 characters is not running.

#### Recovery



No user action is necessary. The Surveillance process automatically restarts the Service Assurance process (`sacw`) and the `sentryd` process automatically restarts other processes.

### Event Details

**Table B-62 Event 4021 Details**

| GUI Notification          |                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------|
| Severity                  | None                                                                                  |
| Text                      |                                                                                       |
| Surveillance Notification |                                                                                       |
| Text                      | Notify:Sys Admin - <process_name> failed                                              |
| Source                    | Active server                                                                         |
| Frequency                 | As soon as condition occurs, and at five-minute intervals as long as condition exists |
|                           | Trap                                                                                  |
| Trap ID                   | 40                                                                                    |
| Trap MIB Name             | IsmsAppsNotRunning                                                                    |

### 4022

#### Explanation

The backup of the **LSMS** database has completed successfully.

#### Recovery

No action required; for information only.

### Event Details

**Table B-63 Event 4022 Details**

| GUI Notification          |                                   |
|---------------------------|-----------------------------------|
| Severity                  | None                              |
| Text                      |                                   |
| Surveillance Notification |                                   |
| Text                      | <b>DATABASE</b> backup complete   |
| Source                    | Standby server                    |
| Frequency                 | Once, as soon as condition occurs |
|                           | Trap                              |
| Trap ID                   | 41                                |
| Trap MIB Name             | backupCompleted                   |

### 4023

#### Explanation

The backup of the **LSMS** database has failed.

#### Recovery

Review backup output to determine why backup failed, correct the problems, and run backup script again manually.

**Note:**

Determine whether the NAS can be reached using the ping command. If the NAS cannot be reached, restart the NAS. To restart the NAS turn the power off, then turn the power on. If the NAS can be reached, contact My Oracle Support for assistance.

**Event Details****Table B-64 Event 4023 Details**

| GUI Notification          |                                                  |
|---------------------------|--------------------------------------------------|
| Severity                  | None                                             |
| Text                      |                                                  |
| Surveillance Notification |                                                  |
| Text                      | Notify:Sys Admin - <b>DATABASE</b> backup failed |
| Source                    | Standby server                                   |
| Frequency                 | Once, as soon as condition occurs                |
| Trap                      |                                                  |
| Trap ID                   | 42                                               |
| Trap MIB Name             | backupFailed                                     |

**4024****Explanation**

The primary **LSMS** server (Server 1A) is not providing the **LSMS** service.

**Recovery**

No action required; for information only.

**Event Details****Table B-65 Event 4024 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | None                                           |
| Text                      |                                                |
| Surveillance Notification |                                                |
| Text                      | Notify:Sys Admin - Primary not online          |
| Source                    | Both primary and secondary servers             |
| Frequency                 | Every five minutes as long as condition exists |
| Trap                      |                                                |
| Trap ID                   | 63                                             |
| Trap MIB Name             | primaryServerNotOnline                         |

**4025****Explanation**

The standby server is not prepared to take over **LSMS** service.

**Recovery**

Contact My Oracle Support.

**Event Details****Table B-66 Event 4025 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | None                                           |
| Text                      |                                                |
| Surveillance Notification |                                                |
| Text                      | Notify:Sys Admin - Can't switch to standby     |
| Source                    | Standby server                                 |
| Frequency                 | Every five minutes as long as condition exists |
| Trap                      |                                                |
| Trap <b>ID</b>            | 64                                             |
| Trap <b>MIB</b> Name      | standbyNotReadyForSwitchover                   |

**4026****Explanation**

The secondary **LSMS** server (Server 1B) is currently providing the **LSMS** service.

**Recovery**

No action required; for information only.

**Event Details****Table B-67 Event 4026 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | None                                           |
| Text                      |                                                |
| Surveillance Notification |                                                |
| Text                      | Notify:Sys Admin - Secondary online            |
| Source                    | Both primary and secondary servers             |
| Frequency                 | Every five minutes as long as condition exists |
| Trap                      |                                                |
| Trap <b>ID</b>            | 65                                             |
| Trap <b>MIB</b> Name      | secServerProvidingLSMSService                  |

**4027****Explanation**

The standby **LSMS** server cannot determine the availability of the **LSMS** service on the active server.

**Recovery**

Determine if the other server is working normally. Also, verify that the heartbeat connections (*eth2*, *eth3*, and the serial cable) are connected and functioning properly

**Event Details****Table B-68 Event 4027 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | None                                           |
| Text                      |                                                |
| Surveillance Notification |                                                |
| Text                      | Notify:Sys Admin - Primary status unknown      |
| Source                    | Standby server                                 |
| Frequency                 | Every five minutes as long as condition exists |
| Trap                      |                                                |
| Trap ID                   | 66                                             |
| Trap MIB Name             | secServerCannotDeterminePrimAvailability       |

**4028****Explanation**

This notification indicates an LSMS mirroring inconsistency.

**Recovery**

Contact My Oracle Support for assistance.

**Event Details****Table B-69 Event 4028 Details**

| GUI Notification          |                                    |
|---------------------------|------------------------------------|
| Severity                  | None                               |
| Text                      |                                    |
| Surveillance Notification |                                    |
| Text                      | Notify:Sys Admin - < volume_name > |
| Source                    | Either server                      |
| Frequency                 | Every 5 minutes                    |
| Trap                      |                                    |
| Trap ID                   | 169                                |
| Trap MIB Name             | IsmsMirroringInconsistance         |

**4029****Explanation**

This notification indicates that the LSMS filesystem is not writeable.

**Recovery**

Contact My Oracle Support for assistance.

**Event Details****Table B-70 Event 4029 Details**

| GUI Notification          |                                   |
|---------------------------|-----------------------------------|
| Severity                  | None                              |
| Text                      |                                   |
| Surveillance Notification |                                   |
| Text                      | Notify:Sys Admin - < fileSystem > |
| Source                    | Either server                     |
| Frequency                 | Every 5 minutes                   |
|                           | Trap                              |
| Trap ID                   | 170                               |
| Trap MIB Name             | IsmsFilesystemNotWritable         |

**4030****Explanation**

The server's swap space has exceeded the major usage threshold (default = 80%).

**Recovery**

If the problem persists, contact My Oracle Support.

**Event Details****Table B-71 Event 4030 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | Major                                          |
| Text                      | Swap Space Warning                             |
| Surveillance Notification |                                                |
| Text                      | Notify:Sys Admin - Swap space warning          |
| Source                    | Both servers                                   |
| Frequency                 | Every five minutes as long as condition exists |
|                           | Trap                                           |
| Trap ID                   | 190                                            |
| Trap MIB Name             | swapSpaceWarning                               |

**4031****Explanation**

A database replication error that was reported earlier by the 4007 event has now been cleared.

**Recovery**

No action necessary.

**Event Details****Table B-72 Event 4031 Details**

| GUI Notification          |                                                   |
|---------------------------|---------------------------------------------------|
| Severity                  | Cleared                                           |
| Text                      | <b>Database</b> Replication cleared - <dbReplErr> |
| Surveillance Notification |                                                   |
| Text                      |                                                   |
| Source                    | None                                              |
| Frequency                 |                                                   |
| Trap                      |                                                   |
| Trap <b>ID</b>            | 195                                               |
| Trap <b>MIB</b> Name      | dataReplClear                                     |

**4032****Explanation**

A database process monitor error that was reported earlier by the 4008 event has now been cleared.

**Recovery**

No action necessary.

**Event Details****Table B-73 Event 4032 Details**

| GUI Notification          |                                                  |
|---------------------------|--------------------------------------------------|
| Severity                  | Cleared                                          |
| Text                      | <b>Database</b> Replication cleared - <dbMonErr> |
| Surveillance Notification |                                                  |
| Text                      |                                                  |
| Source                    | None                                             |
| Frequency                 |                                                  |
| Trap                      |                                                  |
| Trap <b>ID</b>            | 196                                              |
| Trap <b>MIB</b> Name      | dbMonitorClear                                   |

**4033****Explanation**

The LSMS database failed count operation, which suggests a corrupt MySQL index.

**Recovery**

Contact My Oracle Support.

**Event Details****Table B-74 Event 4033 Details**

| GUI Notification          |                        |
|---------------------------|------------------------|
| Severity                  | Critical               |
| Text                      | Database Corrupt Index |
| Surveillance Notification |                        |
| Text                      | None                   |
| Source                    | Both servers           |
| Frequency                 | Every 30 minutes.      |
| Trap                      |                        |
| Trap ID                   | 200                    |
| Trap MIB Name             | dbCorruptIndex         |

**4034****Explanation**

This notification indicates that the Invalid Snapshot has been detected.

**Recovery**

[Clean Up After Failed or Interrupted Snapshot](#)

**Event Details****Table B-75 Event 4034 Details**

| GUI Notification          |                                     |
|---------------------------|-------------------------------------|
| Severity                  | Critical                            |
| Text                      | Invalid Snapshot - <snapName>       |
| Surveillance Notification |                                     |
| Text                      | Notify:Sys Admin - Invalid Snapshot |
| Source                    | Active server                       |
| Frequency                 | Every 30 minutes                    |
| Trap                      |                                     |
| Trap ID                   | 201                                 |
| Trap MIB Name             | snapInvalidErr                      |

**4035****Explanation**

This notification indicates that the Invalid Snapshot error has been cleared.

**Recovery**

No action required; this notification is for information only.

**Event Details****Table B-76 Event 4035 Details**

| GUI Notification          |                                       |
|---------------------------|---------------------------------------|
| Severity                  | Cleared                               |
| Text                      | Invalid Snapshot cleared - <snapName> |
| Surveillance Notification |                                       |
| Text                      | Invalid Snapshot cleared - <snapName> |
| Source                    | Active server                         |
| Frequency                 | Every 30 minutes                      |
| Trap                      |                                       |
| Trap ID                   | 202                                   |
| Trap MIB Name             | snapInvalidClear                      |

**4036****Explanation**

This notification indicates that the Snapshot is greater than 80% full.

**Recovery**

No action required; this notification is for information only.

**Event Details****Table B-77 Event 4036 Details**

| GUI Notification          |                                  |
|---------------------------|----------------------------------|
| Severity                  | Critical                         |
| Text                      | Full Snapshot - <snapName>       |
| Surveillance Notification |                                  |
| Text                      | Notify:Sys Admin - Full Snapshot |
| Source                    | Active server                    |
| Frequency                 | Every 30 minutes                 |
| Trap                      |                                  |
| Trap ID                   | 203                              |
| Trap MIB Name             | fullSnapshot                     |



**4037****Explanation**

This notification indicates that the Snapshot full error is cleared.

**Recovery**

No action required; this notification is for information only.

**Event Details****Table B-78 Event 4037 Details**

| GUI Notification          |                                    |
|---------------------------|------------------------------------|
| Severity                  | Cleared                            |
| Text                      | Full Snapshot cleared - <snapName> |
| Surveillance Notification |                                    |
| Text                      | Full Snapshot cleared - <snapName> |
| Source                    | Active server                      |
| Frequency                 | Every 30 minutes                   |
| Trap                      |                                    |
| Trap ID                   | 204                                |
| Trap MIB Name             | fullSnapshotClear                  |

**4038****Explanation**

The mate server is down.

**Recovery**

Contact My Oracle Support.

**Event Details****Table B-79 Event 4038 Details**

| GUI Notification          |                                          |
|---------------------------|------------------------------------------|
| Severity                  | Critical                                 |
| Text                      | Mate Server Down                         |
| Surveillance Notification |                                          |
| Text                      | Notify:Sys Admin - Mate Server Down      |
| Source                    | Both servers                             |
| Frequency                 | Every minute as long as condition exists |
| Trap                      |                                          |
| Trap ID                   | 205                                      |
| Trap MIB Name             | mateServerDown                           |

**4039****Explanation**

The mate server is up.

**Recovery**

No action is required.

**Event Details****Table B-80 Event 4039 Details**

| GUI Notification          |                                   |
|---------------------------|-----------------------------------|
| Severity                  | Cleared                           |
| Text                      | Mate Server Up                    |
| Surveillance Notification |                                   |
| Text                      | Notify:Sys Admin - Mate Server Up |
| Source                    | Both servers                      |
| Frequency                 | As soon as condition clears       |
| Trap                      |                                   |
| Trap ID                   | 206                               |
| Trap MIB Name             | mateServerUp                      |

**4100****Explanation**

One or more platform alarms in the minor category exists. To determine which minor platform alarms are being reported, see [“How to Decode Platform Alarms”](#). When the active server reports minor platform alarms that originated on the other server, the hostname of the other server is inserted before the alarm string.

**Recovery**

Contact My Oracle Support.

**Note:**

If you received Event 4100 in response to an snmpget error, contact My Oracle Support to have the NAS snmp daemon stopped and restarted.

**Event Details****Table B-81 Event 4100 Details**

| GUI Notification          |                                                        |
|---------------------------|--------------------------------------------------------|
| Severity                  | Minor                                                  |
| Text                      | Minor Platform <b>Alarm</b> [hostname]: <alarm_string> |
| Surveillance Notification |                                                        |

**Table B-81 (Cont.) Event 4100 Details**

|               |                                                |
|---------------|------------------------------------------------|
| Text          | Notify:Sys Admin - <b>ALM</b> <alarm_string>   |
| Source        | Both servers                                   |
| Frequency     | Every five minutes as long as condition exists |
|               | Trap                                           |
| Trap ID       | 191                                            |
| Trap MIB Name | minorPlatAlarmMask                             |

**4101****Explanation**

All platform alarms in the minor category have been cleared. When the active server reports that all minor platform alarms have cleared on the other server, the hostname of the other server is inserted before the alarm string.

**Recovery**

No action necessary.

**Event Details****Table B-82 Event 4101 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | Cleared                                        |
| Text                      | Minor Platform Alarms Cleared                  |
| Surveillance Notification |                                                |
| Text                      | Notify:Sys Admin - Minor Plat alrms clear      |
| Source                    | Both servers                                   |
| Frequency                 | Every five minutes as long as condition exists |
|                           | Trap                                           |
| Trap ID                   | 197                                            |
| Trap MIB Name             | minorPlatAlarmClear                            |

**4200****Explanation**

One or more platform alarms in the major category exists. To determine which major platform alarms are being reported, see [“How to Decode Platform Alarms”](#). When the active server reports major platform alarms that originated on the other server, the hostname of the other server is inserted before the alarm string.

**Recovery**

Contact My Oracle Support.

**Event Details**

**Table B-83 Event 4200 Details**

| GUI Notification          |                                                        |
|---------------------------|--------------------------------------------------------|
| Severity                  | Major                                                  |
| Text                      | Major Platform <b>Alarm</b> [hostname]: <alarm_string> |
| Surveillance Notification |                                                        |
| Text                      | Notify:Sys Admin - <b>ALM</b> <alarm_string>           |
| Source                    | Both servers                                           |
| Frequency                 | Every five minutes as long as condition exists         |
| Trap                      |                                                        |
| Trap ID                   | 192                                                    |
| Trap MIB Name             | majorPlatAlarmMask                                     |

**4201****Explanation**

All platform alarms in the major category have been cleared. When the active server reports that all major platform alarms have cleared on the other server, the hostname of the other server is inserted before the alarm string.

**Recovery**

No action necessary.

**Event Details****Table B-84 Event 4201 Details**

| GUI Notification          |                                           |
|---------------------------|-------------------------------------------|
| Severity                  | Cleared                                   |
| Text                      | Major Platform Alarms Cleared             |
| Surveillance Notification |                                           |
| Text                      | Notify:Sys Admin - Major Plat alrms clear |
| Source                    | Both servers                              |
| Frequency                 | Once                                      |
| Trap                      |                                           |
| Trap ID                   | 198                                       |
| Trap MIB Name             | majorPlatAlarmClear                       |

**4300****Explanation**

One or more platform alarms in the critical category exists. To determine which critical platform alarms are being reported, see [“How to Decode Platform Alarms”](#). When the active server reports critical platform alarms that originated on the other server, the hostname of the other server is inserted before the alarm string.

**Recovery**

Contact My Oracle Support.

### Event Details

**Table B-85 Event 4300 Details**

| GUI Notification          |                                                           |
|---------------------------|-----------------------------------------------------------|
| Severity                  | Critical                                                  |
| Text                      | Critical Platform <b>Alarm</b> [hostname]: <alarm_string> |
| Surveillance Notification |                                                           |
| Text                      | Notify:Sys Admin - <b>ALM</b> <alarm_string>              |
| Source                    | Both servers                                              |
| Frequency                 | Once                                                      |
| Trap                      |                                                           |
| Trap ID                   | 193                                                       |
| Trap MIB Name             | criticalPlatAlarmMask                                     |

### 4301

#### Explanation

All platform alarms in the major category have been cleared. When the active server reports that all major platform alarms have cleared on the other server, the hostname of the other server is inserted before the alarm string.

#### Recovery

No action necessary.

### Event Details

**Table B-86 Event 4301 Details**

| GUI Notification          |                                          |
|---------------------------|------------------------------------------|
| Severity                  | Cleared                                  |
| Text                      | Critical Platform Alarms Cleared         |
| Surveillance Notification |                                          |
| Text                      | Notify:Sys Admin - Crit Plat alrms clear |
| Source                    | Both servers                             |
| Frequency                 | Once                                     |
| Trap                      |                                          |
| Trap ID                   | 199                                      |
| Trap MIB Name             | criticalPlatAlarmClear                   |

### 6000

#### Explanation

The `eagleagent` process has been started.

#### Recovery

No action required; for information only.

### Event Details

**Table B-87 Event 6000 Details**

| GUI Notification          |                                    |
|---------------------------|------------------------------------|
| Severity                  | Cleared                            |
| Text                      | Eagleagent <CLLI> Has Been Started |
| Surveillance Notification |                                    |
| Text                      | Notify:Sys Admin - <CLLI> started  |
| Source                    | Active server                      |
| Frequency                 | Once, as soon as condition occurs  |
| Trap                      |                                    |
| Trap ID                   | 1                                  |
| Trap MIB Name             | eagleAgentStarted                  |

### 6001

#### Explanation

The `eagleagent` process has been stopped by the `eagle` script.

#### Recovery

No action required; for information only.

### Event Details

**Table B-88 Event 6001 Details**

| GUI Notification          |                                            |
|---------------------------|--------------------------------------------|
| Severity                  | Critical                                   |
| Text                      | Eagleagent <CLLI> Has Been Stopped by User |
| Surveillance Notification |                                            |
| Text                      | Notify:Sys Admin - <CLLI> norm exit        |
| Source                    | Active server                              |
| Frequency                 | Once, as soon as condition occurs          |
| Trap                      |                                            |
| Trap ID                   | 2                                          |
| Trap MIB Name             | eagleAgentStoppedbyscript                  |

### 6002

#### Explanation

The `npacagent` for the region indicated by <NPAC\_region\_ID> has been started.

#### Recovery

No action required; for information only.

## Event Details

Table B-89 Event 6002 Details

|               |                                                                          |
|---------------|--------------------------------------------------------------------------|
|               | GUI Notification                                                         |
| Severity      | Cleared                                                                  |
| Text          | <b>NPACagent</b> Has Been Started                                        |
|               | Surveillance Notification                                                |
| Text          | Notify:Sys Admin - < <b>NPAC_region_ID</b> ><br><b>NPACagent</b> started |
| Source        | Active server                                                            |
| Frequency     | Once, as soon as condition occurs                                        |
|               | Trap                                                                     |
| Trap ID       | 3                                                                        |
| Trap MIB Name | <b>NPACagentStarted</b>                                                  |

## 6003

## Explanation

The `npacagent` for the region indicated by <region> has been stopped using the `lsms` command.

## Recovery

No action required; for information only. If you desire to restart the agent, do the following:

1. Log in to the active server as `lsmsadm`.
2. Enter the following commands to start the `npacagent` where <region> is the name of the **NPAC** region:

```
$ cd $LSMS_DIR
$ lsms start <region>
```

## Event Details

Table B-90 Event 6003 Details

|               |                                                        |
|---------------|--------------------------------------------------------|
|               | GUI Notification                                       |
| Severity      | Critical                                               |
| Text          | <b>NPACagent</b> Has Been Stopped by User              |
|               | Surveillance Notification                              |
| Text          | Notify:Sys Admin - < <b>NPAC_region_ID</b> > norm exit |
| Source        | Active server                                          |
| Frequency     | Once, as soon as condition occurs                      |
|               | Trap                                                   |
| Trap ID       | 4                                                      |
| Trap MIB Name | <code>lsmsCommandStoppedNPACagent</code>               |

**6004****Explanation**

The `eagleagent` process for the network element identified by `<CLLI>` has failed. The `sentryd` process will attempt to restart.

**Recovery**

No action required; the `sentryd` process will attempt to restart the `eagleagent` process.

**Event Details****Table B-91 Event 6004 Details**

| GUI Notification          |                                                             |
|---------------------------|-------------------------------------------------------------|
| Severity                  | Critical                                                    |
| Text                      | Eagleagent [ <code>&lt;CLLI&gt;</code> ] Has Failed         |
| Surveillance Notification |                                                             |
| Text                      | Notify:Sys Admin - <b>FAILED:</b> <code>&lt;CLLI&gt;</code> |
| Source                    | Active server                                               |
| Frequency                 | Once, as soon as condition occurs                           |
| Trap                      |                                                             |
| Trap ID                   | 74                                                          |
| Trap MIB Name             | IsmsEagleAgentFailed                                        |

**6005****Explanation**

The `eagleagent` process for the network element identified by `<CLLI>` has been successfully restarted by the `sentryd` process.

**Recovery**

No action required.

**Event Details****Table B-92 Event 6005 Details**

| GUI Notification          |                                                            |
|---------------------------|------------------------------------------------------------|
| Severity                  | None                                                       |
| Text                      |                                                            |
| Surveillance Notification |                                                            |
| Text                      | Notify:Sys Admin - <b>RECOV:</b> <code>&lt;CLLI&gt;</code> |
| Source                    | Active server                                              |
| Frequency                 | Once, as soon as condition occurs                          |
| Trap                      |                                                            |
| Trap ID                   | 75                                                         |
| Trap MIB Name             | IsmsEagleAgentRestarted                                    |



**6006****Explanation**

The `sentryd` process was unable to restart the `eagleagent` process for the network element identified by `<CLLI>`.

**Recovery**

Contact My Oracle Support.

**Event Details****Table B-93 Event 6006 Details**

| GUI Notification          |                                                               |
|---------------------------|---------------------------------------------------------------|
| Severity                  | Critical                                                      |
| Text                      | Failure Restarting Eagleagent [ <code>&lt;CLLI&gt;</code> ]   |
| Surveillance Notification |                                                               |
| Text                      | Notify:Sys Admin - <b>RFAILED</b> : <code>&lt;CLLI&gt;</code> |
| Source                    | Active server                                                 |
| Frequency                 | Once, as soon as condition occurs                             |
| Trap                      |                                                               |
| Trap ID                   | 76                                                            |
| Trap MIB Name             | failureToRestartEagleAgent                                    |

**6008****Explanation**

The `npacagent` process for the region specified by `<NPAC_region_ID>` has failed. The `sentryd` process will attempt to restart.

**Recovery**

No action required; the `sentryd` process will attempt to restart the `npacagent` process.

**Event Details****Table B-94 Event 6008 Details**

| GUI Notification          |                                                                              |
|---------------------------|------------------------------------------------------------------------------|
| Severity                  | Critical                                                                     |
| Text                      | <b>NPACagent</b> [ <code>&lt;NPAC_region_ID&gt;</code> ] Failure             |
| Surveillance Notification |                                                                              |
| Text                      | Notify:Sys Admin - <b>FAILED</b> : <code>&lt;NPAC_region_ID&gt;</code> agent |
| Source                    | Active server                                                                |
| Frequency                 | Once, as soon as condition occurs                                            |
| Trap                      |                                                                              |
| Trap ID                   | 78                                                                           |

**Table B-94 (Cont.) Event 6008 Details**

|               |                           |
|---------------|---------------------------|
| Trap MIB Name | NPACagentForRegionFailure |
|---------------|---------------------------|

**6009****Explanation**

The `npacagent` process for the region specified by `<NPAC_region_ID>` has been successfully restarted by the `sentryd` process.

**Recovery**

No action required. Any active **LSMS GUI** processes will automatically reconnect.

**Event Details****Table B-95 Event 6009 Details**

| GUI Notification          |                                                                               |
|---------------------------|-------------------------------------------------------------------------------|
| Severity                  | None                                                                          |
| Text                      |                                                                               |
| Surveillance Notification |                                                                               |
| Text                      | Notify:Sys Admin - <b>RECOV:</b> <code>&lt;NPAC_region_ID&gt;</code><br>agent |
| Source                    | Active server                                                                 |
| Frequency                 | Once, as soon as condition occurs                                             |
| Trap                      |                                                                               |
| Trap ID                   | 79                                                                            |
| Trap MIB Name             | NPACagentForRegionRestarted                                                   |

**6010****Explanation**

The `sentryd` process was unable to restart the `npacagent` process for the region specified by `<NPAC_region_ID>`.

**Recovery**

Contact My Oracle Support.

**Event Details****Table B-96 Event 6010 Details**

| GUI Notification          |                                                                                |
|---------------------------|--------------------------------------------------------------------------------|
| Severity                  | Critical                                                                       |
| Text                      | Failure Restarting <b>NPACagent</b><br>[ <code>&lt;NPAC_region_ID&gt;</code> ] |
| Surveillance Notification |                                                                                |

**Table B-96 (Cont.) Event 6010 Details**

|               |                                                          |
|---------------|----------------------------------------------------------|
| Text          | Notify:Sys Admin - <b>RFAILD:</b> <NPAC_region_ID> agent |
| Source        | Active server                                            |
| Frequency     | Once, as soon as condition occurs                        |
|               | Trap                                                     |
| Trap ID       | 80                                                       |
| Trap MIB Name | failureToRestartNPACagentRegion                          |

**6020****Explanation**

The `npacagent` process has been stopped due to a fault in accessing the regional database.

**Recovery**

A database error has occurred. Contact My Oracle Support.

**Event Details****Table B-97 Event 6020 Details**

|               |                                                                    |
|---------------|--------------------------------------------------------------------|
|               | <b>GUI Notification</b>                                            |
| Severity      | Critical                                                           |
| Text          | <b>NPACagent</b> Has Been Shut Down - <b>Database</b> Access Error |
|               | <b>Surveillance Notification</b>                                   |
| Text          | Notify:Sys Admin - <NPAC_region_ID> <b>DB</b> error                |
| Source        | Active server                                                      |
| Frequency     | Once, as soon as condition occurs                                  |
|               | Trap                                                               |
| Trap ID       | 189                                                                |
| Trap MIB Name | <b>NPACagentStopRegDBaccessFault</b>                               |

**8000****Explanation**

The **LSMS** Surveillance feature is in operation.

**Recovery**

No action required; for information only.

**Event Details****Table B-98 Event 8000 Details**

|          |                         |
|----------|-------------------------|
|          | <b>GUI Notification</b> |
| Severity | None                    |

**Table B-98 (Cont.) Event 8000 Details**

|               |                                                |
|---------------|------------------------------------------------|
| Text          | Surveillance Notification                      |
| Text          | Keep alive                                     |
| Source        | Both primary and secondary servers             |
| Frequency     | Every five minutes as long as condition exists |
|               | Trap                                           |
| Trap ID       | 19                                             |
| Trap MIB Name | survFeatureOn                                  |

**8001****Explanation**

The network element resynchronization database contains more than 1 million entries.

**Recovery**

Each day, as part of a cron job, the **LSMS** trims the resynchronization database so that it contains 768,000 entries. The occurrence of this event means that more than 232,000 transactions have been received since the last cron job. If this event occurs early in the day, contact My Oracle Support.

**Event Details****Table B-99 Event 8001 Details**

|               |                                   |
|---------------|-----------------------------------|
|               | GUI Notification                  |
| Severity      | Major                             |
| Text          | ResyncDB Contains 1 Mil Entries   |
|               | Surveillance Notification         |
| Text          | Notify:Sys Admin - ResyncDB 1 Mil |
| Source        | Active server                     |
| Frequency     | Once                              |
|               | Trap                              |
| Trap ID       | 34                                |
| Trap MIB Name | resynchLogMidFull                 |

**8003****Explanation**

The pending queue, used to hold the transactions to send to the network element (which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces <**CLLI**> in the Surveillance notification text), is over half full.

**Recovery**

No recovery is required. Informational only.

**Event Details**

**Table B-100 Event 8003 Details**

| GUI Notification          |                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------|
| Severity                  | Major                                                                                 |
| Text                      | <b>EMS</b> Pending Queue Is Half full                                                 |
| Surveillance Notification |                                                                                       |
| Text                      | Notify:Sys Admin - <b>CLLI</b> =< <b>CLLI</b> >                                       |
| Source                    | Active server                                                                         |
| Frequency                 | As soon as condition occurs, and at five-minute intervals as long as condition exists |
| Trap                      |                                                                                       |
| Trap <b>ID</b>            | 43                                                                                    |
| Trap <b>MIB</b> Name      | ensPendingQueueHalfFull                                                               |

**8004****Explanation**

The pending queue, used to hold the transactions to send to the network element (which is indicated in the System field on the **GUI** or whose **CLLI** has the value that replaces <**CLLI**> in the Surveillance notification text), is completely full. The association to that **EMS** will be broken.

**Recovery**

No manual recovery required. The **LSMS** will automatically re-establish the association to the **EMS** and synchronization will take place.

**Event Details****Table B-101 Event 8004 Details**

| GUI Notification          |                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------|
| Severity                  | Critical                                                                              |
| Text                      | <b>EMS</b> Pending Queue Is Full                                                      |
| Surveillance Notification |                                                                                       |
| Text                      | Notify:Sys Admin - <b>CLLI</b> =< <b>CLLI</b> >                                       |
| Source                    | Active server                                                                         |
| Frequency                 | As soon as condition occurs, and at five-minute intervals as long as condition exists |
| Trap                      |                                                                                       |
| Trap <b>ID</b>            | 44                                                                                    |
| Trap <b>MIB</b> Name      | emsPendingQueueMaxReached                                                             |

**8005****Explanation**

There was a data error in a record that prevented the **LSMS** eagleagent from sending the record to the network element.

**Recovery**

Both the error and the ignored record are written to the file `/var/TKLC/lsmss/logs/trace/LsmssTrace.log.<mmdd>`, where `<mmdd>` indicates the month and day the error occurred. Examine the log file for the month and day this error was reported to determine what the error was. Enter the data manually or send it again.

### Event Details

**Table B-102 Event 8005 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | Minor                                          |
| Text                      | Eagleagent <CLLI> Ignoring Record: <DataError> |
| Surveillance Notification |                                                |
| Text                      |                                                |
| Source                    | None                                           |
| Frequency                 |                                                |
|                           | Trap                                           |
| Trap ID                   | 46                                             |
| Trap MIB Name             | eagleAgentIgnoredRecord                        |

**8024**

### Explanation

The Service Assurance agent has started successfully.

### Recovery

No action required; for information only.

### Event Details

**Table B-103 Event 8024 Details**

| GUI Notification          |                                   |
|---------------------------|-----------------------------------|
| Severity                  | None                              |
| Text                      |                                   |
| Surveillance Notification |                                   |
| Text                      | Notify:Sys Admin                  |
| Source                    | Active server                     |
| Frequency                 | Once, as soon as condition occurs |
|                           | Trap                              |
| Trap ID                   | 67                                |
| Trap MIB Name             | serviceAssuranceAgentStarted      |

**8025**

### Explanation

**Association** with the Service Assurance Manager, identified by `<Service_Assurance_Manager_Name>`, has been established successfully.

**Recovery**

No action required; for information only.

**Event Details****Table B-104 Event 8025 Details**

| GUI Notification          |                                                        |
|---------------------------|--------------------------------------------------------|
| Severity                  | None                                                   |
| Text                      |                                                        |
| Surveillance Notification |                                                        |
| Text                      | Notify:Sys Admin -<br><Service_Assurance_Manager_Name> |
| Source                    | Active server                                          |
| Frequency                 | Once, as soon as condition occurs                      |
| Trap                      |                                                        |
| Trap ID                   | 68                                                     |
| Trap MIB Name             | establishServAssuranceMgrAssoc                         |

**8026****Explanation**

**Association** with the Service Assurance Manager, identified by <Service\_Assurance\_Manager\_Name>, has been stopped or disconnected.

**Recovery**

Contact the Service Assurance system administrator to determine the cause of disconnection, then have Service Assurance system administrator reassociate the Service Assurance Manager to the Service Assurance Agent.

**Event Details****Table B-105 Event 8026 Details**

| GUI Notification          |                                                        |
|---------------------------|--------------------------------------------------------|
| Severity                  | None                                                   |
| Text                      |                                                        |
| Surveillance Notification |                                                        |
| Text                      | Notify:Sys Admin -<br><Service_Assurance_Manager_Name> |
| Source                    | Active server                                          |
| Frequency                 | Once, as soon as condition occurs                      |
| Trap                      |                                                        |
| Trap ID                   | 69                                                     |
| Trap MIB Name             | servAssuranceMgrAssocBroken                            |

**8027****Explanation**

The Service Assurance agent is not currently running.

**Recovery**

No action required; the Service Assurance agent should be restarted automatically.

**Event Details****Table B-106 Event 8027 Details**

| GUI Notification          |                                   |
|---------------------------|-----------------------------------|
| Severity                  | None                              |
| Text                      |                                   |
| Surveillance Notification |                                   |
| Text                      | Notify:Sys Admin                  |
| Source                    | Active server                     |
| Frequency                 | Once, as soon as condition occurs |
| Trap                      |                                   |
| Trap ID                   | 70                                |
| Trap MIB Name             | servAssuranceAgentNotRunning      |

**8030****Explanation**

This notification indicates that the LSMS is not able to confirm physical connectivity with the DCM.

**Recovery**

Contact My Oracle Support for assistance.

**Event Details****Table B-107 Event 8030 Details**

| GUI Notification          |                                                  |
|---------------------------|--------------------------------------------------|
| Severity                  | Critical                                         |
| Text                      | EBDA Physical Connection Lost                    |
| Surveillance Notification |                                                  |
| Text                      | Notify:Sys Admin - NE=< NE CLLI > EBDA conn lost |
| Source                    | Active server                                    |
| Frequency                 | Every 5 minutes                                  |
| Trap                      |                                                  |
| Trap ID                   | 73                                               |
| Trap MIB Name             | noPhysicalConnectivityToDCM                      |

**8037****Explanation**



The **OSI** process has failed. The `sentryd` process will attempt to restart.

### Recovery

No action required; the `sentryd` process will attempt to restart the failed process.

### Event Details

**Table B-108 Event 8037 Details**

| GUI Notification          |                                       |
|---------------------------|---------------------------------------|
| Severity                  | None                                  |
| Text                      |                                       |
| Surveillance Notification |                                       |
| Text                      | Notify:Sys Admin - <b>FAILED: OSI</b> |
| Source                    | Active server                         |
| Frequency                 | Once, as soon as condition occurs     |
|                           | Trap                                  |
| Trap ID                   | 88                                    |
| Trap MIB Name             | osiDaemonFailure                      |

## 8038

### Explanation

The **OSI** process has been successfully restarted by the `sentryd` process.

### Recovery

No action required. The `sentryd` process will attempt to restart the `npacagent` processes for all active regions. Any active **LSMS GUI** processes will automatically reconnect.

### Event Details

**Table B-109 Event 8038 Details**

| GUI Notification          |                                      |
|---------------------------|--------------------------------------|
| Severity                  | None                                 |
| Text                      |                                      |
| Surveillance Notification |                                      |
| Text                      | Notify:Sys Admin - <b>RECOV: OSI</b> |
| Source                    | Active server                        |
| Frequency                 | Once, as soon as condition occurs    |
|                           | Trap                                 |
| Trap ID                   | 89                                   |
| Trap MIB Name             | osiDaemonRestarted                   |

## 8039

### Explanation

The `sentryd` process was not able to restart the **OSI** process.

