Oracle® Communications LSMS Query Server

Installation and Upgrade Guide

Release 13.0

E54201-01, Revision A

May 2014

ORACLE®

Oracle Communications LSMS Query Server Installation and Upgrade Guide, Release 13.0

Contact Oracle's Tekelec Customer Care Center and inform them of your upgrade plans prior to beginning this or any upgrade procedure.

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1. INTRODUCTION

1.1 Purpose and Scope

This document contains detailed procedures for installing/upgrading the Query Server application on a Solaris 10 system.

The audience for this document is Oracle customers and the following Eagle GPS groups:

Manufacturing,

Product Verification,

Documentation,

Customer Service including Software Operations and New Product Engineering,

Application developers.

This document provides step-by-step instructions to install or upgrade the regular and ResyncDB Query Server. See FRS [4] for detailed feature and functional description of ResyncDB Query Server.

1.2 Product Summary

The ResyncDB Query Server replicates only the ResyncDB and the regular Query Server replicates all databases except the ResyncDB.

Refer to [5], Appendix A, for details.

1.3 References

Internal (Oracle)

The following are references internal to Oracle. They are provided here to capture the source material used to create this document. Internal references are only available to Oracle personnel.

[1] *TEKELEC Acronym Guide*, MS005077, Current Version, Oracle.

[2] *Software Upgrade Procedure Template*, TM005074, Current Version, Oracle.

[3] *Meeting Minutes Template*, TM000004.TXT, Current Version, Oracle.

[4] *Custom LSMS Interface Rearchitecture FRS*, FE005132, revision 1.1, Current Version, Oracle.

[5] *LSMS Configuration Guide*, E52608-01, Current Version, Oracle.

[6] *LSMS 13.0 Alarms and Maintenance Guide*, E52612-01, Current Version, Oracle.

1.4 Acronyms

E5-APP-B	Eagle5 Application Card class B cpu/board
ELAP	Eagle LNP Application Processor
CLI	Custom LSMS Interface
GB	Gigabyte
LSMS	Local Service Management System
NPB	Number Pool Block
QS	Query Server
SPARC	Scalable Processor Architecture
SPID	Service Provider ID
SV	SubscriptionVersion
TN	Telephone Number

Table 1: Acronyms

Refer to [1] for additional acronyms.

1.5 Guidelines

Steps in the written procedures begin with the name or type of server to which the step applies. Also of note is the shading of the step number box. If a box is not shaded at all, this signifies a step that needs to be performed but does not require a specific command be entered at the E5-APP-B; this is shown in Figure 1. If a box is shaded completely black, this signifies there is a specific command to be entered; this is shown in Figure 2. For example:

Each step has a checkbox for every command within the step that the technician should check to keep track of the progress of the procedure.

The title box describes the operations to be performed during that step.

Each command that the technician is to enter is in **`10 point bold Courier`** *font.*

1 ☐	Verify all materials required are present	Materials are listed in Material List (Section 3.1)

Figure 1. Example of an instruction that indicates the server to which it applies

1 ■	**E5-APP-B:** Log in as the user "root"	**`[hostname] consolelogin: root`** password: *password*

Figure 2. Example of an instruction that performs a specific command

1.6 Recommendations

This procedure should be followed thoroughly utilizing the steps as written. In the event any unexpected results are returned while executing steps in this procedure halt the activity and contact the Oracle Customer Care Center for assistance. The given outputs for procedures are being provided as a reference.

2. GENERAL DESCRIPTION

The platform that is used to host a query server must meet the minimum requirements shown in Table 22 in order to meet performance requirements.

Component	Minimum Requirement	Exact Requirement
Operating System	N/A	Solaris 10
Processor	400 MHz	N/A
Memory	512 Megabytes	N/A
Minimum Disk Space (in partition containing /usr/mysql1) See Note 1.	10 GB(for up to 48 million TNs) 20 GB(for up to 96 million TNs) 25 GB(for up to 120 million TNs) 40 GB(for up to 192 million TNs) 48 GB(for up to 228 million TNs) 82 GB(for up to 384 million TNs)	N/A
Minimum Disk Space (in root partition /)	4.5 GB	N/A
Note 1: The partitioning and setting up of the **/usr/mysql1** file system with the minimum required disk space are the responsibility of the customer. A larger disk drive is required for 384M TN as the required partition size may not be reached.		

Table 2: Query Server Platform Requirements

2.1 Additional Requirements

- Use a SPARC platform to host a query server
- Ensure the platform hosting a query server is dedicated to the query server function. Using the query server platform for any other processing degrades performance and may potentially conflict with the query server operation and produce unpredictable results.
- Use a dedicated 100BASE-TX Ethernet interface.

  NOTE: The network between the LSMS and the query server and between the query server and the daisy-chained query server must meet the specifications and conditions shown in Table 3 (for firewall protocol filtering).

Interface	TCP/IP Port	Use	Firewall configuration[1] – Port Open for Inbound Access(from Query Server)	Firewall configuration[1] – Port Open for Outbound Access(to Query Server)
LSMS > Query Server Uses the interface to the ELAP network, active only on active server For more information about which interface is used by the ELAP network, refer to the *LSMS Configuration Manual*