**Recovery**

Contact My Oracle Support.

**Event Details****Table B-110 Event 8039 Details**

| GUI Notification          |                                        |
|---------------------------|----------------------------------------|
| Severity                  | None                                   |
| Text                      |                                        |
| Surveillance Notification |                                        |
| Text                      | Notify:Sys Admin - <b>RFAILED: OSI</b> |
| Source                    | Active server                          |
| Frequency                 | Once, as soon as condition occurs      |
|                           | Trap                                   |
| Trap <b>ID</b>            | 90                                     |
| Trap <b>MIB</b> Name      | osiDaemonRestartFailure                |

**8040****Explanation**

The Surveillance feature has detected that the `sentryd` process is no longer running.

**Recovery**

No action required; the **LSMS HA** software will attempt to restart the `sentryd` process.

**Event Details****Table B-111 Event 8040 Details**

| GUI Notification          |                                           |
|---------------------------|-------------------------------------------|
| Severity                  | None                                      |
| Text                      |                                           |
| Surveillance Notification |                                           |
| Text                      | Notify:Sys Admin - <b>FAILED: sentryd</b> |
| Source                    | Active server                             |
| Frequency                 | Once, as soon as condition occurs         |
|                           | Trap                                      |
| Trap <b>ID</b>            | 91                                        |
| Trap <b>MIB</b> Name      | sentrydFailure                            |

**8041****Explanation**

This notification indicates that the surveillance process has detected that the Legacy IddAgent process has restarted and all functionality has resumed.

**Recovery**

No action required; this notification is for information only.

### Event Details

**Table B-112 Event 8041 Details**

| GUI Notification          |                                           |
|---------------------------|-------------------------------------------|
| Severity                  | None                                      |
| Text                      |                                           |
| Surveillance Notification |                                           |
| Text                      | Notify:Sys Admin - RECOV: IddAgent legacy |
| Source                    | Both servers                              |
| Frequency                 | Once, as soon as the condition occurs     |
|                           | Trap                                      |
| Trap ID                   | 92                                        |
| Trap MIB Name             | IddAgentRestarted                         |

### 8042

#### Explanation

This notification indicates that the surveillance process has detected that the SCPMS IddAgent process has restarted and all functionality has resumed.

#### Recovery

No action required; this notification is for information only.

### Event Details

**Table B-113 Event 8042 Details**

| GUI Notification          |                                          |
|---------------------------|------------------------------------------|
| Severity                  | None                                     |
| Text                      |                                          |
| Surveillance Notification |                                          |
| Text                      | Notify:Sys Admin - RECOV: IddAgent scpms |
| Source                    | Both servers                             |
| Frequency                 | Once, as soon as the condition occurs    |
|                           | Trap                                     |
| Trap ID                   | 93                                       |
| Trap MIB Name             | scpmsIddAgentRestarted                   |

### 8044

#### Explanation

This notification indicates that the LDD SCPMS Confirmation of Arrival message retry attempts have been exhausted. The MQSeries interface is not operational or network connectivity to the remote system is lost.

#### Recovery

Contact My Oracle Support for assistance.

### Event Details

**Table B-114 Event 8044 Details**

| GUI Notification          |                                        |
|---------------------------|----------------------------------------|
| Severity                  | Critical                               |
| Text                      | LDD SCPMS COA Retry Attempts Exhausted |
| Surveillance Notification |                                        |
| Text                      | None                                   |
| Source                    |                                        |
| Frequency                 |                                        |
|                           | Trap                                   |
| Trap ID                   | 116                                    |
| Trap MIB Name             | scpmsMqSeriesFault                     |

### 8045

#### Explanation

This notification indicates that the LDD SCPMS system has not provided a response within the time limit specified by the LDD\_SCP\_SYSTEM\_RESPONSE\_TIMEOUT configuration parameter. The SCPMS system is not active.

#### Recovery

Contact My Oracle Support for assistance.

### Event Details

**Table B-115 Event 8045 Details**

| GUI Notification          |                                             |
|---------------------------|---------------------------------------------|
| Severity                  | Critical                                    |
| Text                      | LDD SCPMS Response Retry Attempts Exhausted |
| Surveillance Notification |                                             |
| Text                      | None                                        |
| Source                    |                                             |
| Frequency                 |                                             |
|                           | Trap                                        |
| Trap ID                   | 117                                         |
| Trap MIB Name             | scpmsNotActive                              |

### 8046

#### Explanation

This notification indicates that the LDD Legacy Confirmation of Arrival message retry attempts have been exhausted.

The MQSeries interface is not operational or network connectivity to the remote system is lost.

**Recovery**

Contact My Oracle Support for assistance.

**Event Details****Table B-116 Event 8046 Details**

| GUI Notification |                                        |
|------------------|----------------------------------------|
| Severity         | Critical                               |
| Text             | LDD SCPMS COA Retry Attempts Exhausted |
|                  | Surveillance Notification              |
| Text             | None                                   |
| Source           |                                        |
| Frequency        |                                        |
|                  | Trap                                   |
| Trap ID          | 118                                    |
| Trap MIB Name    | legacyMqSeriesFault                    |

**8047****Explanation**

This notification indicates that the LDD Legacy system has not provided a response within the time limit specified by the LDD\_SCP\_SYSTEM\_RESPONSE\_TIMEOUT configuration parameter. The SCPMS system is not active.

**Recovery**

Contact My Oracle Support for assistance.

**Event Details****Table B-117 Event 8047 Details**

| GUI Notification |                                              |
|------------------|----------------------------------------------|
| Severity         | Critical                                     |
| Text             | LDD Legacy Response Retry Attempts Exhausted |
|                  | Surveillance Notification                    |
| Text             | None                                         |
| Source           |                                              |
| Frequency        |                                              |
|                  | Trap                                         |
| Trap ID          | 119                                          |
| Trap MIB Name    | scpmsLegacyNotActive                         |

**8048****Explanation**

This notification indicates that a connection could not be made to the MQSeries local queue manager. The local queue manager is not started or operational.

**Recovery**

Contact My Oracle Support for assistance.

**Event Details****Table B-118 Event 8048 Details**

| GUI Notification          |                                                         |
|---------------------------|---------------------------------------------------------|
| Severity                  | Critical                                                |
| Text                      | Unable to Connect to Queue Manager:<br>< queueMgrName > |
| Surveillance Notification |                                                         |
| Text                      | None                                                    |
| Source                    |                                                         |
| Frequency                 |                                                         |
| Trap                      |                                                         |
| Trap ID                   | 120                                                     |
| Trap MIB Name             | mqSeriesQueueManagerNotActive                           |

**8049****Explanation**

The **EMS/NE** has rejected the **NPANXX GTT** creation, deletion, or modification transaction, and the **NPANXX** value in the transaction could not be determined.

**Recovery**

Look in the transaction log file, `/var/TKLC/lsmss/logs/<CLLI>/LsmssTrans.log.MMDD`, and locate the **NE's** response to the **NPANXX GTT** command to determine why the command failed. Re-enter the **NPANXX GTT** data correctly, which will cause the **LSMS** to try to command again.

**Event Details****Table B-119 Event 8049 Details**

| GUI Notification          |                                                      |
|---------------------------|------------------------------------------------------|
| Severity                  | Major                                                |
| Text                      | <CLLI>: <b>NPANXX GTT</b> <type_of_operation> Failed |
| Surveillance Notification |                                                      |
| Text                      |                                                      |
| Source                    | None                                                 |
| Frequency                 |                                                      |
| Trap                      |                                                      |
| Trap ID                   | 126                                                  |
| Trap MIB Name             | npnxxGTTValueNotFound                                |

**8050****Explanation**

The **EMS/NE** has rejected the **NPANXX GTT** creation, deletion, or modification transaction for the specified **NPANXX** value.

**Recovery**

Look in the transaction log file, `/var/TKLC/lsmss/logs/<CLLI>/LsmssTrans.log.MMDD`, and locate the **NE**'s response to the **NPANXX GTT** command to determine why the command failed. Re-enter the **NPANXX GTT** data correctly, which will cause the **LSMS** to try to command again.

**Event Details****Table B-120 Event 8050 Details**

| GUI Notification          |                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------|
| Severity                  | Major                                                                                 |
| Text                      | <CLLI>: <b>NPANXX GTT</b> <type_of_operation> Failed for <b>NPANXX</b> <NPANXX_value> |
| Surveillance Notification |                                                                                       |
| Text                      |                                                                                       |
| Source                    | None                                                                                  |
| Frequency                 |                                                                                       |
| Trap                      |                                                                                       |
| Trap ID                   | 127                                                                                   |
| Trap MIB Name             | npnxxGTTValueRejected                                                                 |

**8051****Explanation**

The **EMS/NE** has rejected the Override **GTT** creation, deletion, or modification transaction, and the **LRN** value in the transaction could not be determined.

**Recovery**

Look in the transaction log file, `/var/TKLC/lsmss/logs/<CLLI>/LsmssTrans.log.MMDD`, and locate the **NE**'s response to the Override **GTT** command to determine why the command failed. Re-enter the Override **GTT** data correctly, which will cause the **LSMS** to try to command again.

**Event Details****Table B-121 Event 8051 Details**

| GUI Notification          |                                                        |
|---------------------------|--------------------------------------------------------|
| Severity                  | Major                                                  |
| Text                      | <CLLI>: Override <b>GTT</b> <type_of_operation> Failed |
| Surveillance Notification |                                                        |
| Text                      | None                                                   |

Table B-121 (Cont.) Event 8051 Details

|               |                          |
|---------------|--------------------------|
| Source        |                          |
| Frequency     |                          |
|               | Trap                     |
| Trap ID       | 128                      |
| Trap MIB Name | overrideGTTValueNotFound |

**8052****Explanation**

The **EMS/NE** has rejected the Override **GTT** creation, deletion, or modification transaction for the specified **LRN** value.

**Recovery**

Look in the transaction log file, `/var/TKLC/lsmc/logs/<CLLI>/LsmcTrans.log.MMDD`, and locate the **NE**'s response to the Override **GTT** command to determine why the command failed. Re-enter the Override **GTT** data correctly, which will cause the **LSMS** to try to command again.

**Event Details**

Table B-122 Event 8052 Details

|               |                                                                                   |
|---------------|-----------------------------------------------------------------------------------|
|               | GUI Notification                                                                  |
| Severity      | Major                                                                             |
| Text          | <CLLI>: Override <b>GTT</b> <type_of_operation> Failed for <b>LRN</b> <LRN_value> |
|               | Surveillance Notification                                                         |
| Text          |                                                                                   |
| Source        | None                                                                              |
| Frequency     |                                                                                   |
|               | Trap                                                                              |
| Trap ID       | 129                                                                               |
| Trap MIB Name | overrideGTTValueRejected                                                          |

**8053****Explanation**

The **LSMS** was not able to complete the automatic synchronization with the **EMS/NE**. Possible reasons include:

- The network failed temporarily but not long enough to cause the association with the **EMS** to fail.
- The **EMS/NE** rejected the data because it is busy updating its databases.

**Recovery**



Verify the connection between the **LSMS** and the **EMS**; then reinitialize the **MPS**. If this notification appears again, perform one of the bulk download procedures in the *LNP Database Synchronization User's Guide*.

#### Event Details

**Table B-123 Event 8053 Details**

| GUI Notification          |                              |
|---------------------------|------------------------------|
| Severity                  | Major                        |
| Text                      | Short Synchronization Failed |
| Surveillance Notification |                              |
| Text                      |                              |
| Source                    | None                         |
| Frequency                 |                              |
| Trap                      |                              |
| Trap ID                   | 131                          |
| Trap MIB Name             | unableToCompleteAutoResynch  |

#### 8054

##### Explanation

The **LSMS** has started its automatic synchronization with the **EMS/NE**.

##### Recovery

No action required; for information only.

#### Event Details

**Table B-124 Event 8054 Details**

| GUI Notification          |                               |
|---------------------------|-------------------------------|
| Severity                  | Major                         |
| Text                      | Short Synchronization Started |
| Surveillance Notification |                               |
| Text                      |                               |
| Source                    | None                          |
| Frequency                 |                               |
| Trap                      |                               |
| Trap ID                   | 132                           |
| Trap MIB Name             | autoResynchNEStarted          |

#### 8055

##### Explanation

The automatic resynchronization of databases after an outage between the **LSMS** and the **NPAC** has completed successfully.

##### Recovery

No action required; for information only.

### Event Details

**Table B-125 Event 8055 Details**

| GUI Notification          |                    |
|---------------------------|--------------------|
| Severity                  | Cleared            |
| Text                      | Recovery Complete  |
| Surveillance Notification |                    |
| Text                      |                    |
| Source                    | None               |
| Frequency                 |                    |
|                           | Trap               |
| Trap ID                   | 133                |
| Trap MIB Name             | dbResynchCompleted |

### 8059

#### Explanation

The **LSMS** has completed its automatic synchronization with the **EMS/NE**.

#### Recovery

No action required; for information only.

### Event Details

**Table B-126 Event 8059 Details**

| GUI Notification          |                                |
|---------------------------|--------------------------------|
| Severity                  | Cleared                        |
| Text                      | Short Synchronization Complete |
| Surveillance Notification |                                |
| Text                      |                                |
| Source                    | None                           |
| Frequency                 |                                |
|                           | Trap                           |
| Trap ID                   | 138                            |
| Trap MIB Name             | emsShortSynchCompleted         |

### 8060

#### Explanation

The **EMS** pending queue used to hold the transactions to send to the **EMS/NE** identified by <CLLI> in the Surveillance notification, has fallen sufficiently below the halfway full point.

#### Recovery

No action required; for information only.

## Event Details

**Table B-127 Event 8060 Details**

| GUI Notification          |                                                 |
|---------------------------|-------------------------------------------------|
| Severity                  | Cleared                                         |
| Text                      | <b>EMS</b> Pending Queue Less Than Half Full    |
| Surveillance Notification |                                                 |
| Text                      | Notify:Sys Admin - <b>CLLI</b> =< <b>CLLI</b> > |
| Source                    | Active server                                   |
| Frequency                 | Once, as soon as condition occurs               |
| Trap                      |                                                 |
| Trap ID                   | 141                                             |
| Trap MIB Name             | pendingQueueHalfFull                            |

### 8061

#### Explanation

The **EMS** pending queue used to hold the transactions to send to the **EMS/NE** identified by <**CLLI**> in the Surveillance notification, has fallen sufficiently below the full point.

#### Recovery

No action required; for information only.

#### Event Details

**Table B-128 Event 8061 Details**

| GUI Notification          |                                                 |
|---------------------------|-------------------------------------------------|
| Severity                  | Cleared                                         |
| Text                      | <b>EMS</b> Pending Queue No Longer Full         |
| Surveillance Notification |                                                 |
| Text                      | Notify:Sys Admin - <b>CLLI</b> =< <b>CLLI</b> > |
| Source                    | Active server                                   |
| Frequency                 | Once, as soon as condition occurs               |
| Trap                      |                                                 |
| Trap ID                   | 142                                             |
| Trap MIB Name             | pendingQueueNotFull                             |

### 8062

#### Explanation

This notification indicates that physical connection has been restored with the DCM.

#### Recovery

No action required; for information only.

#### Event Details

**Table B-129 Event 8062 Details**

| GUI Notification          |                                   |
|---------------------------|-----------------------------------|
| Severity                  | Cleared                           |
| Text                      | EBDA Physical Connection Restored |
| Surveillance Notification |                                   |
| Text                      | None                              |
| Source                    |                                   |
| Frequency                 |                                   |
| Trap                      |                                   |
| Trap ID                   | 143                               |
| Trap MIB Name             | dcmConnectionRestored             |

**8063****Explanation**

This notification indicates that the connection to the MQSeries local queue manager has been established following an outage.

**Recovery**

No action required; for information only.

**Event Details****Table B-130 Event 8063 Details**

| GUI Notification          |                                              |
|---------------------------|----------------------------------------------|
| Severity                  | Cleared                                      |
| Text                      | Connected to Queue Manager: < queueMgrName > |
| Surveillance Notification |                                              |
| Text                      | None                                         |
| Source                    |                                              |
| Frequency                 |                                              |
| Trap                      |                                              |
| Trap ID                   | 144                                          |
| Trap MIB Name             | connToMqSeriesQueueMgrRest                   |

**8064****Explanation**

The specified **NPA-NXX** is opened for portability starting at the value of the <EffectiveTimestamp> field.

**Recovery**

No action required; for information only.

## Event Details

**Table B-131 Event 8064 Details**

| GUI Notification          |                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------|
| Severity                  | Event                                                                                          |
| Text                      | New <b>NPA-NXX</b> : <b>SPID</b> [<SPID>], <b>NPANXX</b> [<NPANXX>], TS [<EffectiveTimestamp>] |
| Surveillance Notification |                                                                                                |
| Text                      |                                                                                                |
| Source                    | None                                                                                           |
| Frequency                 |                                                                                                |
| Trap                      |                                                                                                |
| Trap <b>ID</b>            | 145                                                                                            |
| Trap <b>MIB</b> Name      | npaNxxOpenedForPortabilityAtTS                                                                 |

### 8065

#### Explanation

The first telephone number in the specified **NPA-NXX** is ported starting at the value of the <EffectiveTimestamp> field.

#### Recovery

No action required; for information only.

## Event Details

**Table B-132 Event 8065 Details**

| GUI Notification          |                                                                                                         |
|---------------------------|---------------------------------------------------------------------------------------------------------|
| Severity                  | Event                                                                                                   |
| Text                      | First use of <b>NPA-NXX</b> : <b>SPID</b> [<SPID>], <b>NPANXX</b> [<NPANXX>], TS [<EffectiveTimestamp>] |
| Surveillance Notification |                                                                                                         |
| Text                      |                                                                                                         |
| Source                    | None                                                                                                    |
| Frequency                 |                                                                                                         |
| Trap                      |                                                                                                         |
| Trap <b>ID</b>            | 146                                                                                                     |
| Trap <b>MIB</b> Name      | npaNxxPortedAtTS                                                                                        |

### 8066

#### Explanation

An audit of the network element identified by <CLLI> has begun.

#### Recovery

No action required; for information only.

**Event Details****Table B-133 Event 8066 Details**

| GUI Notification          |                                             |
|---------------------------|---------------------------------------------|
| Severity                  | Cleared                                     |
| Text                      | Audit <b>LNP DB</b> Synchronization Started |
| Surveillance Notification |                                             |
| Text                      | <b>NE &lt;CLLI&gt;</b> Audit started        |
| Source                    | Active server                               |
| Frequency                 | Once, as soon as condition occurs           |
| Trap                      |                                             |
| Trap ID                   | 147                                         |
| Trap MIB Name             | ebdaAuditActive                             |

**8067****Explanation**

An audit of the network element identified by <CLLI> has completed successfully.

**Recovery**

No action required; for information only.

**Event Details****Table B-134 Event 8067 Details**

| GUI Notification          |                                               |
|---------------------------|-----------------------------------------------|
| Severity                  | Cleared                                       |
| Text                      | Audit <b>LNP DB</b> Synchronization Completed |
| Surveillance Notification |                                               |
| Text                      | <b>NE &lt;CLLI&gt;</b> Audit completed        |
| Source                    | Active server                                 |
| Frequency                 | Once, as soon as condition occurs             |
| Trap                      |                                               |
| Trap ID                   | 148                                           |
| Trap MIB Name             | ebdaAuditSuccess                              |

**8068****Explanation**

An audit of the network element identified by <CLLI> has failed.

**Recovery**

Inspect the log file `/var/TKLC/lsmss/logs/<CLLI>/LsmssTrans.log.MMDD` for details as to the cause of the error. After clearing the cause of the error, start the audit again.

**Event Details**

**Table B-135 Event 8068 Details**

| GUI Notification          |                                            |
|---------------------------|--------------------------------------------|
| Severity                  | Critical                                   |
| Text                      | Audit <b>LNP DB</b> Synchronization Failed |
| Surveillance Notification |                                            |
| Text                      | <b>NE &lt;CLLI&gt;</b> Audit failed        |
| Source                    | Active server                              |
| Frequency                 | Once, as soon as condition occurs          |
| Trap                      |                                            |
| Trap ID                   | 149                                        |
| Trap MIB Name             | ebdaAuditFailure                           |

**8069****Explanation**

The user aborted an audit of the network element identified by <CLLI> before it had completed.

**Recovery**

No action required; for information only.

**Event Details****Table B-136 Event 8069 Details**

| GUI Notification          |                                             |
|---------------------------|---------------------------------------------|
| Severity                  | Cleared                                     |
| Text                      | Audit <b>LNP DB</b> Synchronization Aborted |
| Surveillance Notification |                                             |
| Text                      | <b>NE &lt;CLLI&gt;</b> Audit aborted        |
| Source                    | Active server                               |
| Frequency                 | Once, as soon as condition occurs           |
| Trap                      |                                             |
| Trap ID                   | 150                                         |
| Trap MIB Name             | ebdaAuditAbortedByUser                      |

**8070****Explanation**

A reconcile has started at the completion of an audit.

**Recovery**

No action required; for information only.

**Event Details**

**Table B-137 Event 8070 Details**

| GUI Notification          |                                                 |
|---------------------------|-------------------------------------------------|
| Severity                  | Cleared                                         |
| Text                      | Reconcile <b>LNP DB</b> Synchronization Started |
| Surveillance Notification |                                                 |
| Text                      | <b>NE &lt;CLLI&gt;</b> Reconcile started        |
| Source                    | Active server                                   |
| Frequency                 | Once, as soon as condition occurs               |
| Trap                      |                                                 |
| Trap ID                   | 151                                             |
| Trap MIB Name             | ebdaReconcileActive                             |

**8071****Explanation**

A reconcile, which was performed at the end of an audit, has completed.

**Recovery**

No action required; for information only.

**Event Details****Table B-138 Event 8071 Details**

| GUI Notification          |                                                  |
|---------------------------|--------------------------------------------------|
| Severity                  | Cleared                                          |
| Text                      | Reconcile <b>LNP DB</b> Synchronization Complete |
| Surveillance Notification |                                                  |
| Text                      | <b>NE &lt;CLLI&gt;</b> Reconcile completed       |
| Source                    | Active server                                    |
| Frequency                 | Once, as soon as condition occurs                |
| Trap                      |                                                  |
| Trap ID                   | 152                                              |
| Trap MIB Name             | ebdaReconcileSuccess                             |

**8072****Explanation**

A reconcile, which was performed at the end of an audit, has failed before it completed.

**Recovery**

Inspect the log file `/var/TKLC/lsmc/logs/<CLLI>/LsmcAudit.log.MMDD` for details as to the cause of the error. After clearing the cause of the error, start the reconcile again.

**Event Details**



**Table B-139 Event 8072 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | Critical                                       |
| Text                      | Reconcile <b>LNP DB</b> Synchronization Failed |
| Surveillance Notification |                                                |
| Text                      | <b>NE &lt;CLLI&gt;</b> Reconcile failed        |
| Source                    | Active server                                  |
| Frequency                 | Once, as soon as condition occurs              |
| Trap                      |                                                |
| Trap ID                   | 153                                            |
| Trap MIB Name             | ebdaReconcileFailure                           |

**8073****Explanation**

The user has stopped a reconcile before it completed.

**Recovery**

No action required; for information only.

**Event Details****Table B-140 Event 8073 Details**

| GUI Notification          |                                                 |
|---------------------------|-------------------------------------------------|
| Severity                  | Cleared                                         |
| Text                      | Reconcile <b>LNP DB</b> Synchronization Aborted |
| Surveillance Notification |                                                 |
| Text                      | <b>NE &lt;CLLI&gt;</b> Reconcile aborted        |
| Source                    | Active server                                   |
| Frequency                 | Once, as soon as condition occurs               |
| Trap                      |                                                 |
| Trap ID                   | 154                                             |
| Trap MIB Name             | ebdaReconcileAbortedByUser                      |

**8078****Explanation**

A bulk download is currently running.

**Recovery**

No action required; for information only.

**Event Details**

**Table B-141 Event 8078 Details**

| GUI Notification          |                                                 |
|---------------------------|-------------------------------------------------|
| Severity                  | Cleared                                         |
| Text                      | Bulk Load <b>LNP DB</b> Synchronization Started |
| Surveillance Notification |                                                 |
| Text                      | <b>NE &lt;CLLI&gt;</b> Bulk load started        |
| Source                    | Active server                                   |
| Frequency                 | Once, as soon as condition occurs               |
| Trap                      |                                                 |
| Trap ID                   | 159                                             |
| Trap MIB Name             | ebdaBulkLoadActive                              |

**8079****Explanation**

A bulk download has completed successfully.

**Recovery**

No action required; for information only.

**Event Details****Table B-142 Event 8079 Details**

| GUI Notification          |                                                  |
|---------------------------|--------------------------------------------------|
| Severity                  | Cleared                                          |
| Text                      | Bulk Load <b>LNP DB</b> Synchronization Complete |
| Surveillance Notification |                                                  |
| Text                      | <b>NE &lt;CLLI&gt;</b> Bulk load completed       |
| Source                    | Active server                                    |
| Frequency                 | Once, as soon as condition occurs                |
| Trap                      |                                                  |
| Trap ID                   | 160                                              |
| Trap MIB Name             | ebdaBulkLoadSuccess                              |

**8080****Explanation**

A bulk download has failed before it completed.

**Recovery**

Inspect the log file `/var/TKLC/lrms/logs/<CLLI>/LrmsBulkLoad.log.MMDD` for details as to the cause of the error. After clearing the cause of the error, start the bulk download again.

**Event Details**

**Table B-143 Event 8080 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | Critical                                       |
| Text                      | Bulk Load <b>LNP DB</b> Synchronization Failed |
| Surveillance Notification |                                                |
| Text                      | <b>NE &lt;CLLI&gt;</b> Bulk load failed        |
| Source                    | Active server                                  |
| Frequency                 | Once, as soon as condition occurs              |
| Trap                      |                                                |
| Trap ID                   | 161                                            |
| Trap MIB Name             | ebdaBulkLoadFailure                            |

**8081****Explanation**

The user has stopped a bulk download before it completed.

**Recovery**

No action required; for information only.

**Event Details****Table B-144 Event 8081 Details**

| GUI Notification          |                                                 |
|---------------------------|-------------------------------------------------|
| Severity                  | Cleared                                         |
| Text                      | Bulk Load <b>LNP DB</b> Synchronization Aborted |
| Surveillance Notification |                                                 |
| Text                      | <b>NE &lt;CLLI&gt;</b> Bulk load aborted        |
| Source                    | Active server                                   |
| Frequency                 | Once, as soon as condition occurs               |
| Trap                      |                                                 |
| Trap ID                   | 162                                             |
| Trap MIB Name             | ebdaBulkLoadAbortedByUser                       |

**8082****Explanation**

A user-initiated resynchronization is currently running.

**Recovery**

No action required; for information only.

**Event Details**

**Table B-145 Event 8082 Details**

| GUI Notification          |                                               |
|---------------------------|-----------------------------------------------|
| Severity                  | Cleared                                       |
| Text                      | Re-sync <b>LNP DB</b> Synchronization Started |
| Surveillance Notification |                                               |
| Text                      | <b>NE &lt;CLLI&gt;</b> Re-sync started        |
| Source                    | Active server                                 |
| Frequency                 | Once, as soon as condition occurs             |
| Trap                      |                                               |
| Trap ID                   | 163                                           |
| Trap MIB Name             | ebdaResyncActive                              |

**8083****Explanation**

A user-initiated resynchronization has completed successfully.

**Recovery**

No action required; for information only.

**Event Details****Table B-146 Event 8083 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | Cleared                                        |
| Text                      | Re-sync <b>LNP DB</b> Synchronization Complete |
| Surveillance Notification |                                                |
| Text                      | <b>NE &lt;CLLI&gt;</b> Re-sync completed       |
| Source                    | Active server                                  |
| Frequency                 | Once, as soon as condition occurs              |
| Trap                      |                                                |
| Trap ID                   | 164                                            |
| Trap MIB Name             | ebdaResyncSuccess                              |

**8084****Explanation**

A user-initiated resynchronization has failed before it completed.

**Recovery**

Inspect the contents of the file `/var/TKLC/lsmc/logs/<CLLI>/LsmcResync.log.MMDD` to determine the cause of the error. After clearing the cause of the error, start the user-initiated resynchronization again.

**Event Details**

**Table B-147 Event 8084 Details**

| GUI Notification          |                                              |
|---------------------------|----------------------------------------------|
| Severity                  | Critical                                     |
| Text                      | Re-sync <b>LNP DB</b> Synchronization Failed |
| Surveillance Notification |                                              |
| Text                      | <b>NE &lt;CLLI&gt;</b> Re-sync failed        |
| Source                    | Active server                                |
| Frequency                 | Once, as soon as condition occurs            |
| Trap                      |                                              |
| Trap ID                   | 165                                          |
| Trap MIB Name             | ebdaResyncFailure                            |

**8085****Explanation**

The user has stopped a user-initiated resynchronization before it completed.

**Recovery**

No action required; for information only.

**Event Details****Table B-148 Event 8085 Details**

| GUI Notification          |                                               |
|---------------------------|-----------------------------------------------|
| Severity                  | Cleared                                       |
| Text                      | Re-sync <b>LNP DB</b> Synchronization Aborted |
| Surveillance Notification |                                               |
| Text                      | <b>NE &lt;CLLI&gt;</b> Re-sync aborted        |
| Source                    | Active server                                 |
| Frequency                 | Once, as soon as condition occurs             |
| Trap                      |                                               |
| Trap ID                   | 166                                           |
| Trap MIB Name             | ebdaResyncAbortedByUser                       |

**8086****Explanation**

This notification indicates that the Sprint IddAgent has failed to communicate with the Sprint Legacy System.

**Recovery**

No action required; for information only.

**Event Details**

**Table B-149 Event 8086 Details**

| GUI Notification          |                                   |
|---------------------------|-----------------------------------|
| Severity                  | None                              |
| Text                      |                                   |
| Surveillance Notification |                                   |
| Text                      | FAILED:IddAgent legacy            |
| Source                    | Both servers                      |
| Frequency                 | Once, as soon as condition occurs |
|                           | Trap                              |
| Trap ID                   | 167                               |
| Trap MIB Name             | sprintIddAgentCommFailureLegSys   |

**8087****Explanation**

This notification indicates that the Sprint IddAgent has failed to communicate with the Sprint SCPMS System.

**Recovery**

Contact My Oracle Support for assistance.

**Event Details****Table B-150 Event 8087 Details**

| GUI Notification          |                                   |
|---------------------------|-----------------------------------|
| Severity                  | None                              |
| Text                      |                                   |
| Surveillance Notification |                                   |
| Text                      | FAILED:IddAgent scpms             |
| Source                    | Both servers                      |
| Frequency                 | Once, as soon as condition occurs |
|                           | Trap                              |
| Trap ID                   | 168                               |
| Trap MIB Name             | sprintIddAgentCommFailureScpmsSys |

**8088****Explanation**

A scheduled file transfer has failed.

**Recovery**

Inspect the error log file `/var/TKLC/lms/logs/aft/aft.log.MMDD` for details as to the cause of the error.

**Event Details**

**Table B-151 Event 8088 Details**

| GUI Notification          |                                                       |
|---------------------------|-------------------------------------------------------|
| Severity                  | Major                                                 |
| Text                      | Automatic File Transfer Failure - See Log for Details |
| Surveillance Notification |                                                       |
| Text                      | Notify:Sys Admin- Auto xfer Failure                   |
| Source                    | Active server                                         |
| Frequency                 | Once, as soon as condition occurs                     |
| Trap                      |                                                       |
| Trap ID                   | 171                                                   |
| Trap MIB Name             | automaticFileTransferFeatureFailure                   |

**8089****Explanation**

An **NPA-NXX** split activation completed successfully.

**Recovery**

No action required; for information only.

**Event Details****Table B-152 Event 8089 Details**

| GUI Notification          |                                                                                                             |
|---------------------------|-------------------------------------------------------------------------------------------------------------|
| Severity                  | Cleared                                                                                                     |
| Text                      | Activate Split Successful OldNPA=<old_ <b>NPA</b> ><br>NewNPA=<new_ <b>NPA</b> > <b>NXX</b> =< <b>NXX</b> > |
| Surveillance Notification |                                                                                                             |
| Text                      |                                                                                                             |
| Source                    | None                                                                                                        |
| Frequency                 |                                                                                                             |
| Trap                      |                                                                                                             |
| Trap ID                   | 10                                                                                                          |
| Trap MIB Name             | npaSplitActOk                                                                                               |

**8090****Explanation**

An **NPA-NXX** split activation failed.

**Recovery**

Perform and audit and reconcile of **NPA** Split information at the network element.

**Event Details**

**Table B-153 Event 8090 Details**

| GUI Notification          |                                                                      |
|---------------------------|----------------------------------------------------------------------|
| Severity                  | Critical                                                             |
| Text                      | Activate Split Failed OldNPA=<old_NPA><br>NewNPA=<new_NPA> NXX=<NXX> |
| Surveillance Notification |                                                                      |
| Text                      |                                                                      |
| Source                    | None                                                                 |
| Frequency                 |                                                                      |
|                           | Trap                                                                 |
| Trap ID                   | 172                                                                  |
| Trap MIB Name             | npaSplitActFailed                                                    |

**8091****Explanation**

At least one active **NPA-NXX** split is past its end date and needs to be deleted.

**Recovery**

Do the following:

1. View all split objects (for information, refer to the *Database Administrator's Guide*) to determine which objects have end dates that have already passed.
2. Delete the objects whose end dates have passed (for information, refer to the *Database Administrator's Guide*).

**Event Details****Table B-154 Event 8091 Details**

| GUI Notification          |                                        |
|---------------------------|----------------------------------------|
| Severity                  | Major                                  |
| Text                      | Active Splits Are Past Their End Dates |
| Surveillance Notification |                                        |
| Text                      |                                        |
| Source                    | None                                   |
| Frequency                 |                                        |
|                           | Trap                                   |
| Trap ID                   | 173                                    |
| Trap MIB Name             | activeSplitsPastEndDates               |

**8092****Explanation**

This notification indicates the LDD SCPMS agent is switching from primary to backup SCPMS system.



**Recovery**

No action required; this notification is for information only.

**Event Details****Table B-155 Event 8092 Details**

| GUI Notification          |                                                               |
|---------------------------|---------------------------------------------------------------|
| Severity                  | Critical                                                      |
| Text                      | LDD SCPMS Agent Switching from Primary to Backup SCPMS System |
| Surveillance Notification |                                                               |
| Text                      |                                                               |
| Source                    | None                                                          |
| Frequency                 |                                                               |
| Trap                      |                                                               |
| Trap ID                   | 174                                                           |
| Trap MIB Name             | IddScpmsAgentSwitchToBackupScpms                              |

**8093****Explanation**

This notification indicates the LDD SCPMS agent is switching from backup to primary SCPMS system.

**Recovery**

No action required; this notification is for information only.

**Event Details****Table B-156 Event 8093 Details**

| GUI Notification          |                                                               |
|---------------------------|---------------------------------------------------------------|
| Severity                  | Critical                                                      |
| Text                      | LDD SCPMS Agent Switching from Backup to Primary SCPMS System |
| Surveillance Notification |                                                               |
| Text                      |                                                               |
| Source                    | None                                                          |
| Frequency                 |                                                               |
| Trap                      |                                                               |
| Trap ID                   | 175                                                           |
| Trap MIB Name             | IddScpmsAgentSwitchFromBackupToPrim                           |

**8094****Explanation**

This notification indicates the LDD SCPMS current system is primary SCPMS.

**Recovery**

No action required; this notification is for information only.

**Event Details****Table B-157 Event 8094 Details**

| GUI Notification          |                                           |
|---------------------------|-------------------------------------------|
| Severity                  | Cleared                                   |
| Text                      | LDD SCPMS Current System is Primary SCPMS |
| Surveillance Notification |                                           |
| Text                      |                                           |
| Source                    | None                                      |
| Frequency                 |                                           |
| Trap                      |                                           |
| Trap ID                   | 176                                       |
| Trap MIB Name             | IddScpmsPrimary                           |

**8095****Explanation**

This notification indicates the LDD SCPMS current system is backup SCPMS.

**Recovery**

No action required; this notification is for information only.

**Event Details****Table B-158 Event 8095 Details**

| GUI Notification          |                                          |
|---------------------------|------------------------------------------|
| Severity                  | Cleared                                  |
| Text                      | LDD SCPMS Current System is Backup SCPMS |
| Surveillance Notification |                                          |
| Text                      |                                          |
| Source                    | None                                     |
| Frequency                 |                                          |
| Trap                      |                                          |
| Trap ID                   | 177                                      |
| Trap MIB Name             | IddScpmsBackup                           |

**8096****Explanation**

The **EMS/NE** has rejected the **NPANXX** Split operation indicated by <operation>, and the **NPANXX** value in the transaction could not be determined.

**Recovery**

Look in the transaction log file, `/var/TKLC/lsmss/logs/<CLLI>/LsmssTrans.log.MMDD`, and locate the **NE**'s response to the **NPANXX** Split command to determine why the command failed. Delete and re-enter the **NPANXX** Split data correctly, which will cause the **LSMS** to try to command again.

### Event Details

**Table B-159 Event 8096 Details**

| GUI Notification          |                                                |
|---------------------------|------------------------------------------------|
| Severity                  | Major                                          |
| Text                      | <CLLI>: <b>NPANXX</b> Split <operation> Failed |
| Surveillance Notification |                                                |
| Text                      |                                                |
| Source                    | None                                           |
| Frequency                 |                                                |
|                           | Trap                                           |
| Trap ID                   | 178                                            |
| Trap MIB Name             | EmsNeRejNpaNxxSplitNotDetermined               |

### 8097

### Explanation

The **EMS/NE** has rejected the **NPANXX** Split operation indicated by <operation> for the indicated **NPANXX** value.

### Recovery

Look in the transaction log file, `/var/TKLC/lsmss/logs/<CLLI>/LsmssTrans.log.MMDD`, and locate the **NE**'s response to the **NPANXX** Split command to determine why the command failed. Delete and re-enter the **NPANXX** Split data correctly, which will cause the **LSMS** to try to command again.

### Event Details

**Table B-160 Event 8097 Details**

| GUI Notification          |                                                                               |
|---------------------------|-------------------------------------------------------------------------------|
| Severity                  | Major                                                                         |
| Text                      | <CLLI>: <b>NPANXX</b> Split <operation> Failed for New <b>NPANXX</b> <NPANXX> |
| Surveillance Notification |                                                                               |
| Text                      |                                                                               |
| Source                    | None                                                                          |
| Frequency                 |                                                                               |
|                           | Trap                                                                          |
| Trap ID                   | 179                                                                           |
| Trap MIB Name             | EmsNeRejectedNpaNxxSplit                                                      |

**8098****Explanation**

The **LSMS** is not able to confirm the physical connectivity with the directly connected query server identified by <hostname>. The problem may be one of the following:

- Physical connectivity issues between the **LSMS** and directly connected Query Server.
- The query server host name is not associated with the appropriate **Internet Protocol (IP)** address in `/etc/hosts` file.
- The **Internet Protocol (IP)** address specified for the special replication user for the for the query server is incorrect.
- The proper **TCP/IP** ports are not open in the firewall(s) between the **LSMS** and the query servers.

**Recovery**

- Check the physical connectivity of the **LSMS** to the query server.
- Check that the query server hosts name is associated with corresponding **Internet Protocol (IP)** addresses in `/etc/hosts` file.
- Verify that the **IP** address for the query server is correct. Display the **IP** address of all configured query servers by using the `$LSMS_TOOLS_DIR/lmsdb -c queryservers` command.
- Verify that the firewall **TCP/IP** port configuration is set correctly for both the **LSMS** and query servers directly connected to the **LSMS** (refer to Appendix A, “Configuring the Query Server,” of the *Configuration Guide* for information about port configuration for firewall protocol filtering).

**Event Details****Table B-161 Event 8098 Details**

| GUI Notification          |                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------|
| Severity                  | Major                                                                                 |
| Text                      | Query Server <hostname> Physical Connection Lost                                      |
| Surveillance Notification |                                                                                       |
| Text                      | Query Server=<hostname> Physical Conn Lost                                            |
| Source                    | Active Server                                                                         |
| Frequency                 | As soon as condition occurs, and at five-minute intervals as long as condition exists |
| SNMP Trap                 |                                                                                       |
| Trap ID                   | 180                                                                                   |
| Trap MIB Name             | physicalConnectivityWithQueryServerLost                                               |

**8099****Explanation**

The query server identified by <hostname> does not have a replication connection established with the **LSMS**. The problem may be one of the following:

- Query server cannot establish a connection with the master.
- Query server not properly configured to connect to the master.
- A query that succeeded on the master failed on the query server.
- The binary log(s) that are needed by the query server to resynchronize itself to its master no longer exist.
- Data on the query server does not agree with what is on the master when the binary log was started.
- Replication was stopped at the query server by a user.

### Recovery

1. At the query server, perform the following substeps:

- a. Start the MySQL command line utility on the slave server:

```
cd /opt/mysql/mysql/bin
mysql -u root -p
```

Enter password:

```
<Query Server/s MySql root user password>
```

- b. Determine whether the query server is running by entering the following command and looking at the `Slave_IO_Running` and `Slave_SQL_Running` column values.

```
mysql> SHOW SLAVE STATUS \G;
```

- If the `Slave_IO_Running` and `Slave_SQL_Running` column values show that the slave is not running, verify the query server's `/usr/mysql1/my.cnf` option file (refer to “MySQL Replication Configuration for Query Servers,” in Appendix A, “Configuring the Query Server,” of the *Configuration Guide*) and check the error log (`/usr/mysql1/<hostname>.err`) for messages.
- If the `Slave_IO_Running` and `Slave_SQL_Running` column values show that the slave (query server) is running, enter the following command to verify whether the slave established a connection with the master (**LSMS** or another query server acting as a master/slave).

```
mysql> SHOW PROCESSLIST;
```

Find the thread with the system user value in the `User` column and none in the `Host` column, and check the `State` column. If the `State` column says “connecting to master,” verify that the master hostname is correct, that the **DNS** is properly set up, whether the master is actually running, and whether it is reachable from the slave (refer to Appendix A, “Configuring the Query Server,” of the *Configuration Guide* for information about port configuration for firewall protocol filtering if the master and slave are connecting through a firewall).

- If the slave was running, but then stopped, enter the following command:

```
mysql> SHOW SLAVE STATUS;
```

Look at the output. This error can happen when some query that succeeded on the master fails on the slave, but this situation should never happen while the

replication is active if you have taken a proper snapshot of the master and never modify the data on the slave outside of the slave thread.

2. However, if this is not the case, or if the failed items are not needed and there are only a few of them, try the following:
  - a. First see if there is some stray record in the way on the query server. Understand how it got there, then delete it from the query server database and run `start slave`.
  - b. If the above does not work or does not apply, try to understand if it would be safe to make the update manually (if needed) and then ignore the next query from the **LSMS**.
  - c. If you have decided you can skip the next query, enter one of the following command sequences:
    - To skip a query that uses **AUTO\_INCREMENT** or **LAST\_INSERT\_ID()**, enter:
 

```
mysql> SET GLOBAL SQL_SLAVE_SKIP_COUNTER=2;
mysql> start slave;
```

Queries that use **AUTO\_INCREMENT** or **LAST\_INSERT\_ID()** take two events in the binary log of the master.
    - Otherwise, enter:
 

```
mysql> SET GLOBAL SQL_SLAVE_SKIP_COUNTER=1;
mysql> start slave;
```
3. If you are sure the query server database started out perfectly in sync with the **LSMS** database, and no one has updated the tables involved outside of the slave thread, contact My Oracle Support so you will not have to do the above steps again.
4. If all else fails, read the error log, `/usr/mysql/<hostname>.err`. If the log is big, run the following command on the slave:
 

```
grep -i slave /usr/mysql1/<hostname>.err
```

(There is no generic pattern to search for on the master, as the only errors it logs are general system errors. If it can, the master will send the error to the slave when things go wrong.)

  - If the error log on the slave conveys that it could not find a binary log file, this indicates that the binary log files on the master have been removed (purged). Binary logs are periodically purged from the master to prevent them from growing unbounded and consuming large amounts of disk resources. However, if a query server was not replicating and one of the binary log files it wants to read is purged, it will be unable to replicate once it comes up. If this occurs, the query server is required to be reset with another snapshot of data from the master or another query server (see [“Reload a Query Server Database from the LSMS”](#) and [“Reload a Query Server Database from Another Query Server”](#)).
  - When you have determined that there is no user error involved, and replication still either does not work at all or is unstable, please contact My Oracle Support.

## Event Details

**Table B-162 Event 8099 Details**

| GUI Notification |                                                     |
|------------------|-----------------------------------------------------|
| Severity         | Major                                               |
| Text             | Query Server <hostname> Replication Connection Lost |

**Table B-162 (Cont.) Event 8099 Details**

| Surveillance Notification |                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------|
| Text                      | Query Server=<hostname> Replication Conn Lost                                         |
| Source                    | Active Server                                                                         |
| Frequency                 | As soon as condition occurs, and at five-minute intervals as long as condition exists |
| SNMP Trap                 |                                                                                       |
| Trap ID                   | 181                                                                                   |
| Trap MIB Name             | queryServerConnectionWithLsmsLost                                                     |

**8100****Explanation**

The SV/NPB storage database has exceeded the configured percent usage threshold.

**Recovery**

Contact My Oracle Support.

**Event Details****Table B-163 Event 8100 Details**

| GUI Notification          |                                        |
|---------------------------|----------------------------------------|
| Severity                  | Event                                  |
| Text                      | SV/NPB Storage Exceeds <%> percent     |
| Surveillance Notification |                                        |
| Text                      | Notify:Sys Admin - SV/NPB threshold %  |
| Source                    | Both servers                           |
| Frequency                 | Every 5 minutes after condition occurs |
| Trap                      |                                        |
| Trap ID                   | 194                                    |
| Trap MIB Name             | svNpbPercentUsage                      |

**8101****Explanation**

This event indicates that the SV/NPB storage database usage is below the configured percent usage threshold.

**Recovery**

No action is required

**Event Details****Table B-164 Event 8101 Details**

| GUI Notification |
|------------------|
|------------------|

**Table B-164 (Cont.) Event 8101 Details**

|               |                                        |
|---------------|----------------------------------------|
| Severity      | Cleared                                |
| Text          | SV/NPB storage falls below <%> percent |
|               | Surveillance Notification              |
| Text          | Notify: Sys Admin - SV/NPB cleared     |
| Source        | Both servers                           |
| Frequency     | As soon as condition clears            |
|               | Trap                                   |
| Trap ID       | 207                                    |
| Trap MIB Name | svNpbBelowLimit                        |

**8102****Explanation**

The event number present in the untilClear filter list is cleared. The event number is removed from the untilClear filter list.

**Recovery**

No action is required.

**Event Details****Table B-165 Event 8102 Details**

|               |                                                                            |
|---------------|----------------------------------------------------------------------------|
|               | GUI Notification                                                           |
| Severity      | Event                                                                      |
| Text          | <Event number> in the untilClear filter list, event clear received at <%s> |
|               | Surveillance Notification                                                  |
| Text          |                                                                            |
| Source        | None                                                                       |
| Frequency     |                                                                            |
|               | Trap                                                                       |
| Trap ID       |                                                                            |
| Trap MIB Name | None                                                                       |

**8103****Explanation**

The alarm filter counter has reached its limit; the counter will start again from one.

**Recovery**

No action is required.

**Event Details**



**Table B-166 Event 8103 Details**

| GUI Notification          |                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------|
| Severity                  | Event                                                                               |
| Text                      | Counter associated with event <event number> exceeds limit <%s>. Resetting counter. |
| Surveillance Notification |                                                                                     |
| Text                      |                                                                                     |
| Source                    | None                                                                                |
| Frequency                 |                                                                                     |
|                           | Trap                                                                                |
| Trap ID                   |                                                                                     |
| Trap MIB Name             | None                                                                                |

**8104****Explanation**

The event number present in the untilTimeout filter list is cleared. The event number is removed from the untilTimeout filter list.

**Recovery**

No action is required.

**Event Details****Table B-167 Event 8104 Details**

| GUI Notification          |                                                                       |
|---------------------------|-----------------------------------------------------------------------|
| Severity                  | Event                                                                 |
| Text                      | <Event number> in the untilTimeout filter list, event timeout at <%s> |
| Surveillance Notification |                                                                       |
| Text                      |                                                                       |
| Source                    | None                                                                  |
| Frequency                 |                                                                       |
|                           | Trap                                                                  |
| Trap ID                   |                                                                       |
| Trap MIB Name             | None                                                                  |

**8105****Explanation**

The log capture started by the user has failed.

**Recovery**

Contact My Oracle Support.

**Event Details**

**Table B-168 Event 8105 Details**

| GUI Notification          |                     |
|---------------------------|---------------------|
| Severity                  | Minor               |
| Text                      | Logs Capture Failed |
| Surveillance Notification |                     |
| Text                      |                     |
| Source                    | None                |
| Frequency                 |                     |
|                           | Trap                |
| Trap ID                   |                     |
| Trap MIB Name             | None                |

**8106****Explanation**

The MySQL Port has been updated. The LSMS application must be restarted.

**Recovery**

The application must be restarted. Restart the LSMS application first on the active server and then on the standby server. For more information, refer to the *Configuration Guide*.

**Event Details****Table B-169 Event 8106 Details**

| GUI Notification          |                                                                          |
|---------------------------|--------------------------------------------------------------------------|
| Severity                  | Event                                                                    |
| Text                      | MySQL Port changed from <%s> to <%s>. LSMS application restart required. |
| Surveillance Notification |                                                                          |
| Text                      | Notify: Sys Admin - LSMS restart required                                |
| Source                    | Active server                                                            |
| Frequency                 | Once, as soon as condition occurs                                        |
|                           | Trap                                                                     |
| Trap ID                   | 208                                                                      |
| Trap MIB Name             | mysqlPortUpdated                                                         |

**8107****Explanation**

The MySQL Port has been updated. The Query Server configuration needs to be updated with the new MySQL port.

**Recovery**

Configure the Query Server with the updated MySQL port. For more information, refer to the *Configuration Guide*.

**Event Details****Table B-170 Event 8107 Details**

| GUI Notification          |                                                                                    |
|---------------------------|------------------------------------------------------------------------------------|
| Severity                  | Event                                                                              |
| Text                      | MySQL Port changed from <%s> to <%s>. Query Server configuration updated required. |
| Surveillance Notification |                                                                                    |
| Text                      | Notify: Sys Admin - QS updated required                                            |
| Source                    | Active server                                                                      |
| Frequency                 | Once, as soon as condition occurs                                                  |
| Trap                      |                                                                                    |
| Trap ID                   | 209                                                                                |
| Trap MIB Name             | queryServerResetConfiguration                                                      |

**8108****Explanation**

At least one of the connected Query Servers is out of sync, and the binary logs cannot be purged without user confirmation.

**Recovery**

When the Query Server is out of sync, automatic purging is not possible. To delete all but the last 10 binary logs, log on to the active LSMS server as `root` and enter the following command:

```
pruneBinaryLogs -force
```

**Event Details****Table B-171 Event 8108 Details**

| GUI Notification          |                                                                              |
|---------------------------|------------------------------------------------------------------------------|
| Severity                  | Minor                                                                        |
| Text                      | Automatic purging of binary logs cannot be done. User confirmation required. |
| Surveillance Notification |                                                                              |
| Text                      | Notify: Sys Admin - Purge need confirmation                                  |
| Source                    | Both servers                                                                 |
| Frequency                 | Every 45 minutes                                                             |
| Trap                      |                                                                              |
| Trap ID                   | 210                                                                          |
| Trap MIB Name             | purgeConfirmRequired                                                         |

**8109****Explanation**

Disk usage is reaching the capacity threshold, and an automatic purge of binary logs is imminent.

**Recovery**

No action is required.

**Event Details****Table B-172 Event 8109 Details**

| GUI Notification          |                                                                      |
|---------------------------|----------------------------------------------------------------------|
| Severity                  | Minor                                                                |
| Text                      | Disk usage reaching <%> percent. Purging of binary logs is imminent. |
| Surveillance Notification |                                                                      |
| Text                      | Notify: Sys Admin - Purging is imminent                              |
| Source                    | Both servers                                                         |
| Frequency                 | Every 45 minutes                                                     |
| Trap                      |                                                                      |
| Trap ID                   | 211                                                                  |
| Trap MIB Name             | purgeImminent                                                        |

**8110****Explanation**

Logs capture has been started by the user.

**Recovery**

No action is required.

**Event Details****Table B-173 Event 8110 Details**

| GUI Notification          |                      |
|---------------------------|----------------------|
| Severity                  | Cleared              |
| Text                      | Logs Capture Started |
| Surveillance Notification |                      |
| Text                      |                      |
| Source                    | None                 |
| Frequency                 |                      |
| Trap                      |                      |
| Trap ID                   |                      |
| Trap MIB Name             | None                 |

**8111****Explanation**

The logs capture started by the user completed successfully.

**Recovery**

No action is required.

**Event Details****Table B-174 Event 8111 Details**

| GUI Notification          |                            |
|---------------------------|----------------------------|
| Severity                  | Minor                      |
| Text                      | Logs Captured Successfully |
| Surveillance Notification |                            |
| Text                      |                            |
| Source                    | None                       |
| Frequency                 |                            |
| Trap                      |                            |
| Trap ID                   |                            |
| Trap MIB Name             | None                       |

**8112****Explanation**

Syscheck was not able to restart automatically by the cron job.

**Recovery**

Contact My Oracle Support.

**Event Details****Table B-175 Event 8112 Details**

| GUI Notification          |                                     |
|---------------------------|-------------------------------------|
| Severity                  | Event                               |
| Text                      | Failed to restart syscheck services |
| Surveillance Notification |                                     |
| Text                      |                                     |
| Source                    | None                                |
| Frequency                 |                                     |
| Trap                      |                                     |
| Trap ID                   |                                     |
| Trap MIB Name             | None                                |

**8116****Explanation**

The HTTP protocol is enabled but secure HTTP (HTTPS) is recommended.

**Recovery**

For information on configuring the protocols, see [Starting a Web-Based LSMS GUI Session](#).

**Event Details****Table B-176 Event 8116 Details**

| GUI Notification          |                                                     |
|---------------------------|-----------------------------------------------------|
| Severity                  | Event                                               |
| Text                      | HTTP is enabled and it is recommended to use HTTPS. |
| Surveillance Notification |                                                     |
| Text                      |                                                     |
| Source                    | None                                                |
| Frequency                 |                                                     |
|                           | Trap                                                |
| Trap ID                   |                                                     |
| Trap MIB Name             | None                                                |

**8117****Explanation**

HTTP is disabled and HTTPS is enabled.

**Recovery**

No recovery required; only HTTPS is enabled now.

**Event Details****Table B-177 Event 8117 Details**

| GUI Notification          |                            |
|---------------------------|----------------------------|
| Severity                  | Event                      |
| Text                      | Only HTTPS is enabled now. |
| Surveillance Notification |                            |
| Text                      |                            |
| Source                    | None                       |
| Frequency                 |                            |
|                           | Trap                       |
| Trap ID                   |                            |
| Trap MIB Name             | None                       |

**8118****Explanation**

Both HTTP and HTTPS are enabled, but using only HTTPS is recommended.

**Recovery**

For information on configuring the protocols, see [Starting a Web-Based LSMS GUI Session](#).

**Event Details**

**Table B-178 Event 8118 Details**

|                                  |                                                                     |
|----------------------------------|---------------------------------------------------------------------|
| <b>GUI Notification</b>          |                                                                     |
| Severity                         | Event                                                               |
| Text                             | Both HTTP and HTTPS are enabled and it is recommended to use HTTPS. |
| <b>Surveillance Notification</b> |                                                                     |
| Text                             |                                                                     |
| Source                           | None                                                                |
| Frequency                        |                                                                     |
| <b>Trap</b>                      |                                                                     |
| Trap ID                          |                                                                     |
| Trap MIB Name                    | None                                                                |

**Additional Trap Information**

| Trap Id | Trap MIB Name | Notification Description                                          | Trap variables def                                                                                                                                                                                            | Retry Interval | Severity          | Event Num | GUI Event Text    | Pair Event Num |
|---------|---------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|-----------|-------------------|----------------|
| 25      | dataReplInfo  | This notification indicates that database replication is delayed. | <b>eventNbr</b> = Oracle specific unique identifier for event notification. This eventNbr field can be used to reference Oracle documentation.<br><b>dbReplInfo</b> = Info message from database replication. | Every 5 mins   | event_notif_event | 4011      | DB Repl Info - %s | 0              |

| Trap Id | Trap MIB Name  | Notification Description                                                 | Trap variables def                                                                                                                                                                                              | Retry Interval | Severity             | Event Num | GUI Event Text        | Pair Event Num |
|---------|----------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------|-----------|-----------------------|----------------|
| 201     | snapInvalidErr | This notification indicates that the Invalid Snapshot has been detected. | <b>eventNbr</b><br>= Oracle specific unique identifier for event notification. This eventNbr field can be used to reference Oracle documentation.<br><b>snapName</b><br>= Name of the invalid snapshot.         | Every 30 mins  | event_notif_critical | 4034      | Invalid Snapshot - %s | 4035           |
| 203     | snapFullErr    | This notification indicates that the Snapshot is greater than 80% full.  | <b>eventNbr</b><br>= Oracle specific unique identifier for event notification. This eventNbr field can be used to reference Oracle documentation.<br><b>snapName</b><br>= Name of the invalid/hanging snapshot. | Every 30 mins  | event_notif_critical | 4036      | Full Snapshot - %s    | 4037           |

| Trap Id | Trap MIB Name   | Notification Description                                                              | Frequency                                                  | Source                                          | Clearing behavior |
|---------|-----------------|---------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------|-------------------|
| 212     | resyncStartTrap | The trap is sent by the LSMS to NMS when the LSMS is about to start resynchronization | Every time when starting a resynchronization with a NMS    | /vobs/lsmis/apps/snmp/lsmisSNMPResyncHandler.pl | None              |
| 213     | resyncStopTrap  | The trap is sent by the LSMS to NMS when resynchronization is complete                | Every time when a resynchronization with a NMS is complete | /vobs/lsmis/apps/snmp/lsmisSNMPResyncHandler.pl | None              |



| Trap Id | Trap MIB Name      | Notification Description                                                                                                                                                                                                                                                                                     | Frequency                                                                                                               | Source                                       | Clearing behavior |
|---------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------|
| 214     | resyncRejectTrap   | The trap is sent by the LSMS to NMS when a resynchronization request is rejected by LSMS                                                                                                                                                                                                                     | Every time when a resynchronization request is initialized while an existing resynchronization is still being processed | /vobs/lsm/apps/snmp/lsmSNMPResyncHandler.pl  | None              |
| 215     | resyncRequiredTrap | The trap is sent by the LSMS to NMS when the LSMS is rebooted or LSMS is started                                                                                                                                                                                                                             | Every time when LSMS is rebooted or restarted                                                                           | /vobs/lsm/apps/snmp/lsmSNMPResyncHandler.pl  | None              |
| 216     | heartBeatTrap      | The trap is sent by the LSMS to NMS periodically to indicate that the LSMS is up                                                                                                                                                                                                                             | Per the configured value in second (0, 5-7200), where 0 indicates the heartbeat trap is disabled.                       | /vobs/lsm/apps/snmp/lsmSnmHeartbeatSender.pl | None              |
| 217     | lsmAlarmTrapV3     | The trap will indicate that the following information is for a particular event                                                                                                                                                                                                                              | Every v3 trap message sent to nms will carry this OID                                                                   | /vobs/lsm/apps/snmp/lsmSNMPResyncHandler.pl  | None              |
| 218     | resyncErrCode      | errorCode = 0, Resynchronization completed successfully.<br>errorCode = 1, Resynchronization aborted by NMS.<br>errorCode = 2, Resynchronization already in progress for the NMS.<br>errorCode = 3, Resynchronization Aborted, Database error occurred.<br>errorCode = 4, Resynchronization not in progress. | Every time when either resyncStopTrap or resyncRejectTrap sent to NMS                                                   | /vobs/lsm/apps/snmp/lsmSNMPResyncHandler.pl  | None              |

## B.7 Platform Alarms

This section describes the following:

- [“How Platform Alarms Are Reported”](#)
- [“How to Decode Platform Alarms”](#)
- [Platform Alarms](#)

## How Platform Alarms Are Reported

Each server runs `syscheck` periodically and reports any problems found through platform alarms. The severity of platform alarms is one of the following:

- Critical, reported through event 4300
- Major, reported through event 4200
- Minor, reported through event 4100

When one or more problems in a given category has been found, the server reports one corresponding event notification to its Surveillance log and its serial port 3. If the server is not the active server, it also sends the event notification to the active server. The active server reports its own platform events to its own Surveillance log and to its Serial Port 3, and also sends an **SNMP** trap and displays a **GUI** notification for either its own platform events or for the non-active server's platform events.

Each of the events 4100, 4200, and 4300 contain a 16-character hexadecimal bitmasked string that indicates all of the platform events in that category that currently exist. To decode which platform events exist, use the procedure described in ["How to Decode Platform Alarms"](#).

Each time the combination of platform events in a given category changes, a new event is reported. Following is an example of how platform events are reported:

1. At first, only one major platform event is reported on the standby server. A 4200 event with the alarm number of the event is reported.
2. One minute later, another platform event exists on the standby server (and the first one still exists). Another 4200 event is reported, with a bitmasked string that indicates both of the platform events that exist.
3. One minute later, another platform event exists on the standby server (and the previous ones still exist). Another 4200 event is reported, with a bitmasked string that indicates all of the platform events that exist.
4. One minute later, the first platform event is cleared. Another 4200 event is reported, with a bitmasked string that indicates the two platform events that still exist.

## B.7.1 How to Decode Platform Alarms

Use the following procedure to determine all the platform alarms that exist in a given category:

1. Look in [Platform Alarms](#) to see if the alarm number is shown there.
  - If the alarm number matches one of the alarms shown in this table, only one alarm (the one that appears in the table) is being reported and you have completed this procedure.
  - If the alarm number does not match one of the alarms shown in this table, perform the remaining steps of this procedure.
2. Log in as any user to either server.
3. Enter the following command to decode the reported hexadecimal alarm string:

```
$ /usr/TKLC/plat/bin/almdecode <alarm_number>
```

The output displays the information about the alarm category and displays the text string for each of the alarms that is represented by the string. For example, if you enter:

```
$ /usr/TKLC/plat/bin/almdecode 30000000000000180
```

the following text displays:

The string alarm value comes from the Major Platform alarm category.

The following alarms are encoded within the hex string:

Server Swap Space Shortage FailureServer Provisioning Network Error

## B.7.2 Platform Alarms

Platform errors are grouped by category and severity. The categories are listed from most to least severe:

[Table B-179](#) shows the alarm numbers and alarm text for all alarms generated by the MPS platform. The order within a category is not significant. Some of the alarms described are not available with specific configurations.

**Table B-179 Platform Alarms**

| Alarm Codes and Error Descriptor                                     |
|----------------------------------------------------------------------|
| Major Platform Alarms                                                |
| 3000000000000001 – Server fan failure                                |
| 3000000000000002 - Server Internal Disk Error                        |
| 3000000000000008 - Server Platform Error                             |
| 3000000000000010 - Server File System Error                          |
| 3000000000000020 - Server Platform Process Error                     |
| 3000000000000080 - Server Swap Space Shortage Failure                |
| 3000000000000100 - Server provisioning network error                 |
| 3000000000000100 - Server Disk Space Shortage Error                  |
| 3000000000000200 - Server Default Route Network Error                |
| 3000000000000400 - Server Temperature Error                          |
| 3000000000000800 - Server Mainboard Voltage Error                    |
| 3000000000001000 - Server Power Feed Error                           |
| 3000000000002000 - Server Disk Health Test Error                     |
| 3000000000004000 - Server Disk Unavailable Error                     |
| 3000000000008000 - Device Error                                      |
| 3000000000010000 - Device Interface Error                            |
| 3000000008000000 - Server HA Keepalive Error                         |
| 3000000010000000 - DRBD block device can not be mounted              |
| 3000000020000000 - DRBD block device is not being replicated to peer |
| 3000000040000000 - DRBD peer needs intervention                      |
| 3000000400000000 - Multipath device access link problem              |
| 3000000800000000 – Switch Link Down Error                            |
| 3000001000000000 - Half-open Socket Limit                            |
| 3000002000000000 - Flash Program Failure                             |
| 3000004000000000 - Serial Mezzanine Unseated                         |
| Minor Platform Alarms                                                |
| 5000000000000001 - Server Disk Space Shortage Warning                |
| 5000000000000002 - Server Application Process Error                  |
| 5000000000000004 - Server Hardware Configuration Error               |

**Table B-179 (Cont.) Platform Alarms**

| Alarm Codes and Error Descriptor                             |
|--------------------------------------------------------------|
| 5000000000000008 - Server RAM Shortage Warning               |
| 5000000000000020 - Server Swap Space Shortage Warning        |
| 5000000000000040 - Server Default Router Not Defined         |
| 5000000000000080 – Server temperature warning                |
| 5000000000000100 - Server Core File Detected                 |
| 5000000000000200 - Server NTP Daemon Not Synchronized        |
| 5000000000000400 - Server CMOS Battery Voltage Low           |
| 5000000000000800 - Server Disk Self Test Warning             |
| 5000000000001000 - Device Warning                            |
| 5000000000002000 - Device Interface Warning                  |
| 5000000000004000 - Server Reboot Watchdog Initiated          |
| 5000000000008000 - Server HA Failover Inhibited              |
| 5000000000010000 - Server HA Active To Standby Transition    |
| 5000000000020000 - Server HA Standby To Active Transition    |
| 5000000000040000 - Platform Health Check Failure             |
| 5000000000080000 - NTP Offset Check Failure                  |
| 5000000000100000 - NTP Stratum Check Failure                 |
| 5000000000200000 - SAS Presence Sensor Missing               |
| 5000000000400000 - SAS Drive Missing                         |
| 5000000000800000 - DRBD failover busy                        |
| 5000000001000000 - HP disk resync                            |
| 5000000020000000 – Server Kernel Dump File Detected          |
| 5000000040000000 – TPD Upgrade Failed                        |
| 5000000080000000 - Half Open Socket Warning Limit            |
| <b>NOTE: The order within a category is not significant.</b> |

## B.7.3 Alarm Recovery Procedures

This section provides recovery procedures for the MPS, listed by alarm category and **Alarm Code** (alarm data string) within each category.

## B.7.4 Major Platform Alarms

Major platform alarms involve hardware components, memory, and network connections.

### B.7.4.1 3000000000000001 – Server fan failure

**Alarm Type:** TPD

**Description:** This alarm indicates that a fan in the EAGLE fan tray in the EAGLE shelf where the E5-APP-B is "jacked in" is either failing or has failed completely. In either case, there is a danger of component failure due to overheating.

**Severity:** Major

**OID:** TpdFanErrorNotify 1.3.6.1.4.1.323.5.3.18.3.1.2.1

**Alarm ID:** TKSPLATMA1300000000000001

## Recovery

### Note:

1. Run `syscheck` in Verbose mode to verify a fan failure using the following command:

```
[root@hostname1351690497 ~]# syscheck -v hardware fan
Running modules in class hardware...
 fan: Checking Status of Server Fans.
* fan: FAILURE:: MAJOR::30000000000000001 -- Server Fan Failure.
This test uses the leaky bucket algorithm.
* fan: FAILURE:: Fan RPM is too low, fana: 0, CHIP: FAN
One or more module in class "hardware" FAILED

LOG LOCATION: /var/TKLC/log/syscheck/fail_log
```

2. Refer to the procedure for determining the location of the fan assembly that contains the failed fan and replacing a fan assembly in the appropriate hardware manual. After you have opened the front lid to access the fan assemblies, determine whether any objects are interfering with the fan rotation. If some object is interfering with fan rotation, remove the object.
3. Contact My Oracle Support.

### B.7.4.2 30000000000000002 - Server Internal Disk Error

This alarm indicates that the server is experiencing issues replicating data to one or more of its mirrored disk drives. This could indicate that one of the server disks has failed or is approaching failure.

#### Recovery

1. Run `syscheck` in Verbose mode.
2. Contact My Oracle Support and provide the system health check output.

### B.7.4.3 30000000000000008 - Server Platform Error

This alarm indicates a major platform error such as a corrupt system configuration or missing files, or indicates that `syscheck` itself is corrupt.

#### Recovery

1. Run `syscheck` in Verbose mode.
2. Contact My Oracle Support and provide the system health check output.

### B.7.4.4 30000000000000010 - Server File System Error

This alarm indicates that `syscheck` was unsuccessful in writing to at least one of the server file systems.

#### Recovery

- Contact My Oracle Support for assistance.

#### B.7.4.5 30000000000000020 - Server Platform Process Error

This alarm indicates that either the minimum number of instances for a required process are not currently running or too many instances of a required process are running.

##### Recovery

- Contact My Oracle Support for recovery procedures.

#### B.7.4.6 30000000000000080 - Server Swap Space Shortage Failure

This alarm indicates that the server's swap space is in danger of being depleted. This is usually caused by a process that has allocated a very large amount of memory over time.



##### Note:

In order for this alarm to clear, the underlying failure condition must be consistently undetected for a number of polling intervals. Therefore, the alarm may continue to be reported for several minutes after corrective actions are completed.

##### Recovery

- Contact My Oracle Support for assistance.

#### B.7.4.7 30000000000000100 - Server provisioning network error

##### Alarm Type: TPD

**Description:** This alarm indicates that the connection between the server's eth01 ethernet interface and the customer network is not functioning properly. The eth01 interface is at the upper right port on the rear of the server on the EAGLE backplane.



##### Note:

The interface identified as eth01 on the hardware is identified as eth91 by the software (in syscheck output, for example).

##### Severity: Major

**OID:** TpdProvNetworkErrorNotify 1.3.6.1.4.1.323.5.3.18.3.1.2.9

**Alarm ID:** TKSPLATMA93000000000000100

##### Recovery

1. Check the physical network connectivity between the LSMS and the NAS.
2. Contact My Oracle Support.

#### B.7.4.8 30000000000001000 - Server Disk Space Shortage Error

This alarm indicates that one of the following conditions has occurred:

- A file system has exceeded a failure threshold, which means that more than 90% of the available disk storage has been used on the file system.
- More than 90% of the total number of available files have been allocated on the file system.
- A file system has a different number of blocks than it had when installed.

### Recovery

1. Run `syscheck`.
2. Examine the `syscheck` output to determine if the file system `/var/TKLC/lsmis/free` is low on space. If it is, continue to the next step; otherwise go to Step 4.
3. If possible, recover space on the free partition by deleting unnecessary files:
  - a. Log in to the server generating the alarm as the root user:  
Login: `root`  
Password: <Enter root password>
  - b. Change to the `/var/TKLC/lsmis/free` directory: `# cd /var/TKLC/lsmis/free`
  - c. Confirm that you are in the `/var/TKLC/lsmis/free` directory: `# pwd /var/TKLC/lsmis/free`
  - d. When the `pwd` command is executed, if `/var/TKLC/lsmis/free` is not output, go back to Sub-step b
  - e. List files to be deleted and delete them using the `rm` command
  - f. Re-run `syscheck`

If the alarm is cleared, the problem is solved. If the alarm is not cleared, go to the next Step.

4. If the file system mounted on `/var/TKLC/lsmis/logs` is the file system that `syscheck` is reporting to be low on space, execute the following steps:
  - a. Log in to the server generating the alarm as the root user:  
Login: `root`  
Password: <Enter root password>
  - b. Change to the `/var/TKLC/lsmis/logs` directory: `# cd /var/TKLC/lsmis/logs`
  - c. Confirm that you are in the `/var/TKLC/lsmis/logs` directory: `# pwd /var/TKLC/lsmis/logs`
  - d. When the `pwd` command is executed, if `/var/TKLC/lsmis/logs` is not output, go back to Sub-step b
  - e. Look for files with names matching: `logs_(hostname)_(date/timestamp).tar`, where (hostname) is replaced by the server's hostname, and (date/timestamp) is any date or timestamp. `# ls logs_'hostname'_*.tar`. Any files listed may be safely deleted, so for each file listed in the `ls` output, execute an `rm` command: `# rm <filename>` where <filename> is replaced by the name of the file to be deleted.
  - f. Re-run `syscheck`

If the alarm is cleared, the problem is solved. If the alarm is not cleared, go to the next Step.

5. Core files can occupy a large amount of disk space and may be the cause of this alarm. To collect and remove any core files from the server:

- a. Log in to the server generating the alarm as the root user:  
Login: root  
Password:<Enter root password>
- b. Change directory to /var/TKLC/core and list the core files. # cd /var/TKLC/core #  
ls -l

 **Note:**

The `ls` command shown above will list any core files found and then compresses and renames the file, adding a ".gz" extension. If any core files are found, transfer them off the system and save them for examination by Oracle Engineering. Once a copy of a compressed file has been saved, it is safe to delete it from the server.

- Re-run `syscheck`  
If the alarm is cleared, the problem is solved. If the alarm is not cleared, go to the next Step.
6. Execute the following Sub-steps if the file system reported by `syscheck` is /tmp, otherwise skip to Step 7:
    - a. Log in to the server generating the alarm as the root user:  
Login: root  
Password:<Enter root password>
    - b. Change to the /tmp directory: # cd /tmp
    - c. Confirm that you are in the /tmp directory: # pwd /tmp
    - d. When the `pwd` command is executed, if /tmp is not output, go back to Step 5.
    - e. Look for possible candidates for deletion: # ls \*.iso \*.bz2 \*.gz \*.tar \*.tgz \*.zip
    - f. If any deletable files exist, the output of the `ls` will show them. For each of the files listed, execute the `rm` command to delete the file: # rm <filename>
    - g. Run `syscheck`  
If the alarm is cleared, the problem is solved. If the alarm is not cleared, go to Step 4.
    - h. Upon a reboot, the system will clean the /tmp directory.  
To reboot the system issue the # shutdown -r now command.
    - i. Re-run `syscheck`  
If the alarm is cleared, the problem is solved. If the alarm is not cleared, go to the next Step.
  7. Execute the following steps if the file system reported by `syscheck` is /var, otherwise skip to Step 10:
    - a. Log in to the server generating the alarm as the root user:  
Login: root  
Password:<Enter root password>



- b. Change to the `/var/tmp` directory: `# cd /var/tmp`
  - c. Confirm that you are in the `/var/tmp` directory: `# pwd`, then `/var/tmp`
  - d. When the `pwd` command is executed, if `/var/tmp` is not output, go back to Step 5.
  - e. Since all files in this directory can be safely deleted, execute the `rm *` command to delete all files from the directory: `# rm -i *`.
  - f. Re-run `syscheck`  
If the alarm is cleared, the problem is solved. If the alarm is not cleared, go to Step 10.
8. Execute the following steps if the file system reported by `syscheck` is `/var/TKLC`, otherwise skip to Step 10.
    - a. Log in to the server generating the alarm as the root user:  
Login: root  
Password:<Enter root password>
    - b. Change to the `/var/TKLC/upgrade` directory: `# cd /var/TKLC/upgrade`
    - c. Confirm that you are in the `/var/TKLC/upgrade` directory: `# pwd`, then `/var/TKLC/upgrade`
    - d. When the `pwd` command is executed, if `/var/tmp` is not output, go back to Step 5.
    - e. Since all files in this directory can be safely deleted, execute the `rm *` command to delete all files from the directory: `# rm -i *`.
    - f. Re-run `syscheck`  
If the alarm is cleared, the problem is solved. If the alarm is not cleared, go to Step 10.
  9. For any other file system, execute the following command, where `<mountpoint>` is the file system's mount point: `# find <mountpoint> -type f -exec du -k {} \; | sort -nr > /tmp/file_sizes.txt`  
This will produce a list of files in the given file system sorted by file size in the file `/tmp/file_sizes.txt`.

 **Note:**

The `find` command above may take a few minutes to complete if the given `mountpoint` contains many files. Do not delete any files unless care certain that they are not needed. Continue to Step 10.

10. Run `savelogs` to gather all application logs (see [Saving Logs Using the LSMS GUI or Command Line](#)).
11. Contact My Oracle Support.

### B.7.4.9 3000000000002000 - Server Default Route Network Error

This alarm indicates that the default network route of the server is experiencing a problem. Running `syscheck` in Verbose mode will provide information about which type of problem.

 **Caution:**

When changing the network routing configuration of the server, verify that the modifications will not impact the method of connectivity for the current login session. The route information must be entered correctly and set to the correct values. Incorrectly modifying the routing configuration of the server may result in total loss of remote network access.

**Recovery**

1. Run `syscheck` in Verbose mode.

The output should indicate one of the following errors:

- The default router at `<IP_address>` cannot be pinged.

This error indicates that the router may not be operating or is unreachable. If the `syscheck` Verbose output returns this error, go to the next Step.

- The default route is not on the provisioning network.

This error indicates that the default route has been defined in the wrong network. If the `syscheck` Verbose output returns this error, go to Step 3.

- An active route cannot be found for a configured default route.

This error indicates that a mismatch exists between the active configuration and the stored configuration. If the `syscheck` Verbose output returns this error, go to Step 4.

 **Note:**

If the `syscheck` Verbose output does not indicate one of the errors above, go to step 5.

2. Perform the following substeps when `syscheck` Verbose output indicates:

The default router at `<IP_address>` cannot be pinged

- a. Verify that the network cables are firmly attached to the server, network switch, router, Ethernet switch or hub, and any other connection points.
- b. Verify that the configured router is functioning properly.  
Request that the network administrator verify the router is powered on and routing traffic as required.
- c. Request that the router administrator verify that the router is configured to reply to pings on that interface.
- d. Run `syscheck`.
  - If the alarm is cleared, the problem is resolved and this procedure is complete.

- If the alarm is not cleared, go to step 5.
3. Perform Network Reconfiguration from the Command Line using `su - lsmsmgr` command. Update the default router.
  4. Contact the Customer Care Center for further assistance. Provide the `syscheck` output collected in the previous steps.

## B.7.4.10 3000000000004000 - Server Temperature Error

**Alarm Type:** TPD

**Description:** The internal temperature within the server is unacceptably high.

**Severity:** Major

**OID:** TpdTemperatureErrorNotify 1.3.6.1.4.1.323.5.3.18.3.1.2.15

**Alarm ID:** TKSPLATMA15300000000004000

### Recovery

1. Ensure that nothing is blocking the fan's intake. Remove any blockage.
2. Verify that the temperature in the room is normal with the following table. If it is too hot, lower the temperature in the room to an acceptable level.

**Table B-180 Server Environmental Conditions**

|                                            |                                                                                                                                                                                                                |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient Temperature                        | Operating: 5 degrees C to 40 degrees C<br>Exceptional Operating Limit: 0 degrees C to 50 degrees C<br>Storage: -20 degrees C to 60 degrees C                                                                   |
| Ambient Temperature                        | Operating: 5° C to 35° C<br>Storage: -20° C to 60° C                                                                                                                                                           |
| Relative Humidity                          | Operating: 5% to 85% non-condensing<br>Storage: 5% to 950% non-condensing                                                                                                                                      |
| Elevation                                  | Operating: -300m to +300m<br>Storage: -300m to +1200m                                                                                                                                                          |
| Heating, Ventilation, and Air Conditioning | Capacity must compensate for up to 5100 BTUs/hr for each installed frame.<br>Calculate HVAC capacity as follows:<br>Determine the wattage of the installed equipment. Use the formula: watts x 3.143 = BTUs/hr |

### Note:

Be prepared to wait the appropriate period of time before continuing with the next step. Conditions need to be below alarm thresholds consistently for the alarm to clear. The alarm may take up to five minutes to clear after conditions improve. It may take about ten minutes after the room returns to an acceptable temperature before syscheck shows the alarm cleared.

3. Verify that the temperature in the room is normal. If it is too hot, lower the temperature in the room to an acceptable level.

 **Note:**

Be prepared to wait the appropriate period of time before continuing with the next step. Conditions need to be below alarm thresholds consistently for the alarm to clear. It may take about ten minutes after the room returns to an acceptable temperature before the alarm cleared.

4. Run syscheck Check to see if the alarm has cleared
  - If the alarm has been cleared, the problem is resolved.
  - If the alarm has not been cleared, continue with the next step.
5. Run syscheck Check to see if the alarm has cleared
  - If the alarm has been cleared, the problem is resolved.
  - If the alarm has not been cleared, continue with the next step.
6. Replace the filter (refer to the appropriate hardware manual).

 **Note:**

Be prepared to wait the appropriate period of time before continuing with the next step. Conditions need to be below alarm thresholds consistently for the alarm to clear. The alarm may take up to five minutes to clear after conditions improve. It may take about ten minutes after the filter is replaced before syscheck shows the alarm cleared.

7. Run syscheck.
  - If the alarm has been cleared, the problem is resolved.
  - If the alarm has not been cleared, continue with the next step.
8. If the problem has not been resolved, contact My Oracle Support.

### B.7.4.11 3000000000008000 - Server Mainboard Voltage Error

This alarm indicates that at least one monitored voltages on the server mainboard is not within the normal operating range.

**Recovery**

- Contact My Oracle Support for assistance.

### B.7.4.12 3000000000010000 - Server Power Feed Error

This alarm indicates that one of the power feeds to the server has failed.

**Recovery**

1. Locate the server supplied by the faulty power feed. Verify that all connections to the power supply units are connected securely. To determine where the cables connect to the

servers, see the Power Connections and Cables page of the NAS on LSMS E5-APP-B Interconnect.

2. Run `syscheck`.
  - a. If the alarm is cleared, the problem is resolved.
  - b. If the alarm is not cleared, go to the next step.
3. Trace the power feed to its connection on the power source.  
Verify that the power source is on and that the power feed is properly secured.
4. Run `syscheck`.
  - a. If the alarm is cleared, the problem is resolved.
  - b. If the alarm is not cleared, go to the next step.
5. If the power source is functioning properly and all connections are secure, request that an electrician check the voltage on the power feed.
6. Run `syscheck`.
  - a. If the alarm is cleared, the problem is resolved.
  - b. If the alarm is not cleared, go to the next step.
7. If the problem is not resolved, contact My Oracle Support for assistance.
8. Run `savelogs_plat` to gather system information for further troubleshooting, (see [Saving Logs Using the LSMS GUI or Command Line](#)), and contact My Oracle Support..

#### B.7.4.13 3000000000020000 - Server Disk Health Test Error

This alarm indicates that the hard drive has failed or failure is imminent.

##### Recovery

- Immediately contact My Oracle Support for assistance with a disk replacement.

#### B.7.4.14 3000000000040000 - Server Disk Unavailable Error

This alarm indicates that the `smartd` service is not able to read the disk status because the disk has other problems that are reported by other alarms. This alarm appears only while a server is booting.

##### Recovery

- Perform the recovery procedures for the other alarms that accompany this alarm.

#### B.7.4.15 3000000000080000 - Device Error

This alarm indicates that the offboard storage server has a problem with its disk volume filling.

##### Recovery

- Contact My Oracle Support for assistance.

#### B.7.4.16 3000000000100000 - Device Interface Error

This alarm indicates that the IP bond is either not configured or not functioning.

**Recovery**

- Contact My Oracle Support for assistance.

**B.7.4.17 3000000400000000 - Multipath device access link problem****Alarm Type:** TPD

**Description:** One or more "access paths" of a multipath device are failing or are not healthy, or the multipath device does not exist.

**Severity:** Major

**OID:** TpdMpathDeviceProblemNotify1.3.6.1.4.1.323.5.3.18.3.1.2.35

**Alarm ID:** TKSPLATMA353000000400000000

**Recovery**

1. My Oracle Support should do the following:
  - a. Check in the MSA administration console (web-application) that correct "volumes" on MSA exist, and read/write access is granted to the blade server.
  - b. Check if multipath daemon/service is running on the blade server: service multipathd status. Resolution:
    - i. start multipathd: service multipathd start
  - c. Check output of "multipath -ll": it shows all multipath devices existing in the system and their access paths; check that particular /dev/sdX devices exist. This may be due to SCSI bus and/or FC HBAs haven't been rescanned to see if new devices exist. Resolution:
    - i. run "/opt/hp/hp\_fibreutils/hp\_rescan -a",
    - ii. "echo 1 > /sys/class/fc\_host/host\*/issue\_lip",
    - iii. "echo '- - -' > /sys/class/scsi\_host/host\*/scan"
  - d. Check if syscheck::disk::multipath test is configured to monitor right multipath devices and its access paths: see output of "multipath -ll" and compare them to "syscheckAdm disk multipath -get -var=MPATH\_LINKS" output. Resolution:
    - i. configure disk::multipath check correctly.
2. Contact My Oracle Support.

**B.7.4.18 3000000800000000 – Switch Link Down Error**

This alarm indicates that the switch is reporting that the link is down. The link that is down is reported in the alarm. For example, port 1/1/2 is reported as 1102.

**Recovery Procedure:**

1. Verify cabling between the offending port and remote side.
2. Verify networking on the remote end.
3. If problem persists, contact My Oracle Support to verify port settings on both the server and the switch.

### B.7.4.19 3000001000000000 - Half-open Socket Limit

**Alarm Type:** TPD

**Description:** This alarm indicates that the number of half open TCP sockets has reached the major threshold. This problem is caused by a remote system failing to complete the TCP 3-way handshake.

**Severity:** Major

**OID:** tpdHalfOpenSocketLimit 1.3.6.1.4.1.323.5.3.18.3.1.2.37

**Alarm ID:** TKSPLATMA37 3000001000000000

**Recovery**

- Contact My Oracle Support.

### B.7.4.20 3000002000000000 - Flash Program Failure

**Alarm Type:** TPD

**Description:** This alarm indicates there was an error while trying to update the firmware flash on the E5-APP-B cards.

**Severity:** Major

**OID:** tpdFlashProgramFailure 1.3.6.1.4.1.323.5.3.18.3.1.2.38

**Alarm ID:** TKSPLATMA383000002000000000

**Recovery**

- Contact My Oracle Support.

### B.7.4.21 3000004000000000 - Serial Mezzanine Unseated

**Alarm Type:** TPD

**Description:** This alarm indicates the serial mezzanine board was not properly seated.

**Severity:** Major

**OID:** tpdSerialMezzUnseated 1.3.6.1.4.1.323.5.3.18.3.1.2.39

**Alarm ID:** TKSPLATMA393000004000000000

**Recovery**

- Contact My Oracle Support.

### B.7.4.22 3000000008000000 - Server HA Keepalive Error

This alarm indicates that heartbeat process has detected that it has failed to receive a heartbeat packet within the timeout period.

**Recovery**

1. Determine if the mate server is currently operating. If the mate server is not operating, attempt to restore it to operation.
2. Determine if the keepalive interface is operating.
3. Determine if heartbeat is running (service TKLCha status).
4. Contact My Oracle Support for assistance.

### B.7.4.23 30000000010000000 - DRBD block device can not be mounted

This alarm indicates that DRBD is not functioning properly on the local server. The DRBD state (disk state, node state, or connection state) indicates a problem.

#### Recovery

- Contact My Oracle Support for assistance.

### B.7.4.24 30000000020000000 - DRBD block device is not being replicated to peer

This alarm indicates that DRBD is not replicating to the peer server. Usually this alarm indicates that DRBD is not connected to the peer server. A DRBD Split Brain may have occurred.

#### Recovery

1. Determine if the mate server is currently operating.
2. Contact My Oracle Support for assistance.

### B.7.4.25 30000000040000000 - DRBD peer needs intervention

This alarm indicates that DRBD is not functioning properly on the peer server. DRBD is connected to the peer server, but the DRBD state on the peer server is either unknown or indicates a problem.

#### Recovery

- Contact My Oracle Support for assistance.

## B.7.5 Minor Platform Alarms

Minor platform alarms involve disk space, application processes, **RAM**, and configuration errors.

### B.7.5.1 50000000000000001 - Server Disk Space Shortage Warning

This alarm indicates that one of the following conditions has occurred:

- A file system has exceeded a warning threshold, which means that more than 80% (but less than 90%) of the available disk storage has been used on the file system.
- More than 80% (but less than 90%) of the total number of available files have been allocated on the file system.

#### Recovery

1. Run `syscheck`.



2. Examine the `syscheck` output to determine if the file system `/var/TKLC/lsmc/free` is low on space. If it is, continue to the next step; otherwise go to Step 4.
3. If possible, recover space on the free partition by deleting unnecessary files:
  - a. Log in to the server generating the alarm as the root user:  
Login: `root`  
Password: <Enter root password>
  - b. Change to the `/var/TKLC/lsmc/free` directory: # `cd /var/TKLC/lsmc/free`
  - c. Confirm that you are in the `/var/TKLC/lsmc/free` directory: # `pwd /var/TKLC/lsmc/free`
  - d. When the `pwd` command is executed, if `/var/TKLC/lsmc/free` is not output, go back to Sub-step b
  - e. List files to be deleted and delete them using the `rm` command
  - f. Re-run `syscheck`If the alarm is cleared, the problem is solved. If the alarm is not cleared, go to the next Step.
4. Run `saveLogs` to gather all application logs (see [Saving Logs Using the LSMS GUI or Command Line](#)).
5. Contact My Oracle Support.

### B.7.5.2 5000000000000002 - Server Application Process Error

This alarm indicates that either the minimum number of instances for a required process are not currently running or too many instances of a required process are running.

#### Recovery

1. Contact My Oracle Support.
2. If a [3000000000000020 - Server Platform Process Error](#) alarm is also present, execute the recovery procedure associated with that alarm before proceeding.
3. Log in to the LSMS CLI using root password.
4. Stop the LSMS application.
5. Start the LSMS Application.
6. Capture the log files on both LSMSs (see [Saving Logs Using the LSMS GUI or Command Line](#)) and contact My Oracle Support.

### B.7.5.3 5000000000000004 - Server Hardware Configuration Error

This alarm indicates that one or more of the server's hardware components are not in compliance with proper specifications (refer to *Application B Card Hardware and Installation Guide*).

#### Recovery

1. Run `syscheck` in verbose mode.
2. Contact My Oracle Support for assistance.

### B.7.5.4 5000000000000008 - Server RAM Shortage Warning

This alarm indicates one of two conditions:

- Less memory than the expected amount is installed.
- The system is swapping pages in and out of physical memory at a fast rate, indicating a possible degradation in system performance.

This alarm may not clear immediately when conditions fall below the alarm threshold. Conditions must be below the alarm threshold consistently for the alarm to clear. The alarm may take up to five minutes to clear after conditions improve.

#### Recovery

- Contact My Oracle Support for assistance.

### B.7.5.5 5000000000000020 - Server Swap Space Shortage Warning

This alarm indicates that the swap space available on the server is less than expected. This is usually caused by a process that has allocated a very large amount of memory over time.

#### Note:

In order for this alarm to clear, the underlying failure condition must be consistently undetected for a number of polling intervals. Therefore, the alarm may continue to be reported for several minutes after corrective actions are completed.

#### Recovery

- Contact My Oracle Support for assistance.

### B.7.5.6 5000000000000040 - Server Default Router Not Defined

This alarm indicates that the default network route is either not configured or the current configuration contains an invalid **IP** address or hostname.

#### Caution:

When changing the server's network routing configuration it is important to verify that the modifications will not impact the method of connectivity for the current login session. It is also crucial that this information not be entered incorrectly or set to improper values. Incorrectly modifying the server's routing configuration may result in total loss of remote network access.

#### Recovery

- To define the default router:
  1. Obtain the proper Provisioning Network netmask and the IP address of the appropriate Default Route on the provisioning network. These are maintained by the customer network administrators.

2. Log in to the LSMS CLI from lsmspri server with username `root` and run `su - lsmsmgr`
3. Select **Network Configuration Menu**, from the LSMS Configuration Menu
4. Select **Network Reconfiguration Menu** from the Network Configuration Menu. The following warning appears:  
  
WARNING: This action is service impacting. Are you sure?
5. Chose yes. This displays the configuration screen. See the *Configuration Guide* for Initial Configuration information.
6. Do the configuration.
7. Exit from the lsmsmgr menu.
8. Run `syscheck` again. If the alarm has not been cleared, go to Sub-step j.
9. Run `savelogs` to gather all application logs.
10. Contact My Oracle Support.

### B.7.5.7 50000000000000080 – Server temperature warning

**Alarm Type:** TPD

**Description:** This alarm indicates that the internal temperature within the server is outside of the normal operating range. A server Fan Failure may also exist along with the Server Temperature Warning.

**Severity:** Minor

**OID:** tpdTemperatureWarningNotify 1.3.6.1.4.1.323.5.3.18.3.1.3.8

**Alarm ID:** TKSPLATMI85000000000000080

**Recovery**

1. Ensure that nothing is blocking the fan's intake. Remove any blockage.
2. Verify that the temperature in the room is normal. If it is too hot, lower the temperature in the room to an acceptable level.

**Table B-181 Server Environmental Conditions**

|                                            |                                                                                                                                                                                                                |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient Temperature                        | Operating: 5 degrees C to 40 degrees C<br>Exceptional Operating Limit: 0 degrees C to 50 degrees C<br>Storage: -20 degrees C to 60 degrees C                                                                   |
| Relative Humidity                          | Operating: 5% to 85% non-condensing<br>Storage: 5% to 95% non-condensing                                                                                                                                       |
| Elevation                                  | Operating: -300m to +300m<br>Storage: -300m to +1200m                                                                                                                                                          |
| Heating, Ventilation, and Air Conditioning | Capacity must compensate for up to 5100 BTUs/hr for each installed frame.<br>Calculate HVAC capacity as follows:<br>Determine the wattage of the installed equipment. Use the formula: watts x 3.143 = BTUs/hr |

 **Note:**

Be prepared to wait the appropriate period of time before continuing with the next step. Conditions need to be below alarm thresholds consistently for the alarm to clear. The alarm may take up to five minutes to clear after conditions improve. It may take about ten minutes after the room returns to an acceptable temperature before syscheck shows the alarm cleared.

3. Verify that the temperature in the room is normal. If it is too hot, lower the temperature in the room to an acceptable level.

 **Note:**

Be prepared to wait the appropriate period of time before continuing with the next step. Conditions need to be below alarm thresholds consistently for the alarm to clear. It may take about ten minutes after the room returns to an acceptable temperature before the alarm cleared.

4. Run syscheck to see if the alarm has cleared
  - If the alarm has been cleared, the problem is resolved.
  - If the alarm has not been cleared, continue with the next step.
5. Replace the filter (refer to the appropriate hardware manual).

 **Note:**

Be prepared to wait the appropriate period of time before continuing with the next step. Conditions need to be below alarm thresholds consistently for the alarm to clear. It may take about ten minutes after the filter is replaced before the alarm cleared.

6. Run syscheck to see if the alarm has cleared
  - If the alarm has been cleared, the problem is resolved.
  - If the alarm has not been cleared, contact My Oracle Support and provide the system health check output.

### B.7.5.8 5000000000000100 - Server Core File Detected

This alarm indicates that an application process has failed and debug information is available.

#### Recovery

1. Run `syscheck` in verbose mode.
2. Run `savelogs` to gather system information (see [Saving Logs Using the LSMS GUI or Command Line](#)).
3. Contact My Oracle Support.

### B.7.5.9 5000000000000200 - Server NTP Daemon Not Synchronized

This alarm indicates that the **NTP daemon** (background process) has been unable to locate a server to provide an acceptable time reference for synchronization.

**Severity:** Minor

**Alarm ID:** TKSPLATMI10

**Recovery**

- Contact My Oracle Support.

### B.7.5.10 5000000000000400 - Server CMOS Battery Voltage Low

The presence of this alarm indicates that the **CMOS** battery voltage has been detected to be below the expected value. This alarm is an early warning indicator of **CMOS** battery end-of-life failure which will cause problems in the event the server is powered off.

**Recovery**

- Contact My Oracle Support.

### B.7.5.11 5000000000000800 - Server Disk Self Test Warning

A non-fatal disk issue (such as a sector cannot be read) exists.

**Recovery**

- Contact My Oracle Support.

### B.7.5.12 5000000000001000 - Device Warning

This alarm indicates that either a `snmpget` cannot be performed on the configured SNMP OID or the returned value failed the specified comparison operation.

**Recovery**

1. Run `syscheck` in Verbose mode.
2. Contact My Oracle Support for assistance.

### B.7.5.13 5000000000002000 - Device Interface Warning

This alarm can be generated by either an SNMP trap or an IP bond error. If `syscheck` is configured to receive SNMP traps, this alarm indicates that a SNMP trap was received with the `set` state. If `syscheck` is configured for IP bond monitoring, this alarm can mean that a slave device is not operating, a primary device is not active, or `syscheck` is unable to read bonding information from interface configuration files.

**Recovery**

1. Run `syscheck` in Verbose mode.
2. Contact My Oracle Support for assistance.

#### B.7.5.14 5000000000004000 - Server Reboot Watchdog Initiated

This alarm indicates that the server has been rebooted due to a hardware watchdog.

##### **Recovery**

- Contact My Oracle Support.
- This condition should never happen.

#### B.7.5.15 5000000000008000 - Server HA Failover Inhibited

This alarm indicates that the server has been inhibited and HA failover is prevented from occurring.

##### **Recovery**

- Contact My Oracle Support for assistance.

#### B.7.5.16 5000000000010000 - Server HA Active To Standby Transition

This alarm indicates that the server is in the process of transitioning HA state from Active to Standby.

##### **Recovery**

- Contact My Oracle Support for assistance.

#### B.7.5.17 5000000000020000 - Server HA Standby To Active Transition

This alarm indicates that the server is in the process of transitioning HA state from Standby to Active.

##### **Recovery**

- Contact My Oracle Support for assistance.

#### B.7.5.18 5000000000040000 - Platform Health Check Failure

This alarm indicates a `syscheck` configuration error.

##### **Recovery**

- Contact My Oracle Support for assistance.

#### B.7.5.19 5000000000080000 - NTP Offset Check Failure

This alarm indicates that time on the server is outside the acceptable range or offset from the NTP server. The alarm message provides the offset value of the server from the NTP server and the offset limit set for the system by the application.

**Alarm Type:** TPD

**Severity:** Minor

**Alarm ID:** TKSPLATMI20

**Recovery**

- Contact My Oracle Support for assistance.

**B.7.5.20 5000000000100000 - NTP Stratum Check Failure**

This alarm indicates that NTP is syncing to a server, but the stratum level of the NTP server is outside the acceptable limit. The alarm message provides the stratum value of the NTP server and the stratum limit set for the system by the application.

**Recovery**

- Contact My Oracle Support for assistance.

**B.7.5.21 5000000020000000 – Server Kernel Dump File Detected**

**Alarm Type:** TPD

**Description:** This alarm indicates that the kernel has crashed and debug information is available.

**Severity:** Minor

**OID:** 1.3.6.1.4.1.323.5.3.18.3.1.3.30

**Alarm ID:** TKSPLATMI305000000020000000

**Recovery**

- Contact My Oracle Support.

**B.7.5.22 5000000040000000 – TPD Upgrade Failed**

**Alarm Type:** TPD

**Description:** This alarm indicates that a TPD upgrade has failed.

**Severity:** Minor

**OID:** tpdServerUpgradeFailDetectedNotify 1.3.6.1.4.1.323.5.3.18.3.1.3.31

**Alarm ID:** TKSPLATMI315000000040000000

**Recovery**

1. Run the following command to clear the alarm.  
`/usr/TKLC/plat/bin/alarmMgr -clear TKSPLATMI31`
2. Contact My Oracle Support.

**B.7.5.23 5000000080000000 - Half Open Socket Warning Limit**

**Alarm Type:** TPD

This alarm indicates that the number of half open TCP sockets has reached the major threshold. This problem is caused by a remote system failing to complete the TCP 3-way handshake.

**Severity:** Minor

**OID:** tpdHalfOpenSocketWarningNotify1.3.6.1.4.1.323.5.3.18.3.1.3.32

**Alarm ID:** TKSPLATMI325000000080000s000

**Recovery**

1. Run `syscheck`.
2. Contact the Customer Care Center and provide the system health check output.

## B.7.5.24 5000000000200000 - SAS Presence Sensor Missing

This alarm indicates that the server drive sensor is not working.

**Recovery**

- Contact My Oracle Support for assistance with a replacement server.

## B.7.5.25 5000000000400000 - SAS Drive Missing

This alarm indicates that the number of drives configured for this server is not being detected.

**Recovery**

- Contact My Oracle Support to determine if the alarm is caused by a failed drive or failed configuration.

## B.7.5.26 5000000000800000 - DRBD failover busy

This alarm indicates that a DRBD sync is in progress from the peer server to the local server. The local server is not ready to be the primary DRBD node because its data is not current.

**Recovery**

1. Wait for approximately 20 minutes, then check if the DRBD sync has completed. A DRBD sync should take no more than 15 minutes to complete.
2. If the alarm persists longer than this time interval, contact My Oracle Support for assistance.

## B.7.5.27 5000000001000000 - HP disk resync

This alarm indicates that the HP disk subsystem is currently resyncing after a failed or replaced drive, or after another change in the configuration of the HP disk subsystem. The output of the message will include the disk that is resyncing and the percentage complete. This alarm eventually clears after the resync of the disk is completed. The time to clear is dependant on the size of the disk and the amount of activity on the system..

**Recovery**

1. Run `syscheck` in Verbose mode.
2. If the percent recovering is not updating, wait at least 5 minutes between subsequent runs of `syscheck`, then contact My Oracle Support with the `syscheck` output.

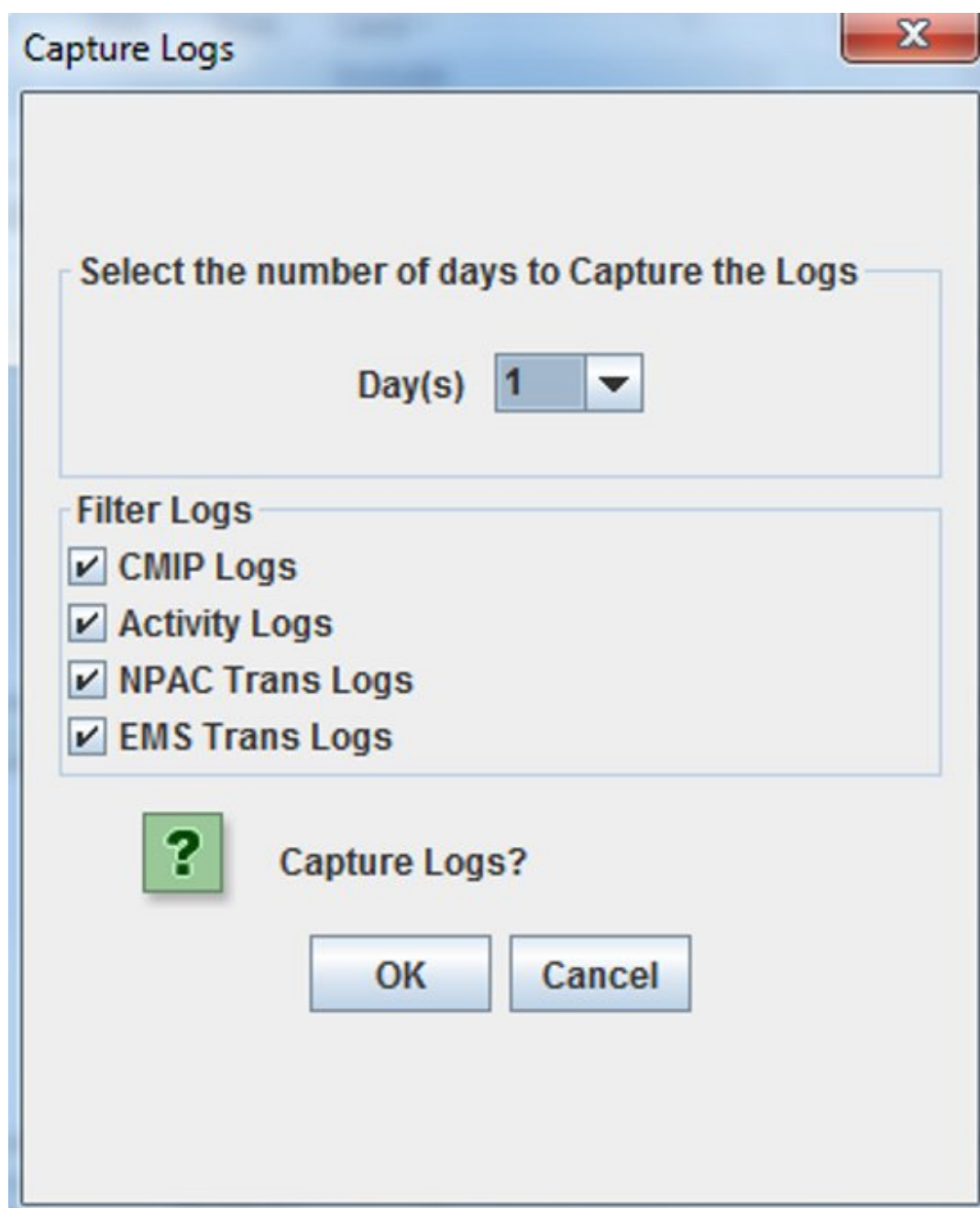


## B.7.6 Saving Logs Using the LSMS GUI or Command Line

During some corrective procedures, it may be necessary to provide Oracle Communications with information about the LSMS for help in clearing an alarm. These log files are used to aid My Oracle Support when troubleshooting the LSMS.

Use the following procedure to save logs using menu selections from the LSMS GUI.

1. Log in to the User Interface screen of the LSMS GUI (see [Starting a Web-Based LSMS GUI Session](#)).
2. From the menu, select **Logs>Capture Logs**.



3. Select the number of days for which you want to capture the logs, as well as the specific logs, and click **OK**.
4. To capture logs from the Command Line, enter the following command: `/usr/TKLC/  
plat/sbin/savelogs_plat`

# C

## Downloading Files from an NPAC to the LSMS

This chapter describes how you can manually **FTP** bulk data download (**BDD**) files from the **NPAC** to the **LSMS** and merge those data files into an **LSMS** regional database.

### C.1 Overview

This chapter describes how you can manually **FTP** bulk data download (**BDD**) files from the **NPAC** to the **LSMS** and merge those data files into an **LSMS** regional database.

Following are some examples of situations in which you would use the **BDD** procedure described in this chapter (see [NPAC-LSMS Download Procedure](#)):

- To perform a download of **NPAC** data after an **LSMS** site failure (for more information about restoring an **LSMS** site, see [Recovering from Site Failures](#))
- To perform a download of **NPAC** data when migrating an **LSMS**
- To update **NPA** split information as part of a procedure to correct an active **NPA** Split Entry made in error (for more information about this procedure, refer to “Reversing (Correcting) an **NPA** Split Entry Made in Error” in the *Database Administrator's Guide*)

#### Time Range BDD and Object BDD/Object Range BDD



#### Note:

Object ranges are used so that potentially very large files can be broken down into smaller files based on **NPA-NXX** (for **SVs**) or **NPA-NXX-X** (for **NPBs**) ranges. Because of the much smaller number of **LRN**, **NPA-NXX**, **NPA-NXX-X**, or **SPID** objects, ranges are not supported for these data file types.

If you have installed the optional feature, **NANC 3.2 Mass Update of SPID and BDD Enhancements**, you can download files either for objects/object ranges or for time ranges (however, time range files are not supported for **SPIDs**).

Whenever you need to perform a download after a site failure or when migrating an **LSMS**, determine if it necessary to perform an Object **BDD**/Object Range **BDD**, or whether a Time Range **BDD** would suffice; a Time Range **BDD** can take many hours less to complete than an Object **BDD**/Object Range **BDD**.

Primarily, a Time Range **BDD** differs from an Object **BDD**/Object Range **BDD** in that:

- Each entry in the Time Range **BDD** file is processed as a create, modify, or delete in the **LSMS** databases; *no data* is deleted from the **LSMS** database prior to the import. Each entry in the Object **BDD**/Object Range **BDD** file is processed only as a create in the **LSMS** databases; *all data* in the **LSMS** database that meets the range criteria is deleted prior to the import.
- A Time Range **BDD** enables you to download a file from an **NPAC** that contains porting data for a specific period of time (you can specify begin and end timestamp values); an

Object Range **BDD** does not allow you to specify begin and end timestamp values (the default values, 00-00-0000000000 and 99-99-9999999999, are assumed).

 **Note:**

Time Range **SPIDBDD** files are not supported.

A Time Range **BDD** is not appropriate for correcting **NPA** Split information or **EDR** Conversion data.

## C.1.1 NPAC-LSMS Download Procedure Summary

The following procedure is an outline of the detailed procedure shown in [“NPAC-LSMS Download Procedure”](#).

 **Caution:**

The following procedure requires the connection between the **LSMS** and each regional **NPAC** that needs to have files downloaded be aborted (when you stop the regional agent in [27](#)) before the **NPAC** builds the files to be sent to the **LSMS**. The connection must be aborted so that data can be properly resynchronized after the download of files completes. Therefore, the normal transmission of **NPAC** data from the **LSMS** to the connected **NEs** will temporarily be precluded during this procedure. It is recommended that you contact My Oracle Support before performing this procedure.

 **Note:**

If an automatic or manual switchover occurs while files are being downloaded from the **NPAC** or between the time files are downloaded from the **NPAC** and the time they are imported into the **LSMS** database, perform the appropriate procedure described in [“Copying Files to Other Server If Switchover Occurs”](#).

 **Note:**

Before you start this procedure, it is recommended that you contact My Oracle Support. If you encounter any problems in the procedure, you must contact My Oracle Support.

1. Request the appropriate file from the **NPAC** for a given **SPID** and region.
2. Use **FTP** to download that file when the **NPAC** indicates the file is available.
3. Move to another folder all the files currently residing in the **NPAC** import folder (`/var/TKLC/lsms/free/data/npacftp/<region>`, where `<region>` is the region that you are importing).
4. Untar the **BDD** file (Object **BDD**/Object Range **BDD** file or Time Range **BDD** file) in this `<region>` folder using the following command:

```
tar -zxvf filename.tar.gz
```

5. Run `/usr/TKLC/lsm/bin/import <region>` for the appropriate region.
6. Answer the questions presented by the import script.

## C.2 Prerequisite Information

Before starting this procedure, obtain the following site-specific information. Record this information on your recovery preparation worksheet (see [Recovery Preparation Worksheet](#)).

- A login name and password for each supported **NPAC**. This login and password have been previously issued by the regional **NPAC**.
- The **FTP IP** address of each supported **NPAC**.
- The **FTP** directory names where the files are located on each supported **NPAC**.
- Data file names you need to download. To determine the naming convention for each type of **NPAC** data file, see [“File Naming Conventions”](#).
- Contact the **NPAC** of the region for which data files are required and request that the files you need be copied into the **NPAC**'s **FTP** directory.

## C.3 File Naming Conventions

All **BDD** file names include a creation timestamp, which is represented as **<create>**. Time Range **BDD** file names also contain start (**<start>**) and end (**<end>**) timestamps. All timestamps are represented as **DD-MM-YYYYhhmmss** where:

**DD** represents a two-digit day

**MM** represents a two-digit month

**YYYY** represents a four-digit year

**hh** represents a two-digit hour

**mm** represents a two-digit minute

**ss** represents a two-digit second

An example timestamp is 11-10-2006123015.

For Object Range **BDD** files, **<start>** is always 00-00-0000000000 and **<end>** is always 99-99-9999999999. These are the default values.

[Table C-1](#) references the pages where you can find information about file naming conventions for each data type:

**Table C-1 Determining Naming Conventions for NPAC Data Files**

| Type of Data File                                                              | See:                      |
|--------------------------------------------------------------------------------|---------------------------|
| Subscription Version (Object Ranges and Time Ranges are supported)             | <a href="#">Table C-2</a> |
| Number Pool Block (Object Ranges and Time Ranges are supported)                | <a href="#">Table C-3</a> |
| <b>LRN</b> , <b>NPA-NXX</b> , and <b>NPA-NXXX</b> (Only Objects are supported) | <a href="#">Table C-4</a> |
| <b>SPID</b> (Only Objects are supported)                                       | <a href="#">Table C-5</a> |

**Note:**

Object ranges are used so that potentially very large files can be broken down into smaller files based on **NPA-NXX** (for **SVs**) or **NPA-NXX-X** (for **NPBs**) ranges. Because of the much smaller number of **LRN**, **NPA-NXX**, **NPA-NXX-X**, or **SPID** objects, ranges are not supported for these data file types.

**Subscription Version File Naming Convention**

The file name for subscription version files is represented as **<NPANXX-NPANXX>**, which indicates the range of **NPA-NXX** values contained in the download file. The file extension values depend on whether you are requesting a file for an Object Range **BDD** or for a Time Range **BDD**, as shown in [Table C-2](#).

**Table C-2 NPAC File Naming Convention for Subscription Version Data File**

| Range Type                         | Naming Convention                                                                         |
|------------------------------------|-------------------------------------------------------------------------------------------|
| Object Range <b>BDD</b>            | <b>&lt;NPANXX-NPANXX&gt;.&lt;create&gt;<sup>2</sup>.00-00-0000000000.99-99-9999999999</b> |
| Time Range <sup>1</sup> <b>BDD</b> | <b>&lt;NPANXX-NPANXX&gt;.&lt;create&gt;.&lt;start&gt;.&lt;end&gt;<sup>2</sup></b>         |

<sup>1</sup>Time Range files are supported only if you have installed the NANC 3.2 feature

<sup>2</sup>For format of **<create>**, **<start>**, and **<end>**, see [File Naming Conventions](#).

Following are examples of uses for subscription version **BDD** files:

- If you need to bulk download all subscription versions from the **NPAC**, use the following file name:

```
<000000-999999>.<create>.00-00-0000000000.99-99-9999999999
```

- If you need to bulk download all subscription versions for a time period from midnight February 12, 2006 to midnight February 13, 2006 in a file created February 14, 2006 at 9:00 a.m., use the following file name:

```
<000000-999999>.14022006090000.12022006000000.13022006000000
```

- If you need files to correct an **NPA** split, specify three Object Range files that have the same **NPANXX** values before and after the hyphen:
  - One file with the old **NPANXX** value
  - One file with the correct new **NPANXX** value
  - One file with the erroneous new **NPANXX** value

For example, if an **NPA** split was erroneously entered from 909-860 to 123-860 instead of correctly from 909-860 to 124-860, specify the following files:

- 909860-909860
- 124860-124860
- 123860-123860

Because no file extension is specified in these files, the default values of 00-00-0000000000.99-99-9999999999 are assumed.

### Number Pool Block File Naming Convention

The file name for number pool block files is represented as <NPANXXX-NPANXXX>, which indicates the range of **EDR NPA-NXXX** values contained in the download file. The file extension values depend on whether you are requesting a file for an Object Range **BDD** or for a Time Range **BDD**, as shown in [Table C-3](#).

**Table C-3 NPAC File Naming Convention for Number Pool Block Data File**

| Range Type                                                                                             | Naming Convention                                                          |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Object Range <b>BDD</b>                                                                                | <NPANXXX-NPANXXX>.<create> <sup>2</sup> .00-00-0000000000.99-99-9999999999 |
| Time Range <sup>1</sup> <b>BDD</b>                                                                     | <NPANXXX-NPANXXX>.<create>.<start>.<end> <sup>2</sup>                      |
| <sup>1</sup> Time Range files are supported only if you have installed the NANC 3.2 feature            |                                                                            |
| <sup>2</sup> For format of <create>, <start>, and <end>, see <a href="#">File Naming Conventions</a> . |                                                                            |

These file types exist only if the **NPAC** supports Efficient Data Representation (**EDR**). Following are examples of uses for number pool block **BDD** files:

- If you need to bulk download all number pool blocks from the **NPAC**, use the following file name:

```
<0000000-9999999>.<create>.00-00-0000000000.99-99-9999999999
```

- If you need to bulk download all number pool blocks for a time period from midnight February 12, 2006 to midnight February 13, 2006 in a file created February 14, 2006 at 9:00 a.m., use the following file name:

```
<0000000-9999999>.14022006090000.12022006000000.13022006000000
```

- If you need files to correct an **NPA** split, specify three files, each with the **NPANXX** value followed by a 0 before the hyphen and the **NPANXX** value followed by a 9 after the hyphen:

- One file with the old **NPANXX** value
- One file with the correct new **NPANXX** value
- One file with the erroneous new **NPANXX** value

For example, if an **NPA** split was erroneously entered from 909-860 to 123-860 instead of correctly from 909-860 to 124-860, specify the following files:

- 9098600-9098609
- 1248600-1248609
- 1238600-1238609

Because no file extension is specified in these files, the default values of 00-00-0000000000.99-99-9999999999 are assumed.

## LRN, NPA-NXX, and NPA-NXXX File Naming Convention

### Note:

In contrast to **SVs** and **NPBs** data file types, there are a much smaller number of **LRN**, **NPA-NXX**, and **NPA-NXX-X** objects; therefore, ranges are not supported for these data file types, as shown in [Table C-4](#).

- The file name for **LRN** files is represented as <LRN>, which indicates the **LRN** value contained in the download file.
- The file name for **NPA-NXX** files is represented as <NPANXX>, which indicates the **NPA-NXX** value contained in the download file.
- The file name for **NPA-NXXX** files is represented as <NPANXXX>, which indicates the **EDR NPA-NXXX** value contained in the download file. This file type exists only if the **NPAC** supports Efficient Data Representation (**EDR**).

The file extension values depend on whether you are requesting a file for an Object **BDD** or for a Time Range **BDD**, as shown in [Table C-4](#).

**Table C-4 NPAC File Naming Convention for LRN, NPA-NXX, and NPA-NXXX Network Data Files**

| Type                                                                                                   | Naming Convention                                                 |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| Object <b>BDD</b>                                                                                      | <LRN>.<create> <sup>2</sup> .00-00-0000000000.99-99-9999999999    |
|                                                                                                        | <NPANXX>.<create> <sup>2</sup> .00-00-0000000000.99-99-9999999999 |
|                                                                                                        | <NPANXX>.<create> <sup>2</sup> .00-00-0000000000.99-99-9999999999 |
| Time Range <sup>1</sup> <b>BDD</b>                                                                     | <LRN>.<create>.<start>.<end> <sup>2</sup>                         |
|                                                                                                        | <NPANXX>.<create>.<start>.<end> <sup>2</sup>                      |
|                                                                                                        | <NPANXXX>.<create>.<start>.<end> <sup>2</sup>                     |
| <sup>1</sup> Time Range files are supported only if you have installed the NANC3.2 feature             |                                                                   |
| <sup>2</sup> For format of <create>, <start>, and <end>, see <a href="#">File Naming Conventions</a> . |                                                                   |

## SPID File Naming Convention

### Note:

In contrast to **SVs** and **NPBs** data file types, there is a much smaller number of **SPID** objects; therefore, ranges are not supported for this data file type, as shown in [Table C-5](#).

The **SPID** naming convention only applies to Object **BDD** files; Time Range is not supported. The file name for **SPID** files is represented as <SPID>, which indicates the **SPID** value contained in the download file..



**Table C-5 NPAC File Naming Convention for SPID Network Data File**

| Type              | Naming Convention                                               |
|-------------------|-----------------------------------------------------------------|
| Object <b>BDD</b> | <SPID>.<create> <sup>2</sup> .00-00-0000000000.99-99-9999999999 |

<sup>2</sup> For format of <create>, <start>, and <end>, see [File Naming Conventions](#).

Only the <create> timestamp field is supported.

Because no file extension is specified in these files, the default values of 00-00-0000000000.99-99-9999999999 are assumed.

## C.4 NPAC-LSMS Download Procedure

Use the following procedure to perform a download of files from an **NPAC** to the **LSMS**. The example output shown in the procedure is for Time Range **BDD** files that include Number Pooling Efficient Data Representation (**EDR**). File formats for other download types vary, as described in [File Naming Conventions](#). For more information about **EDR**, refer to the *Database Administrator's Guide*.

### Note:

Before you start this procedure, it is recommended that you contact My Oracle Support. If you encounter any problems in the procedure, you must contact My Oracle Support.

### Caution:

The following procedure requires the connection between the **LSMS** and each regional **NPAC** that needs to have files downloaded be aborted (when you stop the regional agent in step 26) before the **NPAC** builds the files to be sent to the **LSMS**. The connection must be aborted so that data can be properly resynchronized after the download of files completes. Therefore, the normal transmission of **NPAC** data from the **LSMS** to the connected **NEs** will temporarily be precluded during this procedure. It is recommended that you contact My Oracle Support before performing this procedure.

### Note:

If an automatic or manual switchover occurs while files are being downloaded from the **NPAC** or between the time files are downloaded from the **NPAC** and the time they are imported into the **LSMS** database, perform the appropriate procedure described in [“Copying Files to Other Server If Switchover Occurs”](#).

1. Ensure that you have the necessary information, as described in [“Prerequisite Information”](#).
2. Log in to the **LSMS** active server as `lsmsadm`.

3. Change to the directory that contains the current **LSMS** version:

```
$ cd /var/TKLC/lsms/free/data/npacftp/<region>
```

4. Verify that the correct directory was accessed by entering the following command:

```
$ pwd
```

The correct output is:

```
/var/TKLC/lsms/free/data/npacftp/<region>
```

5. Determine whether any files are currently contained in this directory:

```
$ ls -l
```

6. If the output shows any files, delete them by entering the following command:

```
$ rm *
```

#### **Note:**

Though the steps in this procedure refer to the use of FTP, you may use SFTP instead.

7. Use **FTP** to connect to the **NPAC** by entering the following command, where `<NPAC_IP_address>` is the decimal version of the **NPAC's IP** address, recorded on your worksheet, as described in ["Prerequisite Information"](#):

```
$ ftp <NPAC_IP_address>
```

An example command line follows:

```
$ ftp 208.143.38.10
```

8. When prompted, enter your **NPAC** login name and password, recorded on your worksheet, as described in ["Prerequisite Information"](#).
9. Change to the **NPAC's FTP** directory by entering the following command, where `<NPAC_FTP_directory>` is the regional directory as recorded on the your worksheet that corresponds to the region selected in 3:

```
ftp> cd <NPAC_FTP_directory>
```

10. Display the contents of the **NPAC's FTP** directory by entering the following command:

```
ftp> ls
```

- Output similar to the following appears.

```
200 PORT command successful.
150 Opening ASCII mode data connection for file list.
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
SPID.07-11-2000023849
226 Transfer complete.
70 bytes received in 0.026 seconds (2.6 Kbytes/s)
```

- If you are converting a regional database to support **EDR**, output similar to the following appears:

```
200 PORT command successful.
150 Opening ASCII mode data connection for file list.
0000000-9999990.07-11-2004023849.07-10-2004023849.07-11-2004023849
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
226 Transfer complete.
20 bytes received in 0.026 seconds (2.6 Kbytes/s)
```

11. Change to noninteractive mode by entering the following command:

```
ftp> prompt
```

Output similar to the following appears:

```
Interactive mode off
```

12. Transfer the files you need as follows:

- If you are downloading files from the **NPAC** after a site failure, enter the following command to transfer all the files in the **NPAC's FTP** directory `<NPAC_FTP_directory>` to the **LSMS's** regional directory `/var/TKLC/lsms/free/data/npacftp/<region>`:  
ftp> mget \*
- If you are reversing an **NPA** split, enter commands similar to the following commands (these commands use the values from the example) to transfer the subscription files and **NPB** files for the old **NPANXX** and the erroneous new **NPANXX** from the **NPAC's FTP** directory `<NPAC_FTP_directory>` to the **LSMS's** regional directory `/var/TKLC/lsms/free/data/npacftp/<region>`:  
ftp> mget 909860\*  
  
ftp> mget 123860\*  
  
ftp> mget 124860\*
- If you are converting a regional database to support **EDR**, enter the following commands to transfer the **EDR** files from the **NPAC's FTP** directory `<NPAC_FTP_directory>` to the **LSMS's** regional directory `/var/TKLC/lsms/free/data/npacftp/<region>`:  
ftp> mget 0000000-9999999\*  
  
ftp> mget NPANXXX\*

13. Output similar to the following appears (the example shows only Time Range **BDD** files for downloading):

```
200 PORT command successful.
150 Opening BINARY mode data connection for
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849 (17979
bytes).
###
226 Transfer complete.
local: 000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
remote: 000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
17979 bytes received in 0.18 seconds (1e+02 Kbytes/s)
```

```

200 PORT command successful.
150 Opening BINARY mode data connection for
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
(17979 bytes).
###
226 Transfer complete.
local: 0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
remote: 0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
17979 bytes received in 0.18 seconds (1e+02 Kbytes/s)
200 PORT command successful.
150 Opening BINARY mode data connection for LRN.07-10-2000023849
(17979 bytes).
###
226 Transfer complete.
local: LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
remote: LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
17979 bytes received in 0.18 seconds (1e+02 Kbytes/s)
200 PORT command successful.
150 Opening BINARY mode data connection for
NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849 (124831 bytes).
#####
226 Transfer complete.
local: NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
remote: NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
124831 bytes received in 1 seconds (1.2e+02 Kbytes/s)
200 PORT command successful.
150 Opening BINARY mode data connection for
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849 (124831 bytes).
#####
226 Transfer complete.
local: NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
remote: NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
124831 bytes received in 1 seconds (1.2e+02 Kbytes/s)
200 PORT command successful.
150 Opening BINARY mode data connection for SPID.07-10-2004023849 (479
bytes).
#
226 Transfer complete.
local: SPID.07-10-2004023849 remote: 07-10-2004023849
479 bytes received in 0.018 seconds (27 Kbytes/s)

```

**14. Exit FTP by entering the following command:**

```
ftp> quit
```

**15. Ensure that the files just downloaded have appropriate permissions for all users by entering the following command:**

```
$ chmod 655 *
```

**16. Enter the following command to verify that all the files in 12 transferred and that they now have read-write permission:**

```
$ ls -l
```

Output similar to the following appears (the example shows only Time Range **BDD** files for downloading):

```
total 3188358
-rw-r-r- 1 lsmsadm lsms 1608000001 Jul 11 02:38
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
-rw-r-r- 1 lsmsadm lsms 1608000001 Jul 11 02:38
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
-rw-r-r- 1 lsmsadm lsms 780001 Jul 11 02:38
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
-rw-r-r- 1 lsmsadm lsms 6440001 Jul 11 02:38
NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
-rw-r-r- 1 lsmsadm lsms 6440001 Jul 11 02:38
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
-rw-r-r- 1 lsmsadm lsms 239990 Jul 11 02:38 SPID.07-10-2000023849
```

 **Note:**

It is recommended that you create a backup of your files before proceeding to the next step. To create a backup, enter the following command:

```
$ mkdir /var/TKLC/lsms/free/data/npacftp/<region>/save
```

17. If you need files from another **NPAC** region, repeat **3** through **16**.
18. If switchover has occurred, perform the appropriate procedure described in [“Copying Files to Other Server If Switchover Occurs”](#).
19. Untar the **BDD** file (Object Range **BDD** file or Time Range **BDD** file) in the `<region>` folder using the following command:

```
tar -zxvf filename.tar.gz
```

20. Enter the following command to display the number of lines in each bulk load file.

```
$ wc -l *
```

 **Note:**

Record the line count values (shown in **bold** below) for future reference.

```
1892 000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
0 000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
892 0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
0 0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
250 LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
0 LRN.07-10-2004023849.07-11-2004023849
23 NPANXX.07-10-2004023849.07-11-2004023849
0 NPANXX.07-10-2004023849.07-11-2004023849
12 NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
0 NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
0 SPID.07-10-2004023849
```

21. **BDD** files received from the **NPAC** require conversion before they can be imported into the **LSMS** database.

The conversion must be performed by entering the following command for each file:

```
$ cat orig_file_from_NPAC | tr "\015" "\012" > new_file_for_import
```

(The file name must be changed. Oracle recommends that you append a few characters, such as `.tr`, to the end of the file name. Maintaining most of the file name will make it easier to rename the files to the original file names, as instructed in [23](#)) For example:

```
$ cat 000000-999999.07-10-2000023849 | tr "\015" "\012" >
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849.tr
$ cat 0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849 |
tr "\015" "\012" >
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849.tr
$ cat LRN.07-10-2000023849 | tr "\015" "\012" >
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849.tr
$ cat NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849 | tr
"\015" "\012" >
NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849.tr
$ cat NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849 | tr
"\015" "\012" >
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849.tr
$ cat SPID.07-10-2004023849 | tr "\015" "\012" >
SPID.07-10-2004023849.tr
```

22. After ensuring all files have been converted, delete the original files.

```
$ rm orig_file_from_NPAC
```

For example:

```
$ rm 000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
$ rm 0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
$ rm LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
$ rm NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
$ rm NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
$ rm SPID.07-10-2004023849
```

23. Rename each of the files that were converted in [21](#) back to the original **NPAC** file names by entering the following command for each file:

```
$ mv new_file_for_import orig_filename_from_NPAC
```

For example:

```
$ mv 000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849.tr
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
$ mv 0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849.tr
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
$ mv LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849.tr
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
$ mv NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849.tr
NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
$ mv NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849.tr
```

```
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
$ mv SPID.07-10-2004023849.tr SPID.07-10-2004023849
```

24. Verify that the files were properly converted by entering the following command:

```
$ file *
```

Properly converted files will be appended with the following information, : ASCII text, as shown in the example output below.

```
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849: ASCII
text
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849: ASCII
text
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849: ASCII
text
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849: ASCII
text
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849: ASCII text
LRN.07-10-2004023849.07-11-2004023849: ASCII text
NPANXX.07-10-2004023849.07-11-2004023849: ASCII text
NPANXX.07-10-2004023849.07-11-2004023849: ASCII text
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849: ASCII text
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849: ASCII text
SPID.07-10-2004023800: ASCII text
SPID.07-10-2004023849: ASCII text
```

 **Note:**

If the files are appended with : ASCII text, with CR line terminators, then the conversion performed in 21 failed. Contact My Oracle Support.

25. If switchover has occurred, perform the appropriate procedure described in [“Copying Files to Other Server If Switchover Occurs”](#).
26. If the **SWIM** feature has been enabled, contact My Oracle Support to turn off **SWIM**.
27. Perform the following substeps to prevent the **NPAC** database from being updated while the files are being converted and copied in subsequent steps:
- Halt the **LSMS** agent for the region:  
\$ \$LSMS\_DIR/lsms stop <region>
  - From the **LSMS GUI** menu, select **Configure>LNP System>NPAC>Modify>Primary** and click the Activate Region checkbox so that is empty.  
  
For more information about this **GUI** window, refer to the *Configuration Guide*. Having this checkbox empty prevents the `sentryd` utility from attempting to automatically restart the regional agent.
28. You are now ready to run the `import` command.

 **Note:**

Do not run the `import` command while any of the following processes are also running: backups, starting a standby node (to change its state from **UNINITIALIZED "INHIBITED" to STANDBY**), running the `lsmsdb quickaudit` command, and creating query server snapshots, all of which use temporary storage space. If you try to run the `import` command while any of these processes are running, you may not have enough disk space to complete the process. Since backups can be run automatically, perform the procedure described in [“Checking for Running Backups”](#) to ensure that no backups are running.

- If you are performing this procedure as part of reversing an NPA split, converting a regional database to support EDR, importing an incremental download of files from NPAC after a site failure, or importing files for any reason other than a complete regional bulk download, go to [29](#).
- If you are performing a complete regional bulk download from the NPAC, you can save a significant amount of time (which would be required to delete all existing entries in the database) by entering the following commands, where `<region>` is the name of the NPAC region:

 **Caution:**

The following commands will delete all data in your regional database.

Log into the active server and run both of the following commands:

```
$ $LSMS_DIR/npac_db_setup remove <region>
$ $LSMS_DIR/npac_db_setup_create <region>
```

- 29.** Import data in the downloaded files into the regional database by entering the following command:

```
$ $LSMS_DIR/import [-c] <region>
```

For example:

```
$ $LSMS_DIR/import -c MidAtlantic
```

The `-c` option allows the import to continue on to the next line of the file even if errors occur. Output similar to the following indicates the progress of the **LSMS** processing:

 **Note:**

In these examples, `...` on a line by itself indicates that output occurs, but its contents are not significant to this procedure.



 **Note:**

If you do not specify the `-c` option and a failure, such as a syntax error, occurs during the import process, an error message is displayed and the import utility prompts the user with the following message: Do you want to continue (Yes/No) ? If `n` is entered, the import utility operation is aborted. If `y` is entered, the import utility aborts its operation for the current download file and continues importing the remaining specified download files.  
If such an error occurs, be sure to perform the substeps shown in 30.

- Output similar to the following appears as the LSMS deletes subscription versions, NPBs, LRNs, NPANXXs, and SPIDs in the regional LSMS database, reformats the NPAC data file, and places the data from the NPAC data file into the specified regional LSMS database.

```
NPAC FTP directory: /var/TKLC/lms/free/data/npacftp/Midwest
The following NPAC download file(s) are available for import:
 LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
 NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849

NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
SPID.07-10-2004023849
 000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
Import LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
(Yes/No/All/Quit)?all
The following NPAC download files have been chosen to be imported:
 SPID.07-10-2004023849
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849

NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
 000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
Do you want to continue (Yes/No)?yes
Beginning Delete Process for SPID.07-10-2004023849
Delete Process Completed for SPID.07-10-2004023849
Beginning Download Process for SPID.07-10-2004023849
1000 ServiceProvNetwork instances written to MidwestDB
2000 ServiceProvNetwork instances written to MidwestDB
2351 ServiceProvNetwork instances written to MidwestDB

Import completed successfully.
Download Process Completed for SPID.11-07-2001145342

Beginning Delete Process for
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
Delete Process Completed for
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849

Beginning Download Process for
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
```

```

1000 ServiceProvNPA_NXX_X instances written to MidwestDB
2000 ServiceProvNPA_NXX_X instances written to MidwestDB
3000 ServiceProvNPA_NXX_X instances written to MidwestDB
4000 ServiceProvNPA_NXX_X instances written to MidwestDB
...
30000 ServiceProvNPA_NXX_X instances written to MidwestDB
30860 ServiceProvNPA_NXX_X instances written to MidwestDB
Import completed successfully.
Download Process Completed for
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849

Beginning Delete Process for
NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849

Delete Process Completed for
NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849

Beginning Download Process for
NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849

90 ServiceProvNPA_NXX instances written to MidwestDB
1090 ServiceProvNPA_NXX instances written to MidwestDB
Import completed successfully.
Download Process Completed for
NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849

Beginning Delete Process for
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849

Delete Process Completed for
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849

Beginning Download Process for
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849

1000 ServiceProvLRN instances written to MidwestDB
2000 ServiceProvLRN instances written to MidwestDB
3000 ServiceProvLRN instances written to MidwestDB
4000 ServiceProvLRN instances written to MidwestDB
4700 ServiceProvLRN instances written to MidwestDB
5700 ServiceProvLRN instances written to MidwestDB
Import completed successfully.
Download Process Completed for
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849

Beginning Delete Process for
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849

Will drop instances of:
Drop instances of class `SubscriptionVersion'
DROPPING INSTANCES.
Delete Process Completed for
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849

Beginning Download Process for

```

```
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849

1000 SubscriptionVersion instances written to MidwestDB
2000 SubscriptionVersion instances written to MidwestDB
3000 SubscriptionVersion instances written to MidwestDB
4000 SubscriptionVersion instances written to MidwestDB
4500 SubscriptionVersion instances written to MidwestDB
Import completed successfully.
Download Process Completed for 000000-999999.11-07-2001145342

Beginning Delete Process for
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849

Will drop instances of:
Drop instances of class `NumberPoolBlock'
DROPPING INSTANCES.
Delete Process Completed for
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849

Beginning Download Process for
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849

1000 NumberPoolBlock instances written to MidwestDB
2000 NumberPoolBlock instances written to MidwestDB
Import completed successfully.
Download Process Completed for
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
Script completed.
```

- If you are reversing an **NPA** split, in this step the **LSMS** deletes all subscription versions and **NPBs** for the old **NPA-NXX** and the erroneous new **NPA-NXX** in the regional **LSMS** database, reformats the **NPAC** data file, and places the data from the **NPAC** data file into the specified regional **LSMS** database. (Example output is not shown.)
  - If you are converting a regional database to support **EDR**, in this step the **LSMS** formats the **NPAC** data file, and places the data from the **NPAC** data file into the specified regional **LSMS** database. (Example output is not shown.)
30. If you specified the `-c` option or you answered Y when prompted for any failure, such as syntax error, that occurred during the import process in 29, perform the one of the following sets of substeps:

#### **Caution:**

This step requires a working knowledge of the vi editor and detailed understanding of the contents of the files downloaded from the **NPAC**. It is recommended that My Oracle Support be contacted prior to performing this step.

If you answered Y when prompted for any failure during the import process in 29, perform these substeps:

- Examine and correct the files that were not successfully imported by entering the following command:

```
$ vi /var/TKLC/lsms/free/data/npacftp/<region>/<downloaded file>
```

For example:

```
$ vi /var/TKLC/lsms/free/data/npacftp/Midwest/
SPID.07-10-2000023849
```

- b. Delete the ^D characters added at the end of the file by the vi editor by pressing the Shift and G keys at the same time to go to the end of the file, and then typing dd to remove the last line.

- c. For each file corrected by 30 a and b, enter the following command to import the corrected file into the regional database:

```
$ $LSMS_DIR/import <region> <bulk load file>
```

- d. Go to step 31.

If you specified the -c option in 29, perform these substeps:

- a. Examine and correct the files that were not successfully imported by entering the following command:

```
$ vi /var/TKLC/lsms/free/data/npacftp/<region>/<downloaded file>
```

For example:

```
$ vi /var/TKLC/lsms/free/data/npacftp/Midwest/
SPID.07-10-2000023849_FAILED
```

- b. Correct the file as desired, and then import the file into the database by entering the following command, where <region> is the name of the **NPAC** region, <instance> is the type of instance to be imported into the database, and <filename> is the name of the file to be imported:

```
$ $LSMS_TOOLS_DIR/npacimport -r <region> -i <instance> -y
<filename>
```

31. If you are reversing an **NPA** split, go to step 34.

Otherwise, perform the following substeps:

**Table C-6 NPAC Bulk Load Files and LSMS Database Object Classes**

| NPAC Bulk Load File                                                | LSMS Database Object Class |
|--------------------------------------------------------------------|----------------------------|
| 000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849   | SubscriptionVersion        |
| 0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849 | NumberPoolBlock            |
| LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849             | ServiceProvLRN             |
| NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849          | ServiceProvNPA_NX<br>X     |
| NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849         | ServiceProvNPA_NX<br>X_X   |
| SPID.07-11-2004023849                                              | ServiceProvNetwork         |

These substeps compare the number of instances of each object type (shown in **bold** in the following examples) contained in the **NPAC** files and in the **LSMS** database.

- a. Enter the following command to display the number of lines in each bulk load file:

```
$ wc -l *
```

Output similar to the following appears:

- If you are downloading files from the **NPAC** after a site failure or during migration, output similar to the following appears. This output includes lines (shown in **bold**) used for Efficient Data Representation (**EDR**). If an **NPAC** does not support **EDR**, or if you do not have the **EDR** feature installed, lines similar to those shown in **bold** will not appear.

```

1892
000000-999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
892
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
250
LRN.07-11-2004023849.07-10-2004023849.07-11-2004023849
23
NPANXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
12
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849 5
SPID.07-10-2004023849
```

- If you are converting a regional database to support **EDR**, output similar to the following output appears.

```

892
0000000-9999999.07-11-2004023849.07-10-2004023849.07-11-2004023849
12
NPANXXX.07-11-2004023849.07-10-2004023849.07-11-2004023849
```

- b. Enter the following command to display the total number of instances of each class in the regional database:

```
$ lsmsdb -c counts -d <dbname>
```

Output similar to the following appears:

```

$ lsmsdb -c counts -d MidwestDB 892
..... MidwestDB.NumberPoolBlock 250
..... MidwestDB.ServiceProvLRN 23
..... MidwestDB.ServiceProvNPA_NXX 12
..... MidwestDB.ServiceProvNPA_NXX_X 5
..... MidwestDB.ServiceProvNetwork 1,892
..... MidwestDB.SubscriptionVersion
#
```

- c. Verify that the numbers of instances indicated in the output of 31 b (shown in **bold** in the example) match the numbers included in the output of 31 a (shown in **bold** in that example). If they do not match, repeat 28 through 30
32. If you are converting a regional database to support **EDR**, go to 34.

Otherwise, perform the following command to change the Last Change Time (**LCT**) of the regional database to match the timestamp embedded in the file name of the files obtained in 16.

```
$ chglct -r <region> -s <YYYYMMDDhhmmss>
```

Where `<region>` is the name of the **NPAC** for which you are performing the download and `<YYYYMMDDhhmmss>` is the timestamp embedded in the file name as shown in the files displayed in 16. For more information about the `chglct` command, see “[chglct](#)”.

33. Once you have verified that the region has received a "Recovery Complete" message from the **NPAC**, you may remove the "import" files from the system by repeating 2 through 6 of this procedure.

34. Restart the **LSMS** agent for the region by doing the following:

From the **LSMS GUI** menu, select **Configure**, and then **LNP System**, and then **NPAC**, and then **Modify**, and then **Primary** and click the **Activate Region** checkbox so that is checked. For more information about this **GUI** window, refer to the *Configuration Guide*. Having this checkbox checked enables the `sentryd` utility to automatically attempt to restart the regional agent.

35. If the **SWIM** feature was turned off in 26, contact the **NPAC** to have the **SWIM** list cleared for all imported regions, then contact My Oracle Support to reactivate **SWIM**.
36. If imports were performed for all active regions, go to 37. Otherwise, contact My Oracle Support to determine if time range resynchronizations are needed for regions that were not imported due to **SWIM** having been turned off temporarily.

If necessary, My Oracle Support will help the customer reassociate **LSMS** with the **NPAC** and perform manual time range resynchronizations.

37. Restart the **LSMS GUI** for the region. by entering the following command:

```
$ $LSMS_DIR/start_mgui
```

For example:

```
$ $LSMS_DIR/start_mgui
```

38. Repeat steps 21 through 37 for each **NPAC** region for which you have downloaded files.
39. For each network element supported by the **LSMS**, resynchronize the data that corresponds to the data downloaded from the **NPAC**, using one of the procedures described in *LNP Database Synchronization User's Guide*. For example:
  - If you downloaded from the **NPAC** after a site failure or during migration, perform a time range audit or a bulk download to each supported network element (refer to “Auditing and Reconciling Network Elements from the **LSMS**” or “Managing Bulk Load from the **LSMS**”).
  - If you have reversed an **NPA** split, perform an audit and reconcile procedure for subscription versions and **NPBs** in both the old **NPA-NXX** and the erroneous new **NPA-NXX** to each supported network element (refer to “Auditing and Reconciling Network Elements from the **LSMS**”).
  - If you have converted a regional database to support **EDR**, perform an audit and reconcile procedure for all **NPBs** to each supported network element (refer to “Auditing and Reconciling Network Elements from the **LSMS**”).

## C.5 Copying Files to Other Server If Switchover Occurs

When switchover (whether automatically or manually initiated) occurs, the standby server, which has been replicating the database on the active server, takes over to be the newly active server. However, any files that have been downloaded from the **NPAC** exist only on the server to which they were downloaded. If switchover occurs during a **BDD** procedure, the quickest way to get the files on the newly active server is to perform one of the procedures described in this section.

The following notifications indicate that a switchover has been initiated and completed:

```
LSMS4000|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Switchover initiated
LSMS4001|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Switchover complete
```

Perform one of the following procedures:

- If switchover occurred after all files have been downloaded from the **NPAC**, perform the procedure described in [“Copying All Downloaded Files After Switchover”](#)
- If switchover occurred while files are being downloaded from the **NPAC**, perform the procedure described in [“Copying Partially Downloaded Files After Switchover”](#)

## C.5.1 Copying All Downloaded Files After Switchover

If switchover is initiated and completed after all the files you need have been downloaded from the **NPAC** but before you have imported them into the **LSMS** database, perform the following procedure.

1. If switchover is initiated between the time all the files have been downloaded from the **NPAC** and the time they are to be imported into the **LSMS**, wait until the following notification has been reported:

```
LSMS4001|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Switchover complete
```

2. Log into the non-active server as `lsmsadm`.

3. Navigate to the directory where files have been downloaded:

```
$ cd /var/TKLC/lsms/free/data/npacftp/<region>
```

Where `<region>` is the name of the **NPAC** region for which files are being downloaded.

4. Verify that the correct directory was accessed by entering the following command:

```
$ pwd
```

The correct output is:

```
/var/TKLC/lsms/free/data/npacftp/<region>
```

5. Use the secure file transfer protocol (`sftp`) to move the files from the previously active server into the `/var/TKLC/lsms/free/data/npacftp/<region>` directory on the newly active server:

```
$ sftp lsmsadm@mate
```

When prompted, enter the `lsmsadm` password. Then the `sftp>` prompt will appear; enter the following commands at the prompt:

```
sftp> cd /var/TKLC/lsms/free/data/npacftp/<region>
```

```
sftp> mput *
```

```
sftp> bye
```

6. Proceed with the step you were performing when you were directed to this procedure.

## C.5.2 Copying Partially Downloaded Files After Switchover

If switchover is initiated and completed while files are being downloaded from the **NPAC**, some of the files may exist on the previously active server and some may exist on the newly active server. The safest procedure is to repeat the **BDD** procedure.

However, if you have already downloaded a number of files, you can choose to determine which files exist on which server and use the following procedure to copy the files that exist on the non-active server to the active server.

1. If switchover is initiated while files are being downloaded from the **NPAC**, wait until the following notification has been reported:

```
LSMS4001|14:58 Oct 22, 2005|xxxxxxx|Notify:Sys Admin - Switchover complete
```

2. Log into the non-active server as `lsmsadm`.

3. Navigate to the directory where files have been downloaded:

```
$ cd /var/TKLC/lsms/free/data/npacftp/<region>
```

Where `<region>` is the name of the **NPAC** region for which files are being downloaded.

4. Verify that the correct directory was accessed by entering the following command:

```
$ pwd
```

The correct output is:

```
/var/TKLC/lsms/free/data/npacftp/<region>
```

5. Enter the following command to list which files are stored in this directory:

```
$ ls -l
```

6. Log into the active server as `lsmsadm`.

7. Navigate to the directory where files have been downloaded:

```
$ cd /var/TKLC/lsms/free/data/npacftp/<region>
```

Where `<region>` is the name of the **NPAC** region for which files are being downloaded.

8. Verify that the correct directory was accessed by entering the following command:

```
$ pwd
```

The correct output is:

```
/var/TKLC/lsms/free/data/npacftp/<region>
```

9. Enter the following command to list which files are stored in this directory:

```
$ ls -l
```

10. Compare the files listed in 5 and 9 to determine whether all the files you need have been downloaded to one server or the other.

If any files you need are missing from both servers, perform the procedure described in [“NPAC-LSMS Download Procedure”](#) to obtain the missing files from the **NPAC**.

11. If you desire to copy any files from the non-active server to the active server, perform the remaining steps of this procedure.



12. At the previously active server, use the secure file transfer protocol (`sftp`) to move the files from the standby server into the `/var/TKLC/lms/free/data/npacftp/<region>` directory on the newly active server:

```
$ sftp lmsadm@mate
```

When prompted, enter the `lmsadm` password. Then the `sftp>` prompt will appear; enter the following commands at the prompt:

```
sftp> cd /var/TKLC/lms/free/data/npacftp/<region>
```

```
sftp> mput *
```

```
sftp> bye
```

13. Proceed with the step you were performing when you were directed to this procedure.

# D

## Worksheets

This appendix contains worksheets that you can copy and fill out with your own information.

### D.1 Introduction

This appendix contains worksheets that you can copy and fill out with your own information.

Complete the worksheet shown in [Table D-1](#) to record information that you may need during disaster recovery procedures, as described in [Recovering from Site Failures](#).

### D.2 Recovery Preparation Worksheet

In preparation for possible error situations, including disasters, record the following information, as shown in [Table D-1](#), and store it in a safe and accessible location, off-site from both the main and shadow **LSMS**. Rows are provided for up to eight **NPACs** and up to eight **EMSSs**; your **LSMS** may serve fewer **NPACs** or **EMSSs**.

**Table D-1 Recovery Preparation Worksheet**

| Information Required                                                                  | Customer Value |
|---------------------------------------------------------------------------------------|----------------|
| Obtain the following license information from My Oracle Support                       |                |
| <b>OSI</b> license key for main <b>LSMS</b> server with default server name lsmspri   |                |
| <b>OSI</b> license key for main <b>LSMS</b> server with default server name lsmssec   |                |
| <b>OSI</b> license key for shadow <b>LSMS</b> server with default server name lsmspri |                |
| <b>OSI</b> license key for shadow <b>LSMS</b> server with default server name lsmssec |                |
| <b>Main LSMS Data</b>                                                                 |                |
| Service Provider Identification (SPID)                                                |                |
| <b>LSMS</b> Version                                                                   |                |
| root password                                                                         |                |
| lsmsadm name                                                                          |                |
| lsmsadm password                                                                      |                |
| lsmsuser name                                                                         |                |
| lsmsuser password                                                                     |                |
| lsmsuext name                                                                         |                |
| lsmsuext password                                                                     |                |
| lsmsview name                                                                         |                |
| lsmsview password                                                                     |                |

**Table D-1 (Cont.) Recovery Preparation Worksheet**

| Information Required                      | Customer Value |
|-------------------------------------------|----------------|
| lsmsall name                              |                |
| lsmsall password                          |                |
| <b>Shadow LSMS Data</b>                   |                |
| Service Provider Identification (SPID)    |                |
| primary IP address (decimal)              |                |
| primary IP address (hexadecimal)          |                |
| secondary IP address (decimal)            |                |
| secondary IP address (hexadecimal)        |                |
| <b>NPAC Region 1 Name and Information</b> |                |
| FTP IP address (decimal)                  |                |
| FTP IP address (hexadecimal)              |                |
| FTP directory                             |                |
| FTP file names                            |                |
| NPAC user ID                              |                |
| NPAC password                             |                |
| LSMS key set                              |                |
| <b>NPAC Region 2 Name and Information</b> |                |
| FTP IP address (decimal)                  |                |
| FTP IP address (hexadecimal)              |                |
| FTP directory                             |                |
| FTP file names                            |                |
| NPAC user ID                              |                |
| NPAC password                             |                |
| LSMS key set                              |                |
| <b>NPAC Region 3 Name and Information</b> |                |
| FTP IP address (decimal)                  |                |
| FTP IP address (hexadecimal)              |                |
| FTP directory                             |                |
| FTP file names                            |                |
| NPAC user ID                              |                |
| NPAC password                             |                |
| LSMS key set                              |                |
| <b>NPAC Region 4 Name and Information</b> |                |
| FTP IP address (decimal)                  |                |
| FTP IP address (hexadecimal)              |                |
| FTP directory                             |                |
| FTP file names                            |                |
| NPAC user ID                              |                |
| NPAC password                             |                |

**Table D-1 (Cont.) Recovery Preparation Worksheet**

| Information Required         | Customer Value                            |
|------------------------------|-------------------------------------------|
| LSMS key set                 |                                           |
|                              | <b>NPAC Region 5 Name and Information</b> |
| FTP IP address (decimal)     |                                           |
| FTP IP address (hexadecimal) |                                           |
| FTP directory                |                                           |
| FTP file names               |                                           |
| NPAC user ID                 |                                           |
| NPAC password                |                                           |
| LSMS key set                 |                                           |
|                              | <b>NPAC Region 6 Name and Information</b> |
| FTP IP address (decimal)     |                                           |
| FTP IP address (hexadecimal) |                                           |
| FTP directory                |                                           |
| FTP file names               |                                           |
| NPAC user ID                 |                                           |
| NPAC password                |                                           |
| LSMS key set                 |                                           |
|                              | <b>NPAC Region 7 Name and Information</b> |
| FTP IP address (decimal)     |                                           |
| FTP IP address (hexadecimal) |                                           |
| FTP directory                |                                           |
| FTP file names               |                                           |
| NPAC user ID                 |                                           |
| NPAC password                |                                           |
| LSMS key set                 |                                           |
|                              | <b>NPAC Region 8 Name and Information</b> |
| FTP IP address (decimal)     |                                           |
| FTP IP address (hexadecimal) |                                           |
| FTP directory                |                                           |
| FTP file names               |                                           |
| NPAC user ID                 |                                           |
| NPAC password                |                                           |
| LSMS key set                 |                                           |

# E

## Query Server Maintenance Procedures

This appendix contains detailed, step-by-step query server procedures, as well as information about the automated system check feature, the query server error log, and how to retrieve information from the **LNP** database fields.

### E.1 Introduction

This appendix contains detailed, step-by-step query server procedures to enable you to do the following:

- [Modify the MySQL Port for Query Servers](#)
- [Check Connection Status of Directly Connected Query Servers](#)
- [Maintain the Binary Log on Query Servers](#)
- [Check MySQL Replication Status on Query Servers](#)
- [Start MySQL Replication on Query Servers](#)
- [Stop MySQL Replication on Query Servers](#)
- [Check for Running Backups](#)
- [Reload a Query Server \*\*Database\*\* from the \*\*LSMS\*\*](#)
- [Reload a Query Server \*\*Database\*\* from Another Query Server](#)
- [Clean Up After Failed or Interrupted Snapshot](#)

It also contains information about the automated system check feature, the query server error log, and how to retrieve information from the **LNP** database fields.

### E.2 LSMS Maintenance Procedures

[Figure E-1](#) illustrates a query server configuration scenario depicting how the **LSMS** might be directly connected to a query server, or indirectly connected to daisy-chained query servers. Refer to this figure when performing the maintenance procedures described in this section.

This scenario includes the following:

- One master (**LSMS**)
- One remote system
- Five query servers:
  - One directly connected slave (Query Server A)
  - One directly connected master/slave (Query Server B)
  - Two daisy-chained slaves (Daisy-chained Query Servers C and E)
  - One daisy-chained master/slave (Daisy-chained Query Server D)

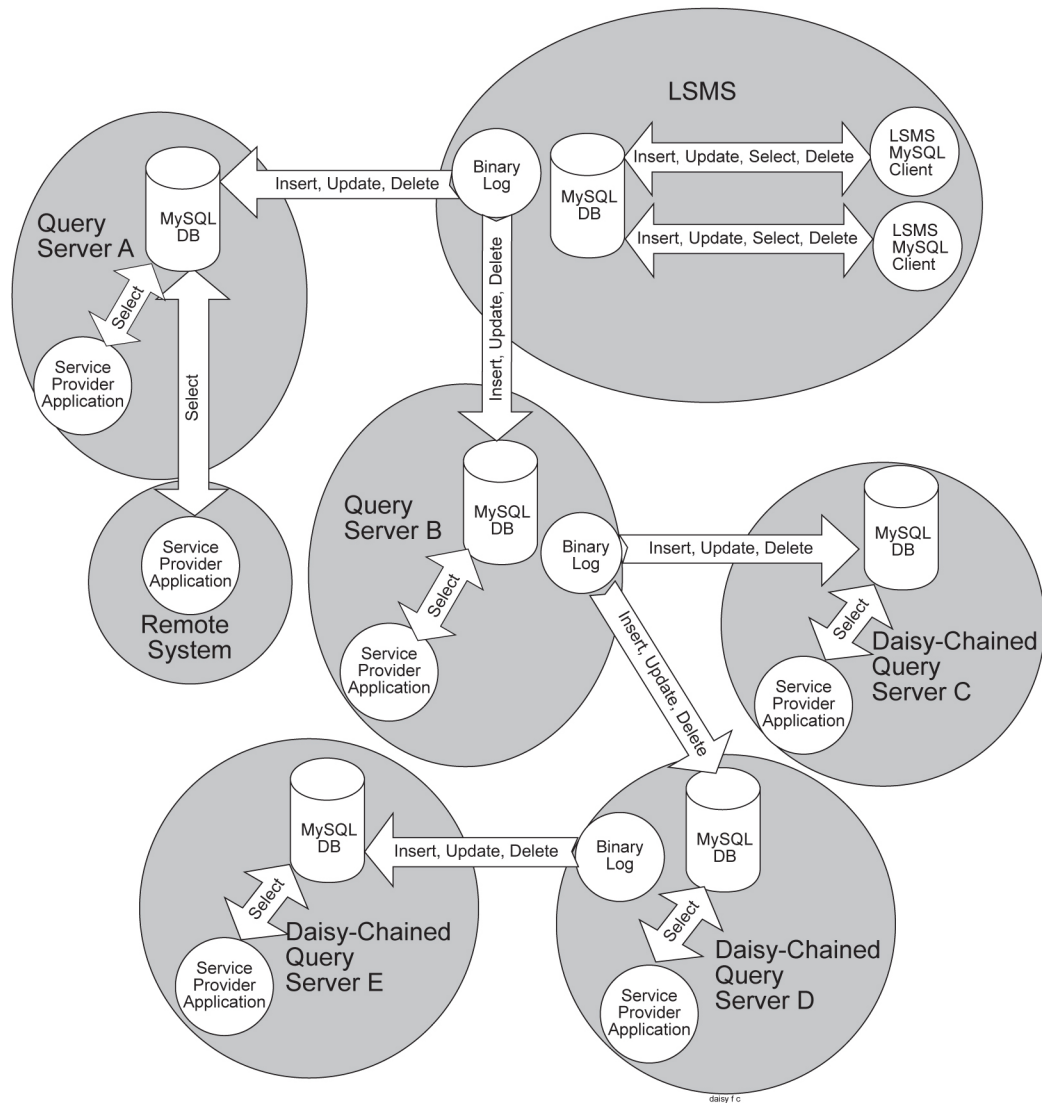
Client applications on each query server represent a Service Provider application that queries the replicated **LSMS LNP** databases using supported MySQL database **APIs**.



**Note:**

Process all updates to the query server database through the master.

**Figure E-1 Query Server Configuration Scenario**



## E.2.1 Automatic Monitoring of Query Servers

The `lsmsQueryServer` script monitors the connectivity and status of each directly connected query server to ensure that it is replicating the **LSMS LNP** database. During failure and recovery of the connection with the query servers, the **LSMS** does one or more of the following:

- Displays a notification on the graphical user interface (**GUI** notification)
- Posts a Surveillance notification at five-minute intervals to Serial Port 3 used by Surveillance

- Sends a trap to a Network Management System (**NMS**) if the optional Remote Monitoring feature is installed

For information about the notifications posted, see [8098](#) and [8099](#).



**Note:**

The **LSMS** does not monitor the connectivity or status of the daisy-chained query servers.

## E.2.2 Modify the MySQL Port for Query Servers

Since the MySQL port is a well-known port, for security purposes you can use the LSMS GUI to change the configured MySQL port for a query server.

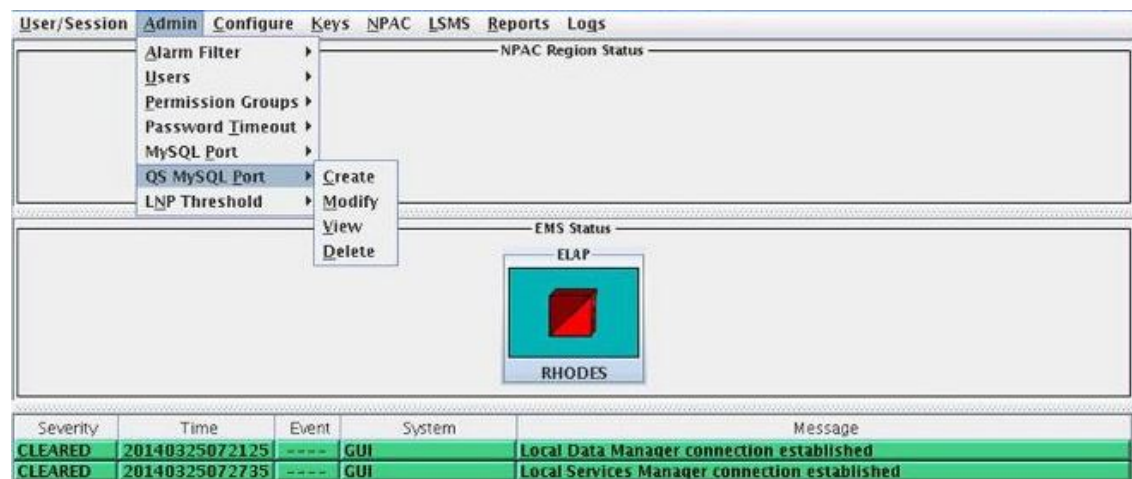


**Note:**

To avoid database replication issues, configure the same MySQL port for LSMS that you configure for the query server. For information about configuring the MySQL port for LSMS on the MySQL Port submenu, refer to the *Configuration Guide*.

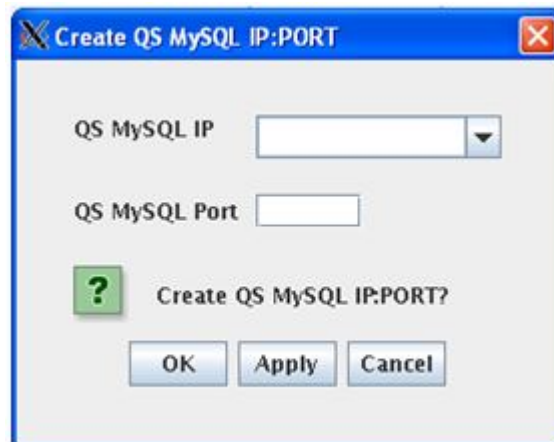
For the MySQL Port for Query Servers, there are four options under **Admin**, and then **QS MySQL Port** as shown:

**Figure E-2 Change configured QS MySQL Port**



- **Create**  
Choosing **Create** displays the Create QS MySQL IP:Port menu.

Figure E-3 Create QS MySQL IP:Port



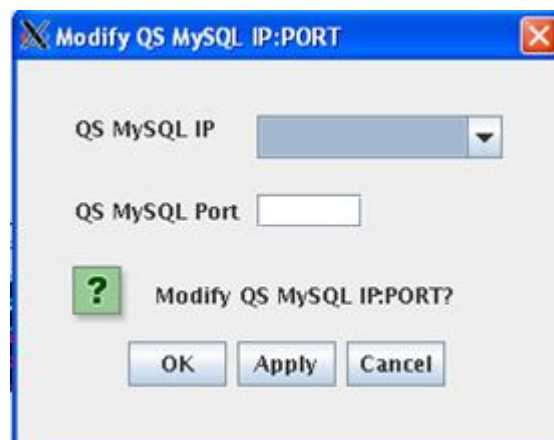
To start, all IP addresses that are configured to use default port 3306 are selectable in the **QS MySQL IP** field. Select an IP address, add the desired port in the **QS MySQL Port** field, click **OK** (or **Apply** followed by **OK**), and a `Create Successful` message is displayed.

The valid QS MySQL Port range is 1024-65535. An error message is displayed if a port outside of this range is entered.

After **Create** is used, the IP/Port combination is stored in a hidden file on LSMS, `/usr/TKLC/lmsms/tools/.qs.mysql.port`. IP addresses that are assigned to particular ports are not displayed the next time **Create** is used.

- **Modify**  
Choosing **Modify** displays the Modify QS MySQL IP:Port menu.

Figure E-4 Modify QS MySQL IP:Port



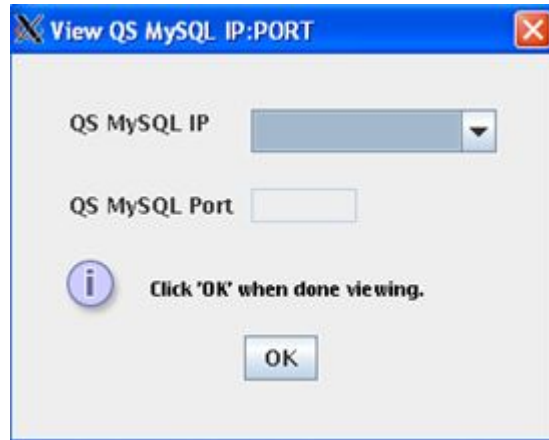
The **QS MySQL IP** field displays the IP addresses that were configured using **Create** and saved in `/usr/TKLC/lmsms/tools/.qs.mysql.port`. You can modify the port associated with an IP address, click **OK** (or **Apply** followed by **OK**), and a `Modify Successful` message is displayed.



After **Modify** is used, `/usr/TKLC/lsmstools/.qs.mysql.port` is updated with the modified IP/Port combination.

- **View**  
Choosing **View** displays the View QS MySQL IP:Port menu.

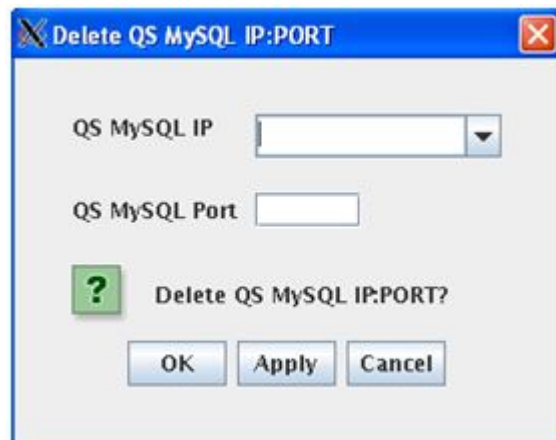
Figure E-5 View QS MySQL IP:Port



The **QS MySQL IP** field displays the IP addresses that are stored in `/usr/TKLC/lsmstools/.qs.mysql.port`, and the **QS MySQL Port** field lists the corresponding port for each IP address.

- **Delete**  
Choosing **Delete** displays the Delete QS MySQL IP:Port menu.

Figure E-6 Delete QS MySQL IP:Port



Use this option to delete an IP/Port combination from `/usr/TKLC/lsmstools/.qs.mysql.port`. Deleted IP/Port entries result in that LSMS subsequently connecting using default port 3306.

## E.2.3 Check Connection Status of Directly Connected Query Servers

You can check the connection status of query servers that are directly connected to the **LSMS**. The connection status for each query server (denoted by hostname and **IP** address) is displayed as "Connected", "Disconnected" or "Not Reachable."

To check the connection status, use the following procedure:

1. Log into the active server as the `lsmsadm` user.  
(For information about logging in, see [“Logging In to LSMS Server Command Line”](#).)

2. Enter the following command:

```
$ lsmsdb -c queryservers
```

Output similar to the following displays:

```
10.25.60.32 (10.25.60.32) Disconnected
Failed to connect to 10.25.60.12 database
```

In this example, two query servers have been configured to directly connect to the **LSMS**; the first is currently disconnected and the second failed to connect.

## E.2.4 Maintain the Binary Log on Query Servers

Use this procedure to purge the binary log of a query server platform that will have one or more daisy-chained query servers. (Perform this procedure on Query Servers B and D, as shown in [Figure E-1](#).)



### Note:

Monitor the binary log size and delete unnecessary binary log files on a weekly basis, following the steps listed below.

1. Use the following commands to identify what log each daisy-chained query server is replicating from and record your findings:

```
cd /opt/mysql/mysql/bin
mysql -u root -p
```

Enter password:

```
<daisy-chained Query Server's MySQL root user password
```

```
>mysql> SHOW SLAVE STATUS \G;
```

```
mysql> exit;
```

2. From Step 1, find the earliest log among all the daisy-chained query servers (if all the daisy-chained query servers are up-to-date, this is the last log on the list).

On the query server that has query servers daisy-chained from it, list the binary log files. The target log is the one just before the earliest one in use.

```
cd /opt/mysql/mysql/bin
```

```
mysql -u root -p
```

Enter password:

```
<Query Server's MySQL root user password>
```

```
mysql> SHOWMASTERLOGS;
```

3. Use the following command to purge the master binary log files on the query server (that has one or more query servers daisy-chained from it) excluding the target log:

```
mysql> PURGE MASTER LOGS TO '<binary_log_file>';
```

## E.2.5 Check MySQL Replication Status on Query Servers

Use the following procedure to check MySQL replication status on query servers:

1. Start the MySQL command-line utility on the slave server:

```
cd /opt/mysql/mysql/bin
```

```
mysql -u root -p
```

```
Enter password:
```

```
<Query Server's MySQL root user password>
```

2. Check the replication status using the `show slave status` command (the status of the slave server is conveyed by the `Slave_IO_Running` and `Slave_SQL_Running` column values):

```
mysql> SHOW SLAVE STATUS \G;
```

## E.2.6 Start MySQL Replication on Query Servers

Use the following procedure to start MySQL replication on the query server:

1. Start the MySQL command-line utility on the query server:

```
cd /opt/mysql/mysql/bin
```

```
mysql -u root -p
```

```
Enter password:
```

```
<Query Server's MySQL root user password>
```

2. Start MySQL replication:

When the replication operation resumes, the slave server should connect to the master and catch up on any updates that occurred since the replication operation was terminated.

```
mysql> start slave;
```

3. Verify that MySQL replication is running using the `show slave status` command (ensure the `Slave_IO_Running` and `Slave_SQL_Running` column values are set to **Yes**, and ensure that the log file has a name).

```
mysql> SHOW SLAVE STATUS \G;
```

4. Exit the MySQL command-line utility:

```
mysql> exit;
```

## E.2.7 Stop MySQL Replication on Query Servers

Use the following procedure to stop MySQL replication on the query server:

1. Start the MySQL command-line utility on the query server:

- ```
# cd /opt/mysql/mysql/bin
# mysql -u root -p
Enter password:
<Query Server's MySQL root user password>
```
2. Stop MySQL replication: (When replication is off, the slave server data is not updated and is not kept in synchronization with the master server.)

```
mysql> stop slave;
```
 3. Verify that MySQL replication is no longer running using the `show slave status` command (ensure the `Slave_IO_Running` and `Slave_SQL_Running` column values are set to **No**).

```
mysql> SHOW SLAVE STATUS \G;
```
 4. Exit the MySQL command-line utility:

```
mysql> exit;
```

E.2.8 Check for Running Backups

Both database backups and query server snapshots use the same file space on the **LSMS**. Before creating a snapshot on the **LSMS**, perform the procedure described in [“Checking for Running Backups”](#) to ensure that no database backups are running.

Caution:

If you attempt to create a snapshot while a backup is running, the backup will be interrupted, and the next time a backup is performed, it will take much longer to complete.

The following tasks also use temporary file space (as does a snapshot), so you may run out of file space if you attempt to create a snapshot after you have started but not yet finished any of these tasks:

- Starting the standby server (changing its state from **UNINITIALIZED "INHIBITED"** to **STANDBY**) using the procedure described in [“Starting a Server”](#)
- Running the `import` command
- Running the `quickaudit` command

E.2.9 Reload a Query Server Database from the LSMS

This procedure reloads a corrupted or backlevel query server's database by copying the **LSMS LNP** database. If the **LSMS** is configured with multiple query servers, reload a query server from another query server (that is currently synchronized with the **LSMS**) to prevent **NPAC**-to-network element traffic from being interrupted (see [“Reload a Query Server Database from Another Query Server”](#)).

 Note:

The following method of reloading a query server may briefly interrupt provisioning on the **LSMS** while a snapshot of the **LNP** database occurs. Therefore, choose this method only when other methods for synchronizing the query server are not feasible. The time required to accomplish this procedure depends on the bandwidth of the customer's network and the amount of data to be reloaded. To minimize service interruption, perform this procedure during a scheduled maintenance period.

1. Log into the active server as `root`.

If you are already logged into the active server as a different user, enter the following command:

```
$ su - root
```

When prompted, enter the root password.

2. Enter both of the following commands to remove all existing snapshots as well as the snapshot information file:

```
# rm /var/TKLC/lsms/free/mysql-snapshot*
# rm /var/TKLC/lsms/free/snapinfo.sql
```

3. Ensure that no database backups are in progress by performing the procedure described in ["Check for Running Backups"](#).
4. Enter the following command to create a snapshot of all the **LSMS** data.

 Caution:

Do not create a snapshot while a database backup is occurring. To ensure that a database backup is not occurring, perform the procedure described in ["Check for Running Backups"](#).

In addition, do not create a snapshot while any of the following processes are also running: backups, starting a standby node (to change its state from **UNINITIALIZED "INHIBITED"** to **STANDBY**), running the `import` command, or running the `lsmsdb quickaudit` command, all of which use temporary storage space. If you try to create a snapshot while any of these processes are running, you may not have enough disk space to complete the process.

 Note:

GNU tar (gtar) must be installed on the Query Server prior to any single region exceeding 60 million TNs.

```
# lsmsdb -c snapshot
```

The following output displays:

WARNING: This command may cause a brief interruption in traffic being sent from the NPAC to connected network elements and local LSMS provisioning

may be INTERRUPTED.
Do you want to continue? [Y/N] **Y**

5. Type **Y** and press Enter.

 Note:

This input is case-sensitive. Be sure to type a capital Y.

Output similar to the following displays (the line: in the example output below represents many lines of information that are displayed about each of the databases that is included in the snapshot).

```
Creating snapshot of the database partition, please wait...
lvcreate -- WARNING: the snapshot will be automatically disabled once it
gets full
lvcreate -- INFO: using default snapshot chunk size of 64 KB for "/dev/
vgapp/dbbackup"
lvcreate -- doing automatic backup of "vgapp"
lvcreate -- logical volume "/dev/vgapp/dbbackup" successfully created
The database is available to the application again.
Disk snapshot created successfully.
mount: block device /dev/vgapp/dbbackup is write-protected, mounting read-
only
Snapshot mounted successfully.
Created snapinfo.sql file successfully
.....
lvremove -- doing automatic backup of volume group "vgapp"
lvremove -- logical volume "/dev/vgapp/dbbackup" successfully removed
```

When the last two lines shown above (which start with `lvremove`), the snapshot is complete. However, the database is available to the application before the snapshot is complete, as indicated by the line shown in bold in the example output above. During the creation of a snapshot of the **LSMS** data, the following occurs:

- A read lock is obtained
- Table information is flushed
- A snapshot is created
- The read lock is released

 Caution:

If the snapshot fails or is interrupted, perform the procedure described in [“Clean Up After Failed or Interrupted Snapshot”](#) to clean up the file space where snapshot information is temporarily stored. If you do not clean up this file space, future snapshots will fail.

If the compressed snapshot is successfully created, the **LSMS** data is stored in the following files in the `/var/TKLC/lms/free` directory:

- mysql-snapshot-supDB.tar.gz
 - mysql-snapshot-<region>DB.tar.gz
 - snapinfo.sql
6. Use the file transfer protocol (**FTP**) to move the snapshot data of the master server into the /usr/mysql1 directory on the query server:


```
# cd /var/TKLC/lms/free
# ftp <IP address of the Query Server>

ftp> cd /usr/mysql1

ftp> bin

ftp> prompt

ftp> mput mysql-snapshot*.tar.gz snapinfo.sql

ftp> bye
```
 7. Shut down the MySQL server on the query server (if it is running):


```
# cd /opt/mysql/mysql/bin
# ./mysqladmin -u root -p shutdown

Enter password:
<Query Server's MySQL user root password>
```
 8. On the query server, extract the snapshot data from the archive tar files, /usr/mysql1/mysql-snapshot-<db>.tar.gz of the master server's data.

Make sure that the privileges on the files and directories are correct. The user that MySQL runs as needs to be able to read and write to them, just as on the master.

```
# cd /usr/mysql1

# gunzip -c mysql-snapshot-supDB.tar.gz | tar -xvf -

# rm mysql-snapshot-supDB.tar.gz
```

Now, extract the data for the snapshot files for each of the **LSMS** regions starting with the largest regions first. Replace <regionDB> with the regional database name (for example, CanadaDB, MidwestDB, and so forth). Be sure to remove the compressed snapshot files after each database is extracted to guarantee that sufficient disk space is available for all databases.

```
# gunzip -c mysql-snapshot-<regionDB>.tar.gz | tar -xvf -

# rm mysql-snapshot-<regionDB>.tar.gz
```
 9. Start the MySQL **daemon** on the query server:


```
# cd /opt/mysql/mysql/bin
# ./mysqld_safe --skip-slave-start &
```

 Note:

It is important to start the **daemon** with the --skip-slave-start option so that replication does not start automatically.

10. On the query server, start the MySQL command line utility:


```
# ./mysql -u root -p
```
11. On the query server, reset the configuration information:

```
mysql> reset slave;
mysql> reset master;
```

12. Configure the query server to start replication from the correct position on the master.

This information is stored in the `snapinfo.sql` file.

```
mysql> source /usr/mysql1/snapinfo.sql
```

13. Start replication:

```
mysql> start slave;
```

The query server should connect to the master and catch up on any updates that occurred since the snapshot was taken. When a query server has started replicating, a `master.info` file is stored in the same directory as the error log (for information about where the error log is stored, see [Query Server Error Log](#)).

Caution:

Do not remove or edit the `master.info` file. This file is used by the query server to keep track of how much of the master's binary log it has processed.

E.2.10 Reload a Query Server Database from Another Query Server

This procedure reloads a corrupted or backlevel query server's **LNP** database by copying another query server's **LNP** database. If the **LSMS** is configured with multiple query servers and at least one is currently synchronized, it is recommended to reload a query server from another query server (instead of from the **LSMS**) to prevent **NPAC**-to-network element traffic from being interrupted.

Note:

Replication on the query server may be interrupted while a snapshot of the **LNP** database occurs. The time required to accomplish this procedure depends on the bandwidth of your network and the amount of data to be reloaded.

Note:

[1](#) through [10](#) pertain to the query server that is directly connected to the **LSMS**. [11](#) through [14](#) pertain to the query server being reloaded.

1. Start the MySQL command-line utility on the query server that is directly connected to the **LSMS**:

```
# cd /opt/mysql/mysql/bin
# ./mysql -u root -p

Enter password:
<Query Server's MySQL user root password>
```

2. Stop MySQL replication: (When replication is off, the query server data is not updated and is not kept in synchronization with the **LSMS**.)

```
mysql> stop slave;
```


3. Obtain a read lock and flush table cache information:

(The flush writes changes to tables on disk. The read lock prohibits changes to be made to tables but continues to allow other threads to read from them.)

```
mysql> FLUSH TABLES WITH READ LOCK;
```

4. Display the file name and current position of the binary log:

```
mysql> SHOW MASTER STATUS;
```

Output similar to the following displays:

```
+-----+-----+-----+-----+
| File | Position | Binlog_Do_DB | Binlog_Ignore_DB |
+-----+-----+-----+-----+
| mysql-bin.003 | 73      | test          | manual,mysql      |
+-----+-----+-----+-----+
```

5. Record the values in the `File` and `Position` columns, which display the file name and current position of the binary log, respectively.

In the example above, the file name is `mysql-bin.003`, and the current position is `73`. These values are necessary to properly start the slave process on the query server that is being reloaded.

6. Exit the MySQL command-line utility:

```
mysql> exit;
```

7. Shutdown the MySQL server on the query server that is directly connected to the **LSMS**:

```
# ./mysqladmin -u root -p shutdown
Enter password:
<Query Server's MySQL root user password>
```

8. Remove all existing compressed snapshot files (if any):

```
# rm /usr/mysql1/mysql-snapshot*
```

9. Create a snapshot of the query server's copy of all the **LSMS** data.

Create a compressed snapshot file for the Supplemental database:

Note:

GNU tar (gtar) must be installed on the Query Server prior to any single region exceeding 60 million TNs.

```
# tar -cvf - /usr/mysql1/supDB/* | gzip > /usr/mysql1/mysql-
snapshot-supDB.tar.gz
```

Create compressed snapshot files for each of the regional databases. Replace `<regionDB>` with the regional database name (for example, `CanadaDB`, `MidwestDB`, and so forth).

```
# tar -cvf - /usr/mysql1/<regionDB>/* | gzip > /usr/mysql1/mysql-
snapshot-<regionDB>.tar.gz
```

10. At the query server that is directly connected to the **LSMS**, restart the MySQL **daemon**:

```
# cd /opt/mysql/mysql/bin
```

```
# ./mysqld_safe &
```

11. Shut down the MySQL server on the query server being reloaded:

```
# ./mysqladmin -u root -p shutdown
Enter password:
<Query Server's MySQL user root password>
```

12. From the master query server, use the file transfer protocol (FTP) to move the snapshot data of the master server into the /usr/mysql1 directory on the query server being reloaded:

```
# cd /usr/mysql1
# ftp <IP address of the Query Server being reloaded>

ftp> cd /usr/mysql1

ftp> bin

ftp> prompt

ftp> mput mysql-snapshot*.tar.gz

ftp> bye
```

13. On the query server being reloaded, extract the snapshot data from the archive tar file of the directly connected query server's data.

Ensure that the privileges on the files and directories are correct. The user which MySQL runs as needs to be able to read and write to them, just as on the master. Perform the following commands:

```
# cd /usr/mysql1

# gunzip -c mysql-snapshot-supDB.tar.gz | tar -xvf -

# rm mysql-snapshot-supDB.tar.gz
```

Now, extract the data for the snapshot files for each of the **LSMS** regions starting with the largest regions first. Replace <regionDB> with the regional database name (for example, CanadaDB, MidwestDB, and so forth). Be sure to remove the compressed snapshot files after each database is extracted to guarantee that sufficient disk space is available for all databases:#

```
# gunzip -c mysql-snapshot-<regionDB>.tar.gz | tar -xvf -

# rm mysql-snapshot-<regionDB>.tar.gz
```

14. Start the MySQL **daemon** on the query server being loaded.

```
# cd /opt/mysql/mysql/bin

# ./mysqld_safe --skip-slave-start
```

Note:

It is important to start the **daemon** with the --skip-slave-start option so that replication does not start automatically.

15. Start the mysql command-line utility on the query server that is being loaded:

```
# ./mysql -u root -p
```

16. Set the binary log position using information that you recorded in 5.

```
mysql> CHANGE MASTER TO
MASTER_LOG_FILE='<recorded_log_file_name>',
```

```
MASTER_LOG_POS=<recorded_log_position>;
```

For `<recorded_log_file_name>`, use the value you recorded for the file name in 5, and for `,` use the value you recorded for the binary position in 5. For example, using the values shown in the example, enter the following command to set the binary log position:

```
mysql> CHANGE MASTER TO
MASTER_LOG_FILE='mysql-bin.003',
MASTER_LOG_POS=73;
```

17. Start replication on the query server that has been loaded:

```
mysql> start slave;
```

The query server should connect to the master server (**LSMS** or another query server) and catch up on any updates that occurred since the snapshot was taken.

E.2.11 Clean Up After Failed or Interrupted Snapshot

If a snapshot fails or is interrupted, the `/dev/vgapp/dbbackup` volume will remain in the file space that is temporarily used by both backups and snapshot creation. If this volume is present when another snapshot is attempted, the new snapshot will fail.

If a snapshot fails, perform the following procedure to clean up the file space that is used for temporarily storing snapshot information. If this file space is not cleaned up, any future snapshot attempts will fail.

1. If a snapshot has failed, first ensure that no backup is already running by performing the procedure described in “[Check for Running Backups](#)”.
 - If a backup is running, **DONOT** perform this procedure. Wait until the backup is complete and retry the snapshot.
 - If a backup is not running, proceed to the next step.
2. Log into the active server as `root`.

If you are already logged into the active server as a different user, enter the following command:

```
$ su - root
```

When prompted, enter the root password.

3. Enter the following commands:

```
# /bin/umount /mnt/backup
# /usr/sbin/lvremove -f /dev/vgapp/dbbackup
```

The following output will display:

```
lvremove -- doing automatic backup of volume group "vgapp"
lvremove -- logical volume "/dev/vgapp/dbbackup" successfully removed
```

When the last line in 3 displays, you have completed this procedure.

E.3 Automated System Check

The automated system check feature (`syscheck`) detects, diagnoses, and displays a summary of the overall health of the **LSMS** server. An **LSMS** application-specific module, `qs_app` (System Class) reports on the status of query server direct connections with the

LSMS. The status of each connection is displayed on the screen as "OK", "WARNING", or "FAILURE".

Manually Checking Query Server Status

Although `syscheck` runs automatically and records output in the `syscheck` log, users can run the `syscheck` command to check query server status. To manually check query server status, perform the following procedure:

1. Log into the active server command line as `root`.
(For information about logging in, see [“Logging In to LSMS Server Command Line”](#)).

2. Enter the following command:

```
# syscheck system qs
```

The possible output examples are explained below.

Automated System Check OK Status

When `syscheck` detects no problems with query server direct connections, output similar to the following appears.

Figure E-7 Automated System Check Output Example - OK

```
Running modules in class system...
      OK

The log is available at:
-->/var/TKLC/log/syscheck/fail_log
```

Automated System Check FAILURE Status

When `syscheck` detects one or more of the following failures, output similar to the following appears.

- The **LSMSDB** tool, which is utilized to obtain connection status, does not exist.
- The **LSMSDB** tool fails to connect to the database server.
- The query server hostname is not associated with corresponding **Internet Protocol (IP)** addresses in the `/etc/hosts` file.
- The platform hosting a query server could not be pinged (Not Reachable). The hostname of the query servers that fail the `ping` check is reported.

Figure E-8 Automated System Check Output Example - FAILURE

```
Running modules in class system...
*      qs: FAILURE:: Query Server 10.26.60.136 (10.26.60.136) Not Reachable
One or more module in class "system" FAILED

Failures occurred during system check. The failure log is available at:
-->/var/TKLC/log/syscheck/fail_log
```

Automated System Check WARNING Status

When `syscheck` detects that one or more query servers are not connected and replicating the **LSMS** database, output similar to the following appears. The hostname of the query servers that fail the connections check is reported.

Figure E-9 Automated System Check Output Example - WARNING

```
Running modules in class system...
*      qs: WARNING:: Query Server 10.25.60.32 (10.25.60.32) Disconnected
                                         OK
The log is available at:
-->/var/TKLC/log/syscheck/fail_log
```

E.4 Query Server Error Log

The query server error log (see the example shown in [Figure E-10](#)) contains the following information, if applicable:

- When `mysqld` was started and stopped
- Critical errors found when running `mysqld`
- Replication errors and warnings
- Warnings if `mysqld` detects a table that needs to be automatically checked or repaired

The query server error log is assigned a name based on the name of your host and appended with a `.err` extension (for example, `<hostname>.err`) and is located in one of the following directories:

- On the **LSMS**, in `/var/TKLC/lms/db`
- On a query server, in `/usr/mysql1`. On a Windows machine, `mysqld` writes this log directly to `C:\mysql\data\mysql.err`.

Note:

Because the query server error log continuously increases in size, it is the user's responsibility to monitor it. To manually delete the log, first shut down the server. Alternatively, execute the `mysql-log-rotate` script inside your crontab.

Figure E-10 Query Server Error Log Example

```
mysqld: ready for connections

020715 14:27:38  Slave thread initialized

020715 14:28:00  Slave thread: error connecting to master: Can't connect
to MySQL server on '192.168.34.98' (183) (0), retry in 60 sec

020715 14:29:21  Slave: connected to master
'lsmsrepl@192.168.34.98:3306', replication started in log
'192.168.34.98-bin.003' at position 1763
```

E.5 Retrieving Information from LNP Database Fields

The **LNP** database is in table format. Following are the characteristics of the table rows and columns:

- Each column contains a value for each row.
- The table does not contain gaps or short columns.
- Each row is a single entity, and the columns describe the attributes of those entities.
- Each column has a name and a type, such as a string or a number. (See [Table E-1](#) through [Table E-3](#) for the **LNP** database table names and associated fields.)

To obtain information (name, type, if field contains a Null, key fields, default value, and so forth) for each field of a table on the query server, perform the following steps:

Note:

Example output follows the command syntax in [2](#) through [5](#)

1. Start the `mysql` command-line utility on the query server using the following command:

```
# cd /opt/mysql/mysql/bin
# mysql -u root -p

Enter password:
<Query Server's MySQL user root password>
```

2. List the names of the databases on the query server using the following command:

```
mysql> SHOW DATABASES;
```

```
mysql> SHOW DATABASES;
+-----+
| Database |
+-----+
| ResyncDB |
| WesternDB |
| mysql    |
| supDB    |
+-----+
4 rows in set (0.09 sec)
```

3. Select the name of the database that contains tables from which you want to retrieve information using the following command:

```
mysql> USE <database>;
where <database> is one of the following: supDB, CanadaDB, MidAtlanticDB,
MidwestDB, NortheastDB, SoutheastDB, SouthwestDB, WestCoastDB, WesternDB
```

```
mysql> USE WesternDB
Database changed
```

4. List the names of the tables in the selected database using the following command:

```
mysql> SHOW TABLES;
```

```
mysql> SHOW TABLES;
+-----+
| Tables_in_WesternDB |
+-----+
| NumberPoolBlock      |
| ServiceProvLRN       |
| ServiceProvNPA_NXX   |
| ServiceProvNPA_NXX_X |
| ServiceProvNetwork   |
| SubscriptionVersion  |
+-----+
6 rows in set (0.01 sec)
```

5. Retrieve column and field information of a database table using the following command:

```
mysql> DESCRIBE <table>;
```

where <table> is the name of the database table from the list of tables displayed in 4

```
mysql> describe SubscriptionVersion;
```

Field	Type	Null	Key	Default	Extra
versionId	int(11)	NO	PRI		
tn	char(10)	NO	UNI		
lrn	char(10)	NO	MUL		
newCurrentSp	char(4)	NO	MUL	0000	
activationTimestamp	char(14)	NO		0000000000000000	
classDPC	char(9)	NO			
classSSN	char(3)	NO			
lidxDPC	char(9)	NO			
lidxSSN	char(3)	NO			
isvmDPC	char(9)	NO			
isvmSSN	char(3)	NO			
cnamDPC	char(9)	NO			
cnamSSN	char(3)	NO			
endUserLocationValue	char(12)	NO			
endUserLocationType	char(2)	NO			
billingId	char(4)	NO			
lnpType	tinyint(3) unsigned	NO		0	
downloadReason	tinyint(3) unsigned	NO		0	
wsmcdPC	char(9)	NO			
wsmcSSN	char(3)	NO			
svType	tinyint(4)	NO		-1	
alternativeSPID	char(4)	NO			

22 rows in set (0.00 sec)

E.6 LNP Database Tables and Fields

The Query Server database consists of replicated copies of the **LSMS LNP** database tables listed in [Table E-1](#), [Table E-2](#), and [Table E-3](#).



Note:

In the table below, names of regional LNP database tables and fields may be split between lines. This does not imply a space in the name of the table or field.

Table E-1 Regional Database Tables and Fields

Regional (<Region>) DB LNP Database Tables	Fields			
SubscriptionVersion	versionID	tn	lrn	newCurrentSp
	classDPC	classSSN	lidbDPC	lidbSSN
	isvmDPC	isvmSSN	cnamDPC	cnamSSN
	wsmcDPC	wsmcSSN	LnpType	billingId
	endUserLocation Value	endUserLocation Type	activation Timestamp	downloadReason
	SVType	alternativeSPID		
NumberPoolBlock	blockId	npanxx_x	lrn	newCurrentSP
	classDPC	classSSN	lidbDPC	lidbSSN
	isvmDPC	isvmSSN	cnamDPC	cnamSSN
	wsmcDPC	wsmcSSN	activationTimestamp	downloadReason
	SVType	alternativeSPID		
ServiceProvLRN	serviceProviderId	id	lrn	creationTimeStamp
	downloadReason			
ServiceProv NPA_NXX	serviceProviderId	id	npanxx	creationTimeStamp
	effectiveTimeStamp	downloadReason		
ServiceProv NPA_NXX_X	serviceProviderId	id	npanxx_x	creationTimeStamp
	effectiveTimeStamp	modifiedTime Stamp	downloadReason	
ServiceProvNetwork	serviceProvId	serviceProvName	serviceProvType	
Where <Region> is one of the following:	Canada	MidAtlantic	Midwest	Northeast
	Southeast	Southwest	WestCoast	Western

Table E-2 Supplemental Database Tables and Fields (Part 1)

Supplemental (supDB) LNP Database Tables	Fields			
DefaultGtt	groupName	npanxx	spid	
	ain_set	ain_tt	ain_dpc	ain_ssn
	ain_xlat	ain_ri	ain_ngt	ain_rgta
	in_set	in_tt	in_dpc	in_ssn
	in_xlat	in_ri	in_ngt	in_rgta
	class_set	class_tt	class_dpc	class_ssn
	class_xlat	class_ri	class_ngt	class_rgta

Table E-2 (Cont.) Supplemental Database Tables and Fields (Part 1)

Supplemental (supDB) LNP Database Tables		Fields		
OverrideGtt	lidb_set	lidb_tt	lidb_dpc	lidb_ssn
	lidb_xlat	lidb_ri	lidb_ngt	lidb_rgta
	isvm_set	isvm_tt	isvm_dpc	isvm_ssn
	isvm_xlat	isvm_ri	isvm_ngt	isvm_rgta
	cnam_set	cnam_tt	cnam_dpc	cnam_ssn
	cnam_xlat	cnam_ri	cnam_ngt	cnam_rgta
	wsmc_set	wsmc_tt	wsmc_dpc	wsmc_ssn
	wsmc_xlat	wsmc_ri	wsmc_ngt	wsmc_rgta
	groupName	ltn	spid	
	class_set	class_tt	class_dpc	class_ssn
	class_xlat	class_ri	class_ngt	class_rgta
	lidb_set	lidb_tt	lidb_dpc	lidb_ssn
	lidb_xlat	lidb_ri	lidb_ngt	lidb_rgta
	isvm_set	isvm_tt	isvm_dpc	isvm_ssn
	isvm_xlat	isvm_ri	isvm_ngt	isvm_rgta
	cnam_set	cnam_tt	cnam_dpc	cnam_ssn
	cnam_xlat	cnam_ri	cnam_ngt	cnam_rgta
	wsmc_set	wsmc_tt	wsmc_dpc	wsmc_ssn
	wsmc_xlat	wsmc_ri	wsmc_ngt	wsmc_rgta
NpaSplit	oldNpa	newNpa	nxx	startPDP
	endPDP	region	status	
LsmsServiceProvider	spid	description	contactInfo	

Table E-3 Supplemental Database Tables and Fields (Part 2)

Supplemental (supDB) LNP Database Tables		Fields		
GttGroup	name	description		
	ain_set	ain_tt	ain_dpc	ain_ssn
	ain_xlat	ain_ri	ain_ngt	ain_rgta
	in_set	in_tt	in_dpc	in_ssn
	in_xlat	in_ri	in_ngt	in_rgta
	class_set	class_tt	class_dpc	class_ssn
	class_xlat	class_ri	class_ngt	class_rgta
	lidb_set	lidb_tt	lidb_dpc	lidb_ssn
	lidb_xlat	lidb_ri	lidb_ngt	lidb_rgta
	isvm_set	isvm_tt	isvm_dpc	isvm_ssn
	isvm_xlat	isvm_ri	isvm_ngt	isvm_rgta
	cnam_set	cnam_tt	cnam_dpc	cnam_ssn
	cnam_xlat	cnam_ri	cnam_ngt	cnam_rgta
	wsmc_set	wsmc_tt	wsmc_dpc	wsmc_ssn

Table E-3 (Cont.) Supplemental Database Tables and Fields (Part 2)

Supplemental (supDB) LNP Database Tables		Fields		
EmsInterface	wsmcsc_xlat	wsmcsc_ri	wsmcsc_ngt	wsmcsc_rgt
	cli	emsType	primaryAddress	secondaryAddress
	mateCli	pointCode	matePointCode	capabilityPoint Code
	gttGroup	tnFilter	ownerSpid	componentInfo
TnFilter	contactInfo	dcmAddress	retryInterval	retryCount
	pingMethod			
NpacRegion	spid	name	description	filterType
	regions	npanxxType	npanxxs	
	region	npacSmsName	lsmsPsel	lsmsSsel
	lsmsTsel	lsmsNsap	primaryNpacPsel	primaryNpacSsel
	primaryNpacTsel	primaryNpacNsap	primaryNpac FtpAddress	secondaryNpac Psel
	secondaryNpacSse l	secondaryNpacTse l	secondaryNpac Nsap	secondaryNpac FtpAddress
<Region>Npac Measurements	active	componentInfo	contactInfo	lastChanged Timestamp
	currentNpac			
	yyyyddhh	Binds	SuccessOps	FailedOps
<Clii>Eagle Measurements	yyyyddhh			
	updTnSuccess	updTnFail	DelTnSuccess	DelTnFail
	updDGttSuccess	updDGttFail	DelDGttSuccess	DelDGttFail
	updOGttSuccess	updOGttFail	DelOGttSuccess	DelOGttFail
	updSplitSuccess	updSplitFail	DelSplitSuccess	DelSplitFail
	Binds	LsmsRetries	NERetries	
<Region>PublicKey	id	listId	keyId	status
	exponent	modulus		
<Region>PrivateKe y	id	listId	keyId	status
	keyval			
LsmsUser	name	golden	groupName	inactivityTimeout
LsmsUserSpid	lsmsUser	spid		
Where <Region> is one of the following:	Canada	MidAtlantic	Midwest	Northeast
	Southeast	Southwest	WestCoast	Western
Where <Clii> is the Common Language Location Indicator of the EMS/EAGLE to which that LSMS is connected.				

 Note:

In [Table E-3](#), by default, the following Supplemental (SupDB) **LNPDatabase** Tables are not replicated. To replicate these tables, refer to the Note in Step 1 of the topic, “MySQL Replication Configuration for Query Servers” in Appendix A of the *Configuration Guide*.

- <Region>PublicKey
- <Region>PrivateKey
- LsmsUser
- LsmsUserSpid

To replicate these tables, refer to the Note in Step 1 of the topic, “MySQL Replication Configuration for Query Servers” in Appendix A of the *Configuration Guide*.

E.7 Query Server Database Structure

This section contains the database structure needed to develop customer-provided applications on the query servers.

```
--

-- Create NpacRegion table

--

-- One NpacRegion defines the configuration of the primary and secondary
NPAC.

--

CREATE TABLE  NpacRegion

(

    -- Region name

    region          VARCHAR(40)  NOT NULL,

    -- SMS Name defined by NPAC

    npacSmsName     TINYBLOB,

    -- OSI address of LSMS

    lsmsPsel        TINYBLOB,

    lsmsSsel        TINYBLOB,

    lsmsTsel        TINYBLOB,

    lsmsNsap        TINYBLOB,

    -- OSI address of primary NPAC
```

```

primaryNpacPsel      TINYBLOB,

primaryNpacSsel      TINYBLOB,

primaryNpacTsel      TINYBLOB,

primaryNpacNsap      TINYBLOB,


primaryNpacFtpAddress TINYBLOB,


-- OSI address of secondary NPAC

secondaryNpacPsel    TINYBLOB,

secondaryNpacSsel    TINYBLOB,

secondaryNpacTsel    TINYBLOB,

secondaryNpacNsap    TINYBLOB,


secondaryNpacFtpAddress TINYBLOB,


-- Region is active

active              BOOL          NOT NULL DEFAULT 0,


-- Component Info (stored as CSV string)

componentInfo       BLOB          NOT NULL,

-- Contact Info (stored as CSV string)

contactInfo         BLOB          NOT NULL,


-- Last changed timestamp set by npacagent

lastChangedTimestamp CHAR(14)     NOT NULL, -- Default now


-- Current npac in use set by npacagent

currentNpac         ENUM("Primary", "Secondary") DEFAULT "Primary",

```

```
-- Region name is primary key

PRIMARY KEY (region)

)

TYPE = MyIsam;

INSERT INTO NpacRegion

(region, npacSmsName,

lsmsPsel, lsmsSsel, lsmsTsel, lsmsNsap,

primaryNpacPsel, primaryNpacSsel, primaryNpacTsel, primaryNpacNsap,
primaryNpacFtpAddress,

secondaryNpacPsel, secondaryNpacSsel, secondaryNpacTsel,
secondaryNpacNsap, secondaryNpacFtpAddress,

componentInfo, contactInfo, lastChangedTimestamp)

VALUES ("Canada", "Region8 NPAC Canada",

"cw7", "cw7", "", "rk6",

"", "", "", "0x00000000",

"0.0.0.0",

"", "", "", "0x00000000",

"0.0.0.0",

'"NPAC","TKLC","LSMS","Tekelec, Inc.,"6.0","1.0"',

'"Lsms Admin","admin@tekelec.com","5200 Paramount
Parkway","Morrisville","NC","", "USA","27560","9194605500","8005551234","1
234","9195551234"',

DATE_FORMAT(NOW(), "%Y%m%d%h%i%s")),

("MidAtlantic", "Mid-Atlantic Regional NPAC SMS",

"cw1", "cw1", "", "rk6",

"", "", "", "0x00000000",

"0.0.0.0",

"", "", "", "0x00000000",
```

```

"0.0.0.0",

'NPAC","TKLC","LSMS","Tekelec, Inc.,"6.0","1.0',

'LSms Admin","admin@tekelec.com","5200 Paramount
Parkway","Morrisville","NC","","USA","27560","9194605500","8005551234","1
234","9195551234"',

DATE_FORMAT(NOW(), "%Y%m%d%h%i%s")),

("Midwest", "Midwest Regional NPAC SMS",

"cw0", "cw0", "", "rk6",

"", "", "", "0x00000000",

"0.0.0.0",

"", "", "", "0x00000000",

"0.0.0.0",

'NPAC","TKLC","LSMS","Tekelec, Inc.,"6.0","1.0',

'LSms Admin","admin@tekelec.com","5200 Paramount
Parkway","Morrisville","NC","","USA","27560","9194605500","8005551234","1
234","9195551234"',

DATE_FORMAT(NOW(), "%Y%m%d%h%i%s")),

("Northeast", "Northeast Regional NPAC SMS",

"cw2", "cw2", "", "rk6",

"", "", "", "0x00000000",

"0.0.0.0",

"", "", "", "0x00000000",

"0.0.0.0",

'NPAC","TKLC","LSMS","Tekelec, Inc.,"6.0","1.0',

'LSms Admin","admin@tekelec.com","5200 Paramount
Parkway","Morrisville","NC","","USA","27560","9194605500","8005551234","1
234","9195551234"',

DATE_FORMAT(NOW(), "%Y%m%d%h%i%s")),

("Southeast", "Southeast Regional NPAC SMS",

"cw3", "cw3", "", "rk6",

"", "", "", "0x00000000",

```

```

"0.0.0.0",

"", "", "", "0x00000000",

"0.0.0.0",

'NPAC", "TKLC", "LSMS", "Tekelec, Inc.", "6.0", "1.0"',

'LSms Admin", "admin@tekelec.com", "5200 Paramount
Parkway", "Morrisville", "NC", "", "USA", "27560", "9194605500", "8005551234", "1
234", "9195551234"',

DATE_FORMAT(NOW(), "%Y%m%d%h%i%s")),

("Southwest", "Southwest Regional NPAC SMS",

"cw4", "cw4", "", "rk6",

"", "", "", "0x00000000",

"0.0.0.0",

"", "", "", "0x00000000",

"0.0.0.0",

'NPAC", "TKLC", "LSMS", "Tekelec, Inc.", "6.0", "1.0"',

'LSms Admin", "admin@tekelec.com", "5200 Paramount
Parkway", "Morrisville", "NC", "", "USA", "27560", "9194605500", "8005551234", "1
234", "9195551234"',

DATE_FORMAT(NOW(), "%Y%m%d%h%i%s")),

("WestCoast", "WestCoast Regional NPAC SMS",

"cw6", "cw6", "", "rk6",

"", "", "", "0x00000000",

"0.0.0.0",

"", "", "", "0x00000000",

"0.0.0.0",

'NPAC", "TKLC", "LSMS", "Tekelec, Inc.", "6.0", "1.0"',

'LSms Admin", "admin@tekelec.com", "5200 Paramount
Parkway", "Morrisville", "NC", "", "USA", "27560", "9194605500", "8005551234", "1
234", "9195551234"',

DATE_FORMAT(NOW(), "%Y%m%d%h%i%s")),

("Western", "Western Regional NPAC SMS",

```

```

        "cw5", "cw5", "", "rk6",

        "", "", "", "0x00000000",

        "0.0.0.0",

        "", "", "", "0x00000000",

        "0.0.0.0",

        "NPAC", "TKLC", "LSMS", "Tekelec, Inc.", "6.0", "1.0",

        "Lsms Admin", "admin@tekelec.com", "5200 Paramount
Parkway", "Morrisville", "NC", "", "USA", "27560", "9194605500", "8005551234", "1
234", "9195551234",

        DATE_FORMAT(NOW(), "%Y%m%d%h%i%s"));

--

-- Create LsmsServiceProvider table

--

CREATE TABLE LsmsServiceProvider

(

    -- The service provider id (Primary Key)

    spid          CHAR(4)    NOT NULL,

    -- Description of the service provider

    description CHAR(80)    NOT NULL,

    -- Contact Info (stored as comma separated value string)

    contactInfo BLOB NOT NULL,

    -- Primary key is the spid

    PRIMARY KEY (spid)

)

TYPE = MyIsam;

```



```
--

-- Create LsmsUser table

--

CREATE TABLE LsmsUser

(

    -- The user name (Primary Key)

    name      CHAR(64) NOT NULL,

    -- Description of the service provider

    golden    BOOL      NOT NULL DEFAULT 0,

    -- The Assigned permission group

    groupName CHAR(4) NOT NULL,

    -- The assigned inactivity timeout

    inactivityTimeout CHAR(11) NOT NULL DEFAULT '-1',

    -- Primary key is the user name

    PRIMARY KEY (name)

)

TYPE = MyIsam;

-- Create default 'golden' users

INSERT INTO LsmsUser (name, golden)

        VALUES('lsmsadm',1), ('lsmsuser',1), ('lsmsview',1),

        ('lsmsall',1), ('lsmsuext',1);

--

-- Create GttGroup table
```

```
--  
  
CREATE TABLE  GttGroup  
  
(  
  
    -- The group name (Primary Key)  
  
    name          CHAR(64)    NOT NULL,  
  
  
    -- Description of the GttGroup  
  
    description CHAR(80)    NOT NULL,  
  
  
    -- Services in GttGroup are for storing default TT/SSN values  
  
    -- AIN Service  
  
    ain_set  BOOL    NOT NULL DEFAULT 0,  
  
    ain_tt   TINYINT UNSIGNED NOT NULL,  
  
    ain_dpc  CHAR(9) NOT NULL,  
  
    ain_ssn  CHAR(3) NOT NULL,  
  
    ain_xlat TINYINT UNSIGNED NOT NULL,  
  
    ain_ri   TINYINT UNSIGNED NOT NULL,  
  
    ain_ngt  TINYINT UNSIGNED NOT NULL,  
  
    ain_rgta BOOL    NOT NULL,  
  
    -- IN Service  
  
    in_set  BOOL    NOT NULL DEFAULT 0,  
  
    in_tt   TINYINT UNSIGNED NOT NULL,  
  
    in_dpc  CHAR(9) NOT NULL,  
  
    in_ssn  CHAR(3) NOT NULL,  
  
    in_xlat TINYINT UNSIGNED NOT NULL,  
  
    in_ri   TINYINT UNSIGNED NOT NULL,  
  
    in_ngt  TINYINT UNSIGNED NOT NULL,  
  
    in_rgta BOOL    NOT NULL,
```

```
-- CLASS Service

class_set  BOOL      NOT NULL DEFAULT 0,

class_tt   TINYINT UNSIGNED NOT NULL,

class_dpc  CHAR(9) NOT NULL,

class_ssn  CHAR(3) NOT NULL,

class_xlat TINYINT UNSIGNED NOT NULL,

class_ri   TINYINT UNSIGNED NOT NULL,

class_ngt  TINYINT UNSIGNED NOT NULL,

class_rgta BOOL      NOT NULL,

-- LIDB Service

lidb_set  BOOL      NOT NULL DEFAULT 0,

lidb_tt   TINYINT UNSIGNED NOT NULL,

lidb_dpc  CHAR(9) NOT NULL,

lidb_ssn  CHAR(3) NOT NULL,

lidb_xlat TINYINT UNSIGNED NOT NULL,

lidb_ri   TINYINT UNSIGNED NOT NULL,

lidb_ngt  TINYINT UNSIGNED NOT NULL,

lidb_rgta BOOL      NOT NULL,

-- ISVM Service

isvm_set  BOOL      NOT NULL DEFAULT 0,

isvm_tt   TINYINT UNSIGNED NOT NULL,

isvm_dpc  CHAR(9) NOT NULL,

isvm_ssn  CHAR(3) NOT NULL,

isvm_xlat TINYINT UNSIGNED NOT NULL,

isvm_ri   TINYINT UNSIGNED NOT NULL,

isvm_ngt  TINYINT UNSIGNED NOT NULL,

isvm_rgta BOOL      NOT NULL,

-- CNAM Service
```

```

        cnam_set  BOOL      NOT NULL DEFAULT 0,

        cnam_tt   TINYINT UNSIGNED NOT NULL,

        cnam_dpc  CHAR(9) NOT NULL,

        cnam_ssn  CHAR(3) NOT NULL,

        cnam_xlat TINYINT UNSIGNED NOT NULL,

        cnam_ri   TINYINT UNSIGNED NOT NULL,

        cnam_ngt  TINYINT UNSIGNED NOT NULL,

        cnam_rgta BOOL      NOT NULL,

        -- WSMSC Service

        wsmcsc_set  BOOL      NOT NULL DEFAULT 0,

        wsmcsc_tt   TINYINT UNSIGNED NOT NULL,

        wsmcsc_dpc  CHAR(9) NOT NULL,

        wsmcsc_ssn  CHAR(3) NOT NULL,

        wsmcsc_xlat TINYINT UNSIGNED NOT NULL,

        wsmcsc_ri   TINYINT UNSIGNED NOT NULL,

        wsmcsc_ngt  TINYINT UNSIGNED NOT NULL,

        wsmcsc_rgta BOOL      NOT NULL,


        -- Primary key is the group name

        PRIMARY KEY (name)

    )

    TYPE = MyIsam;


--

-- Create GttGroupSpid table

--

-- This table is used to associate a GttGroup to an authorized

-- LsmsServiceProvider. The many-many relationship between the two

```

```
-- is stored by this table a group-spid combinations.
--
CREATE TABLE  GttGroupSpid
(
    -- Group name
    gttGroup     CHAR(64) NOT NULL,

    -- Spid
    spid         char(4) NOT NULL,

    -- Force GttGroup,LsmsServiceProvider combinations to be unique
    PRIMARY KEY (gttGroup, spid),

    -- Not used by MySql but included for documentation
    FOREIGN KEY (gttGroup) REFERENCES GttGroup(groupName),
    FOREIGN KEY (spid) REFERENCES LsmsServiceProvider(spId)
)
TYPE = MyIsam;

--
-- Create LsmsUserSpid table
--
-- This table is used to associate a LsmsUser to an authorized
-- LsmsServiceProvider. The many-many relationship between the two
-- is stored by this table a group-spid combinations.
--
CREATE TABLE  LsmsUserSpid
(
```

```
-- User name

lsmsUser    CHAR(64) NOT NULL,


-- Spid

spid        CHAR(4) NOT NULL,


-- Force LsmsUser,LsmsServiceProvider combinations to be unique

PRIMARY KEY (lsmsUser, spid),


-- Not used by MySql but included for documentation

FOREIGN KEY (lsmsUser) REFERENCES LsmsUser(name),

FOREIGN KEY (spid) REFERENCES LsmsServiceProvider(spId)

)

TYPE = MyIsam;


--

-- Create DefaultGTT Table

--

CREATE TABLE  DefaultGtt

(

    -- The group this DefaultGtt belongs to

    groupName  CHAR(64) NOT NULL, -- Foreign key


    -- NPA-NXX of the DefaultGtt

    npanxx     CHAR(6) NOT NULL,


    -- The SPID that created the DefaultGtt

    spid       CHAR(4) NOT NULL,
```

```
-- AIN Service

ain_set  BOOL      NOT NULL DEFAULT 0,

ain_tt   TINYINT UNSIGNED NOT NULL,

ain_dpc  CHAR(9) NOT NULL,

ain_ssn  CHAR(3) NOT NULL,

ain_xlat TINYINT UNSIGNED NOT NULL,

ain_ri   TINYINT UNSIGNED NOT NULL,

ain_ngt  TINYINT UNSIGNED NOT NULL,

ain_rgta BOOL      NOT NULL,

-- IN Service

in_set  BOOL      NOT NULL DEFAULT 0,

in_tt   TINYINT UNSIGNED NOT NULL,

in_dpc  CHAR(9) NOT NULL,

in_ssn  CHAR(3) NOT NULL,

in_xlat TINYINT UNSIGNED NOT NULL,

in_ri   TINYINT UNSIGNED NOT NULL,

in_ngt  TINYINT UNSIGNED NOT NULL,

in_rgta BOOL      NOT NULL,

-- CLASS Service

class_set  BOOL      NOT NULL DEFAULT 0,

class_tt   TINYINT UNSIGNED NOT NULL,

class_dpc  CHAR(9) NOT NULL,

class_ssn  CHAR(3) NOT NULL,

class_xlat TINYINT UNSIGNED NOT NULL,

class_ri   TINYINT UNSIGNED NOT NULL,

class_ngt  TINYINT UNSIGNED NOT NULL,

class_rgta BOOL      NOT NULL,
```

```
-- LIDB Service

lidb_set  BOOL    NOT NULL DEFAULT 0,

lidb_tt   TINYINT UNSIGNED NOT NULL,

lidb_dpc  CHAR(9) NOT NULL,

lidb_ssn  CHAR(3) NOT NULL,

lidb_xlat TINYINT UNSIGNED NOT NULL,

lidb_ri   TINYINT UNSIGNED NOT NULL,

lidb_ngt  TINYINT UNSIGNED NOT NULL,

lidb_rgta BOOL    NOT NULL,

-- ISVM Service

isvm_set  BOOL    NOT NULL DEFAULT 0,

isvm_tt   TINYINT UNSIGNED NOT NULL,

isvm_dpc  CHAR(9) NOT NULL,

isvm_ssn  CHAR(3) NOT NULL,

isvm_xlat TINYINT UNSIGNED NOT NULL,

isvm_ri   TINYINT UNSIGNED NOT NULL,

isvm_ngt  TINYINT UNSIGNED NOT NULL,

isvm_rgta BOOL    NOT NULL,

-- CNAM Service

cnam_set  BOOL    NOT NULL DEFAULT 0,

cnam_tt   TINYINT UNSIGNED NOT NULL,

cnam_dpc  CHAR(9) NOT NULL,

cnam_ssn  CHAR(3) NOT NULL,

cnam_xlat TINYINT UNSIGNED NOT NULL,

cnam_ri   TINYINT UNSIGNED NOT NULL,

cnam_ngt  TINYINT UNSIGNED NOT NULL,

cnam_rgta BOOL    NOT NULL,

-- WSMSC Service
```



```

        wsmcsc_set  BOOL      NOT NULL DEFAULT 0,

        wsmcsc_tt   TINYINT UNSIGNED NOT NULL,

        wsmcsc_dpc  CHAR(9) NOT NULL,

        wsmcsc_ssn  CHAR(3) NOT NULL,

        wsmcsc_xlat TINYINT UNSIGNED NOT NULL,

        wsmcsc_ri   TINYINT UNSIGNED NOT NULL,

        wsmcsc_ngt  TINYINT UNSIGNED NOT NULL,

        wsmcsc_rgta BOOL      NOT NULL,

        -- DefaultGtt npanxx's are unique within each group
        PRIMARY KEY (groupName, npanxx),

        -- Not used by MySql but included for documentation
        FOREIGN KEY (groupName) REFERENCES GttGroup(name)
    )
TYPE = MyIsam;

--

-- Create OverrideGtt Table
--

CREATE TABLE OverrideGtt
(
    -- The group this OverrideGtt belongs to
    groupName CHAR(64) NOT NULL, -- Foreign key

    -- LRN of the OverrideGtt
    lrn       CHAR(10) NOT NULL,

```

```
-- The SPID that created the OverrideGtt

spid          CHAR(4)  NOT NULL,

-- CLASS Service

class_set     BOOL      NOT NULL DEFAULT 0,

class_tt      TINYINT UNSIGNED NOT NULL,

class_dpc     CHAR(9)  NOT NULL,

class_ssn     CHAR(3)  NOT NULL,

class_xlat    TINYINT UNSIGNED NOT NULL,

class_ri      TINYINT UNSIGNED NOT NULL,

class_ngt     TINYINT UNSIGNED NOT NULL,

class_rgta    BOOL      NOT NULL,

-- LIDB Service

lidb_set      BOOL      NOT NULL DEFAULT 0,

lidb_tt       TINYINT UNSIGNED NOT NULL,

lidb_dpc      CHAR(9)  NOT NULL,

lidb_ssn      CHAR(3)  NOT NULL,

lidb_xlat     TINYINT UNSIGNED NOT NULL,

lidb_ri       TINYINT UNSIGNED NOT NULL,

lidb_ngt      TINYINT UNSIGNED NOT NULL,

lidb_rgta     BOOL      NOT NULL,

-- ISVM Service

isvm_set      BOOL      NOT NULL DEFAULT 0,

isvm_tt       TINYINT UNSIGNED NOT NULL,

isvm_dpc      CHAR(9)  NOT NULL,

isvm_ssn      CHAR(3)  NOT NULL,

isvm_xlat     TINYINT UNSIGNED NOT NULL,

isvm_ri       TINYINT UNSIGNED NOT NULL,
```

```

        isvm_ngt  TINYINT UNSIGNED NOT NULL,

        isvm_rgta BOOL      NOT NULL,

        -- CNAM Service

        cnam_set  BOOL      NOT NULL DEFAULT 0,

        cnam_tt   TINYINT UNSIGNED NOT NULL,

        cnam_dpc  CHAR(9) NOT NULL,

        cnam_ssn  CHAR(3) NOT NULL,

        cnam_xlat TINYINT UNSIGNED NOT NULL,

        cnam_ri   TINYINT UNSIGNED NOT NULL,

        cnam_ngt  TINYINT UNSIGNED NOT NULL,

        cnam_rgta BOOL      NOT NULL,

        -- WSMSC Service

        wsmcsc_set  BOOL      NOT NULL DEFAULT 0,

        wsmcsc_tt   TINYINT UNSIGNED NOT NULL,

        wsmcsc_dpc  CHAR(9) NOT NULL,

        wsmcsc_ssn  CHAR(3) NOT NULL,

        wsmcsc_xlat TINYINT UNSIGNED NOT NULL,

        wsmcsc_ri   TINYINT UNSIGNED NOT NULL,

        wsmcsc_ngt  TINYINT UNSIGNED NOT NULL,

        wsmcsc_rgta BOOL      NOT NULL,

        -- OverrideGtt lrns are unique within each group

        PRIMARY KEY (groupName, lrn),

        -- Not used by MySql but included for documentation

        FOREIGN KEY (groupName) REFERENCES GttGroup(name)

    )

    TYPE = MyIsam;

```

```
--  
  
-- Create EmsInterface table. A row in the EmsInterface table can  
represent  
  
-- either a MpsInterface or a OapInterface object  
  
--  
  
CREATE TABLE EmsInterface  
(  
  
    -- The CLLI (Primary Key)  
  
    clii          CHAR(10)    NOT NULL,  
  
  
    emsType        ENUM("OAP", "MPS") NOT NULL,  
  
  
    -- The IP address of the primary interface  
  
    primaryAddress TINYBLOB    NOT NULL,  
  
  
    -- The IP address of the secondary interface  
  
    secondaryAddress TINYBLOB    NOT NULL,  
  
  
    -- The method to use to verify the presence of the MPS  
  
    pingMethod     ENUM("PING", "SSH", "NONE") NOT NULL,  
  
  
    -- The mate CLLI  
  
    mateClli       CHAR(10)    NOT NULL,  
  
  
    -- Point code  
  
    pointCode      CHAR(9)     NOT NULL,  
  
  
    -- Point code of the mate
```

```

matePointCode          CHAR(9)      NOT NULL,

-- Capability point code
capabilityPointCode CHAR(9)      NOT NULL,

-- GttGroup assigned to the EmsInterface
gttGroup                CHAR(64)    NOT NULL DEFAULT ""
                        REFERENCES GttGroup(name),

-- TnFilter assigned to the EmsInterface
tnFilter                CHAR(64)    NOT NULL DEFAULT ""
                        REFERENCES TnFilter, -- via FOREIGN KEY (ownerSpid, tnfilter)

-- ServiceProvider to which this EmsInterface is assigned
ownerSpid               CHAR(4)     NOT NULL DEFAULT ""
                        REFERENCES LsmsServiceProvider(spid),

-- Component Info (stored as CSV string)
componentInfo           BLOB        NOT NULL,

-- Contact Info (stored as CSV string)
contactInfo             BLOB        NOT NULL,

-- The last fields are only used when the row represents a
-- OAP interface. The row is used to construct both OapInterface
-- objects and MpsInterface objects which are subclasses of
EmsInterface

-- OAP dcmAddress

```

```

dcmAddress          TINYBLOB NULL DEFAULT NULL,

-- OAP retry interval

retryInterval       INTEGER  NULL DEFAULT NULL,

-- OAP retry count

retryCount          INTEGER  NULL DEFAULT NULL,

-- Primary key is the CLLI name

PRIMARY KEY (clli),

-- Not used by MySql but included for documentation

FOREIGN KEY (ownerSpid, tnFilter) REFERENCES TnFilter

)

TYPE = MyIsam;

--

-- Create TnFilter table. A row in the EmsInterface table can represent
-- either a RegionTnFilter or a NpaNxxTnFilter object
--

CREATE TABLE  TnFilter

(

-- The LsmsServiceProvider this TnFilter belongs to

spid                char(4)    NOT NULL,    -- Foreign key

-- The name of the TnFilter

name                CHAR(64)   NOT NULL,

```

```
-- Description of the TnFilter

description CHAR(80) NOT NULL,

-- The filter type (NpaNxxTnFilter or RegionalTnFilter)

filterType      ENUM("Regional", "NpaNxx") NOT NULL,

-- If RegionalTnFilter, the region to send

regions          SET("Not Used", "Canada", "MidAtlantic", "Midwest",
"Northeast",

                  "Southeast", "Southwest", "WestCoast", "Western")
NOT NULL,

-- If NpaNxxTnFilter, the filter type

npaNxxType      ENUM("Include", "Exclude") NOT NULL,

-- If NpaNxxTnFilter, the npa-nxxs to send

npaNxxs          LONGBLOB NOT NULL,

-- TnFilter names are unique within LsmsServiceProvider

PRIMARY KEY (spid, name),

-- Not used by MySql but included for documentation

FOREIGN KEY (spid) REFERENCES LsmsServiceProvider(spId)

)

TYPE = MyIsam;

--

-- Create private and public key tables
```

```
--
-- The first four fields define a base class Key in the object interface
--
--      +-- PrivateKey
-- Key <--|
--      +-- PublicKey
--
-- Each subclass and table has the key values for the key type.
--
--
--
-- Create "Model" PrivateKey table
--
CREATE TEMPORARY TABLE IF NOT EXISTS TempPrivateKey
(
    listId      INT UNSIGNED,
    keyId       INT UNSIGNED,
    status      ENUM("Expired", "Valid", "InUse"),
    keyval      BLOB -- Max length 1024
)
TYPE = MyIsam;

-- Create CanadaPrivateKey table
CREATE TABLE  CanadaPrivateKey
(
    id INT UNSIGNED NOT NULL AUTO_INCREMENT,
    PRIMARY KEY (id)
) SELECT * FROM TempPrivateKey;
```



```
-- Create NortheastPrivateKey table

CREATE TABLE  NortheastPrivateKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPrivateKey;
```

```
-- Create MidAtlanticPrivateKey table

CREATE TABLE  MidAtlanticPrivateKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPrivateKey;
```

```
-- Create MidwestPrivateKey table

CREATE TABLE  MidwestPrivateKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPrivateKey;
```

```
-- Create SoutheastPrivateKey table

CREATE TABLE  SoutheastPrivateKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPrivateKey;
```

```
-- Create SouthwestPrivateKey table

CREATE TABLE  SouthwestPrivateKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPrivateKey;


-- Create WestCoastPrivateKey table

CREATE TABLE  WestCoastPrivateKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPrivateKey;


-- Create WesternPrivateKey table

CREATE TABLE  WesternPrivateKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPrivateKey;


--

-- Create "Model" PublicKey table

--

CREATE TEMPORARY TABLE IF NOT EXISTS TempPublicKey

(

    listId      INT UNSIGNED,
```

```
        keyId      INT UNSIGNED,

        status     ENUM("Expired", "Valid", "InUse"),

        exponent   TINYBLOB, -- Max length 3

        modulus    TINYBLOB  -- Max length 256

    )

    TYPE = MyIsam;

-- Create CanadaPublicKey table

CREATE TABLE  CanadaPublicKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPublicKey;

-- Create NortheastPublicKey table

CREATE TABLE  NortheastPublicKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPublicKey;

-- Create MidAtlanticPublicKey table

CREATE TABLE  MidAtlanticPublicKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPublicKey;
```

```
-- Create MidwestPublicKey table

CREATE TABLE  MidwestPublicKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPublicKey;


-- Create SoutheastPublicKey table

CREATE TABLE  SoutheastPublicKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPublicKey;


-- Create SouthwestPublicKey table

CREATE TABLE  SouthwestPublicKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPublicKey;


-- Create WestCoastPublicKey table

CREATE TABLE  WestCoastPublicKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPublicKey;
```

```
-- Create WesternPublicKey table

CREATE TABLE  WesternPublicKey

(

    id INT UNSIGNED NOT NULL AUTO_INCREMENT,

    PRIMARY KEY (id)

) SELECT * FROM TempPublicKey;


--

-- Create one measurements table for each region

--

-- Create "Model" NpacMeasurements table

CREATE TEMPORARY TABLE IF NOT EXISTS TempNpacMeasurements

(

    yyyyddhh    INT UNSIGNED NOT NULL,

    Binds        INT UNSIGNED NOT NULL DEFAULT 0,

    SuccessOps   INT UNSIGNED NOT NULL DEFAULT 0,

    FailedOps    INT UNSIGNED NOT NULL DEFAULT 0,

    PRIMARY KEY (yyyyddhh)

)

TYPE = MyIsam;


-- Create CanadaNpacMeasurements table

CREATE TABLE  CanadaNpacMeasurements

(

    PRIMARY KEY (yyyyddhh)

) SELECT * FROM TempNpacMeasurements;
```

```
-- Create NortheastNpacMeasurements table

CREATE TABLE  NortheastNpacMeasurements

(

    PRIMARY KEY (yyyydddhh)

) SELECT * FROM TempNpacMeasurements;


-- Create MidAtlanticNpacMeasurements table

CREATE TABLE  MidAtlanticNpacMeasurements

(

    PRIMARY KEY (yyyydddhh)

) SELECT * FROM TempNpacMeasurements;


-- Create MidwestNpacMeasurements table

CREATE TABLE  MidwestNpacMeasurements

(

    PRIMARY KEY (yyyydddhh)

) SELECT * FROM TempNpacMeasurements;


-- Create SoutheastNpacMeasurements table

CREATE TABLE  SoutheastNpacMeasurements

(

    PRIMARY KEY (yyyydddhh)

) SELECT * FROM TempNpacMeasurements;


-- Create SouthwestNpacMeasurements table

CREATE TABLE  SouthwestNpacMeasurements

(

    PRIMARY KEY (yyyydddhh)
```

```

) SELECT * FROM TempNpacMeasurements;

-- Create WestCoastNpacMeasurements table

CREATE TABLE  WestCoastNpacMeasurements

(

    PRIMARY KEY (yyyydddh)

) SELECT * FROM TempNpacMeasurements;

-- Create WesternNpacMeasurements table

CREATE TABLE  WesternNpacMeasurements

(

    PRIMARY KEY (yyyydddh)

) SELECT * FROM TempNpacMeasurements;

--

-- Create DbConfig table

--

CREATE TABLE  DbConfig

(

    keyType      ENUM("Canada", "MidAtlantic", "Midwest", "Northeast",

                     "Southeast", "Southwest", "WestCoast", "Western",

                     "R9", "R10", "R11", "R12", "R13", "R14",

                     "R15", "R16", "R17", "R18", "R19", "R20", -- Future
Regions

                     "Internal", "Ebda", "Lsms") NOT NULL,

    keyName      TINYBLOB NOT NULL,           -- Max length 256

    description  TINYBLOB NOT NULL DEFAULT "", -- Max length 256

    value        BLOB NOT NULL DEFAULT "",    -- Max length 64K

```

```
-- keyName is unique within keyType

PRIMARY KEY (keyType, keyName(255))

)

TYPE = MyIsam;

INSERT INTO DbConfig (keyType, keyName, description, value)

VALUES

("Canada", "REQUEST_RETRY_NUMBER", "Retry times for NPAC
requests", "3"),

("Canada", "REQUEST_RETRY_INTERVAL", "Retry minutes for NPAC
requests", "2"),

("Canada", "RECOV_RETRY_NUMBER", "Retry times for NPAC
recovery requests", "3"),

("Canada", "RECOV_RETRY_INTERVAL", "Retry mintues for NPAC
recovery requests", "5"),

("MidAtlantic", "REQUEST_RETRY_NUMBER", "Retry times for NPAC
requests", "3"),

("MidAtlantic", "REQUEST_RETRY_INTERVAL", "Retry minutes for NPAC
requests", "2"),

("MidAtlantic", "RECOV_RETRY_NUMBER", "Retry times for NPAC
recovery requests", "3"),

("MidAtlantic", "RECOV_RETRY_INTERVAL", "Retry mintues for NPAC
recovery requests", "5"),

("Midwest", "REQUEST_RETRY_NUMBER", "Retry times for NPAC
requests", "3"),

("Midwest", "REQUEST_RETRY_INTERVAL", "Retry minutes for NPAC
requests", "2"),

("Midwest", "RECOV_RETRY_NUMBER", "Retry times for NPAC
recovery requests", "3"),

("Midwest", "RECOV_RETRY_INTERVAL", "Retry mintues for NPAC
recovery requests", "5"),

("Northeast", "REQUEST_RETRY_NUMBER", "Retry times for NPAC
requests", "3"),

("Northeast", "REQUEST_RETRY_INTERVAL", "Retry minutes for NPAC
requests", "2"),
```



```

        ("Northeast", "RECOV_RETRY_NUMBER", "Retry times for NPAC
recovery requests", "3"),

        ("Northeast", "RECOV_RETRY_INTERVAL", "Retry mintues for NPAC
recovery requests", "5"),

        ("Southeast", "REQUEST_RETRY_NUMBER", "Retry times for NPAC
requests", "3"),

        ("Southeast", "REQUEST_RETRY_INTERVAL", "Retry minutes for NPAC
requests", "2"),

        ("Southeast", "RECOV_RETRY_NUMBER", "Retry times for NPAC
recovery requests", "3"),

        ("Southeast", "RECOV_RETRY_INTERVAL", "Retry mintues for NPAC
recovery requests", "5"),

        ("Southwest", "REQUEST_RETRY_NUMBER", "Retry times for NPAC
requests", "3"),

        ("Southwest", "REQUEST_RETRY_INTERVAL", "Retry minutes for NPAC
requests", "2"),

        ("Southwest", "RECOV_RETRY_NUMBER", "Retry times for NPAC
recovery requests", "3"),

        ("Southwest", "RECOV_RETRY_INTERVAL", "Retry mintues for NPAC
recovery requests", "5"),

        ("WestCoast", "REQUEST_RETRY_NUMBER", "Retry times for NPAC
requests", "3"),

        ("WestCoast", "REQUEST_RETRY_INTERVAL", "Retry minutes for NPAC
requests", "2"),

        ("WestCoast", "RECOV_RETRY_NUMBER", "Retry times for NPAC
recovery requests", "3"),

        ("WestCoast", "RECOV_RETRY_INTERVAL", "Retry mintues for NPAC
recovery requests", "5"),

        ("Western", "REQUEST_RETRY_NUMBER", "Retry times for NPAC
requests", "3"),

        ("Western", "REQUEST_RETRY_INTERVAL", "Retry minutes for NPAC
requests", "2"),

        ("Western", "RECOV_RETRY_NUMBER", "Retry times for NPAC
recovery requests", "3"),

        ("Western", "RECOV_RETRY_INTERVAL", "Retry mintues for NPAC
recovery requests", "5"),

```

```

        ("Internal", "MAX_SPIDS",      "Maximum Service Providers
allowed.",
"32"),

        ("Internal", "EDR",            "Enable Efficient Data Representation
(EDR).",      "N" ),

        ("Internal", "SNMP",           "Enable SNMP
Agent.",
"N" ),

        ("Internal", "AFT",            "Enable Automatic File
Transfer.",
"N" ),

        ("Internal", "WSMSC",          "Enable wireless service
feature.",
"N" ),

        ("Internal", "WSMSC_TO_EAGLE", "Enable sending of WMSA service to
Eagle.",      "N" ),
        ("Internal", "IP_GUI",         "Enable Web based ip
gui.",        "N" ),
        ("Internal", "SPID_SECURITY",  "Enable SPID based
security.",
"N" ),

        ("Internal", "MAX_USERS",      "Maximum Number of
Users",
"8" ),

        ("Internal", "ENHANCED_FILTERS", "Enable Group and Regional filter
creation.",   "N" ),

        ("Internal", "MAX_EAGLES",     "Maximum number of
eagles.",
"16"),

        ("Internal", "REPORT_GEN",      "Enable report
generator.",
"N" ),

        ("Internal", "REPORT_GEN_QUERY_ACTIVE", "Report generator pid
field",
"0" ),

        ("Internal", "QUERY_SERVER",   "Enable Query Server
feature",
"N" ),

        ("Internal", "INACTIVITY_TIMEOUT", "Gui and Shell inactivity timeout
feature",    "N" ),

        ("Internal", "SYSTEM_INACTIVITY_TIMEOUT", "System wide GUI and Shell
inactivity timeout value", "15" ),

```

```

("Ebda", "CMD_ARGS", "EBDA command line arguments", ""),

("Lsms", "NPAC_SPID", "Spid used to connect to NPAC", ""),

("Lsms", "CONTACT_INFO", "Spid used to connect to NPAC", '"Lsms
Admin","admin@tekelec.com","5200 Paramount
Parkway","Morrisville","NC","","USA","27560","9194605500","8005551234","1
234","9195551234"'),

("Lsms", "COMPONENT_INFO", "Spid used to connect to NPAC",
'"LSMS","TKLC","LSMS","Tekelec, Inc.,"6.0","1.0"');

--

-- Create NpaSplit table

--

CREATE TABLE NpaSplit

(

    -- The old npa

    oldNpa          char(3)      NOT NULL,

    -- The new npa

    newNpa          CHAR(3)      NOT NULL,

    -- The nxx

    nxx             CHAR(3)      NOT NULL,

    -- The start of the permissive dialing period

    startPDP        CHAR(8)      NOT NULL,

    -- The end of the permissive dialing period

    endPDP          CHAR(8)      NOT NULL,

```

```
-- The region the split belongs to

region      ENUM("Canada", "MidAtlantic", "Midwest", "Northeast",
                "Southeast", "Southwest", "WestCoast", "Western",
                "R9", "R10", "R11", "R12", "R13", "R14",
                "R15", "R16", "R17", "R18", "R19", "R20"), -- Future
Regions

-- The status of the npa split

status      ENUM("NotSet", "Pending", "Active", "Error"),

-- Old npa, new npa and nxx form primary unique key

PRIMARY KEY (oldnpa, newnpa, nxx)

)

TYPE = MyIsam;

--
-- Create SubscriptionVersion table
--
-- The Fields are defined in the order and format that are defined by the
-- NPAC bulk data file. This allows the SQL LOAD DATA command to be used
-- to load tables which is extremely fast.
--
-- Revision History
-- 15-may-07  ARICENT  Feature 110663: NANC 399
--
CREATE TABLE SubscriptionVersion
(
  -- Required field (Primary key)
  versionId      INT              NOT NULL,

  -- Required field (10 numeric character unique key)
  tn             CHAR(10)         NOT NULL,

  -- Optional field (10 numeric characters, Empty string means not present)
  lrn            CHAR(10)         NOT NULL DEFAULT "",

  -- Required field (1-4 characters)
  newCurrentSp   CHAR(4)          NOT NULL DEFAULT "0000",
```

```
-- Required field (14 characters "YYYYMMDDHHMMSS")
activationTimestamp CHAR(14) NOT NULL DEFAULT "00000000000000",

-- Optional field (9 characters, Empty string means not present)
classDPC CHAR(9) NOT NULL DEFAULT "",

-- Optional field (1-3 characters, Empty string means not present)
classSSN CHAR(3) NOT NULL DEFAULT "",

-- Optional field (9 characters, Empty string means not present)
lidbDPC CHAR(9) NOT NULL DEFAULT "",

-- Optional field (1-3 characters, Empty string means not present)
lidbSSN CHAR(3) NOT NULL DEFAULT "",

-- Optional field (9 characters, Empty string means not present)
isvmDPC CHAR(9) NOT NULL DEFAULT "",

-- Optional field (1-3 characters, Empty string means not present)
isvmSSN CHAR(3) NOT NULL DEFAULT "",

-- Optional field (9 characters, Empty string means not present)
cnamDPC CHAR(9) NOT NULL DEFAULT "",

-- Optional field (1-3 characters, Empty string means not present)
cnamSSN CHAR(3) NOT NULL DEFAULT "",

-- Optional field (1-12 numeric characters, Empty string means not
present)
endUserLocationValue CHAR(12) NOT NULL DEFAULT "",

-- Optional field (2 numeric characters, Empty string means not present)
endUserLocationType CHAR(2) NOT NULL DEFAULT "",

-- Required field (1-4 characters, Empty string means not present)
billingId CHAR(4) NOT NULL DEFAULT "",

-- Required field (lssp(0), lisp(1), pool(2))
lnpType TINYINT UNSIGNED NOT NULL DEFAULT 0,

-- Required field (new(0), delete(1), modified(2), audit-discrepancy(3)
downloadReason TINYINT UNSIGNED NOT NULL DEFAULT 0,

-- Optional field (9 characters, Empty string means not present)
wsmscDPC CHAR(9) NOT NULL DEFAULT "",

-- Optional field (1-3 characters, Empty string means not present)
wsmscSSN CHAR(3) NOT NULL DEFAULT "",

-- Optional field (wireline(0), wireless(1), voIP(2), voWiFi(3),
sv_type_4(4), sv_type_5(5), sv_type_6(6) )
svType TINYINT NOT NULL DEFAULT -1,

-- Optional field (1-4 CHARACTERS)
alternativeSPIDCHAR(4) NOT NULL DEFAULT "",
```

```
-- Primary key is the Npac SubscriptionVersion id
PRIMARY KEY (versionId),

-- TN must be indexed and unique
UNIQUE KEY tn (tn),

-- Index lrn, for LSMS Subscription Version by LRN reports
INDEX (lrn),

-- Index lrn, for LSMS Subscription Version by SPID reports
INDEX (newCurrentSp)

)
TYPE = MyIsam;

--
-- Create NumberPoolBlock table
--
-- The Fields are defined in the order and format that are defined by the
-- NPAC bulk data file. This allows the SQL LOAD DATA command to be used
-- to load tables which is extremely fast.
--
CREATE TABLE NumberPoolBlock
(
  -- Required field (Primary key)
  blockId          INT          NOT NULL,

  -- Required field (7 numeric characters, Unique key)
  npanxx_x         CHAR(7)      NOT NULL,

  -- Optional field (10 numeric characters, Empty string means not present)
  lrn              CHAR(10)     NOT NULL DEFAULT "",

  -- Required field (1-4 characters)
  newCurrentSp     CHAR(4)      NOT NULL DEFAULT "0000",

  -- Required field (14 characters "YYYYMMDDHHMMSS")
  activationTimestamp CHAR(14)  NOT NULL DEFAULT "00000000000000",

  -- Optional field (9 characters, Empty string means not present)
  classDPC         CHAR(9)      NOT NULL DEFAULT "",
  -- Optional field (1-3 characters, Empty string means not present)
  classSSN         CHAR(3)      NOT NULL DEFAULT "",

  -- Optional field (9 characters, Empty string means not present)
  lidbDPC          CHAR(9)      NOT NULL DEFAULT "",
  -- Optional field (1-3 characters, Empty string means not present)
  lidbSSN          CHAR(3)      NOT NULL DEFAULT "",

  -- Optional field (9 characters, Empty string means not present)
  isvmDPC          CHAR(9)      NOT NULL DEFAULT "",
  -- Optional field (1-3 characters, Empty string means not present)
  isvmSSN          CHAR(3)      NOT NULL DEFAULT "",

  -- Optional field (9 characters, Empty string means not present)
```

```

        cnamDPC          CHAR(9)          NOT NULL DEFAULT "",
        -- Optional field (1-3 characters, Empty string means not present)
        cnamSSN          CHAR(3)          NOT NULL DEFAULT "",

        -- Optional field (9 characters, Empty string means not present)
        wsmcDPC          CHAR(9)          NOT NULL DEFAULT "",
        -- Optional field (1-3 characters, Empty string means not present)
        wsmcSSN          CHAR(3)          NOT NULL DEFAULT "",

        -- Required field (new(0), delete(1), modified(2), audit-descrepancy(3)
        -- Changed DEFAULT from "" to 0 when migrated MySQL from 4.1.11 to 5.0.37
        downloadReason   TINYINT UNSIGNED NOT NULL DEFAULT 0,

        -- Optional field (wireline(0), wireless(1), voIP(2), voWiFi(3),
        sv_type_4(4), sv_type_5(5), sv_type_6(6) )
        svType TINYINT NOT NULL DEFAULT -1,

        -- Optional field (1-4 CHARACTERS)
        alternativeSPID   CHAR(4)          NOT NULL DEFAULT "",

        -- Primay key is the Npac NumberPoolBlock id
        PRIMARY KEY (blockId),

        -- TN must be indexed and unique
        UNIQUE KEY npanxx_x (npanxx_x),

        -- Index lrn, for LSMS Number Pool Block by LRN reports
        INDEX (lrn),

        -- Index lrn, for LSMS Number Pool Block by SPID reports
        INDEX (newCurrentSp)
    )
    TYPE = MyIsam;

--
-- Create ServiceProvNetwork table
--
-- The Fields are defined in the order and format that are defined by the
-- NPAC bulk data file
--
CREATE TABLE ServiceProvNetwork
(
    -- Required field (Primary key)
    serviceProvId   CHAR(4)          NOT NULL,

    -- Required field (1 - 40 characters)
    serviceProvName CHAR(40)          NOT NULL DEFAULT "",

    -- Service Provider type
    serviceProvType ENUM("wireline", "wireless", "non_carrier", "sp_type_3",
        "sp_type_4", "sp_type_5") NULL DEFAULT NULL,

    -- Primary key is the Service Provider ID
    PRIMARY KEY (serviceProvId)
)
    TYPE = MyIsam;

```

```
--
-- Create ServiceProvLRN table
--
-- The Fields are defined in the order that are defined by the
-- NPAC bulk data file
--
CREATE TABLE ServiceProvLRN
(
    -- Foreign key -> ServiceProvNetwork
    serviceProvId    CHAR(4)    NOT NULL,

    -- Required field (Primary key within each ServiceProvNetwork)
    id               INT        NOT NULL,

    -- Required field (10 numeric characters)
    lrn              CHAR(10)   NOT NULL,

    -- Required field (14 characters "YYYYMMDDHHMMSS")
    creationTimeStamp CHAR(14)  NOT NULL DEFAULT "00000000000000",

    -- Required field (new(0), delete(1), modified(2), audit-discrepancy(3)
    downloadReason    TINYINT   NOT NULL DEFAULT 0,

    -- Primary key is the Npac id within each ServiceProvNetwork
    PRIMARY KEY (serviceProvId, id),

    -- Lrn is unique key within each ServiceProvNetwork
    UNIQUE KEY lrn (serviceProvId, lrn),

    -- Index lrn
    INDEX (lrn),

    -- Not used by MySql but included for documentation
    FOREIGN KEY (serviceProvId) REFERENCES ServiceProvNetwork(serviceProvId)
)
TYPE = MyIsam;

--
-- Create ServiceProvNPA_NXX table
--
-- The Fields are defined in the order defined by the NPAC bulk data file
-- but the npac file formats the npanxx as 'npa-nxx'.
--
CREATE TABLE ServiceProvNPA_NXX
(
    -- Foreign key -> ServiceProvNetwork
    serviceProvId    CHAR(4)    NOT NULL,

    -- Required field (Primary Unique Key)
    id               INT        NOT NULL,

    -- Required field (6 numeric characters)
    npanxx           CHAR(6)    NOT NULL,

    -- Required field (14 characters "YYYYMMDDHHMMSS")

```



```

creationTimeStamp CHAR(14) NOT NULL DEFAULT "00000000000000",

-- Required field (14 characters "YYYYMMDDHHMMSS")
effectiveTimeStamp CHAR(14) NOT NULL DEFAULT "00000000000000",

-- Required field (new(0), delete(1), modified(2), audit-descrepancy(3)
downloadReason TINYINT NOT NULL DEFAULT 0,

-- Primary key is the Npac id within each ServiceProvNetwork
PRIMARY KEY (serviceProvId, id),

-- NpaNxx is unique key within each ServiceProvNetwork
UNIQUE KEY npanxx (serviceProvId, npanxx),

-- Index npanxx
INDEX (npanxx),

-- Not used by MySql but included for documentation
FOREIGN KEY (serviceProvId) REFERENCES ServiceProvNetwork(serviceProvId)
)
TYPE = MyIsam;

--
-- Create ServiceProvNPA_NXX_X table
--
-- The Fields are defined in the order defined by the NPAC bulk data file
-- but the npac file formats the npanxx as 'npa-nxx-x'.
--
CREATE TABLE ServiceProvNPA_NXX_X
(
  -- Foreign key -> ServiceProvNetwork
  serviceProvId CHAR(4) NOT NULL,

  -- Required field (Primary Unique Key)
  id INT NOT NULL,

  -- Required field (7 numeric characters)
  npanxx_x CHAR(7) NOT NULL,

  -- Required field (14 characters "YYYYMMDDHHMMSS")
  creationTimeStamp CHAR(14) NOT NULL DEFAULT "00000000000000",

  -- Required field (14 characters "YYYYMMDDHHMMSS")
  effectiveTimeStamp CHAR(14) NOT NULL DEFAULT "00000000000000",

  -- Required field (14 characters "YYYYMMDDHHMMSS")
  modifiedTimeStamp CHAR(14) NOT NULL DEFAULT "00000000000000",

  -- Required field (new(0), delete(1), modified(2), audit-descrepancy(3)
  downloadReason TINYINT NOT NULL DEFAULT 0,

  -- Primary key is the Npac id within each ServiceProvNetwork
  PRIMARY KEY (serviceProvId, id),

  -- NpaNxx is unique key within each ServiceProvNetwork

```

```

        UNIQUE KEY npanxx_x (serviceProvId, npanxx_x),

        -- Index npanxx_x
        INDEX (npanxx_x),

        -- Not used by MySql but included for documentation
        FOREIGN KEY (serviceProvId) REFERENCES ServiceProvNetwork(serviceProvId)
    )
    TYPE = MyIsam;

```

```

-- Create Eagle Measurements Table

```

```

-- $S is replaced by CLLI for EMS in Table Name (ie,
STPAEagleMeasurments)

```

```

CREATE TABLE $SEagleMeasurements (

        yyyyddhh      INT UNSIGNED NOT NULL,

        UpdTnSuccess   INT UNSIGNED NOT NULL DEFAULT 0,

        UpdTnFail      INT UNSIGNED NOT NULL DEFAULT 0,

        DelTnSuccess   INT UNSIGNED NOT NULL DEFAULT 0,

        DelTnFail      INT UNSIGNED NOT NULL DEFAULT 0,


        UpdDGttSuccess INT UNSIGNED NOT NULL DEFAULT 0,

        UpdDGttFail    INT UNSIGNED NOT NULL DEFAULT 0,

        DelDGttSuccess INT UNSIGNED NOT NULL DEFAULT 0,

        DelDGttFail    INT UNSIGNED NOT NULL DEFAULT 0,


        UpdOGttSuccess INT UNSIGNED NOT NULL DEFAULT 0,

        UpdOGttFail    INT UNSIGNED NOT NULL DEFAULT 0,

        DelOGttSuccess INT UNSIGNED NOT NULL DEFAULT 0,

        DelOGttFail    INT UNSIGNED NOT NULL DEFAULT 0,


        UpdSplitSuccess INT UNSIGNED NOT NULL DEFAULT 0,

```

```

        UpdSplitFail      INT UNSIGNED NOT NULL DEFAULT 0,

        DelSplitSuccess  INT UNSIGNED NOT NULL DEFAULT 0,

        DelSplitFail     INT UNSIGNED NOT NULL DEFAULT 0,

        Binds             INT UNSIGNED NOT NULL DEFAULT 0,

        LsmsRetries       INT UNSIGNED NOT NULL DEFAULT 0,

        NERetries         INT UNSIGNED NOT NULL DEFAULT 0,


        PRIMARY KEY (yyyydddhh)

    )

    TYPE = MyIsam;"
```

F

Resolution Of Known Customer Issues

Issue: `startNode` Command gets stuck in ACTIVE -> TO-ACTIVE state

Description: It has been observed in LSMS that during `startNode` on active server, sometimes even after Node is started, the server gets stuck in ACTIVE -> TO_ACTIVE state as shown below:

```
$hastatus  
ACTIVE "lsmspri->TO_ACTIVE"
```

Solution:

Remove the file `/usr/TKLC/plat/etc/HA/state.d/.haTransitionInProgress_lsmspri` if issue is observed on primary server or `/usr/TKLC/plat/etc/HA/state.d/.haTransitionInProgress_lsmssec` if issue is observed on secondary server using command as mentioned below:

```
$ rm /usr/TKLC/plat/etc/HA/state.d/.haTransitionInProgress_lsmspri
```

Issue: The following alarm is observed:

```
FALARM LOG << 20240923090347 >> [4008:LSMS] DB Proc Mon Err - HA STATE IS  
UNINITIALIZED!
```

Description: Alarm gets cleared automatically. The issue is observed as `hastatus` command sometimes reports status as UNINITIALIZED, which is not the correct status. However, during the next run, the status is reported correctly and the alarm is cleared.

Solution: If `hastatus` is observed as UNINITIALIZED on running server, re-run the command if this is observed.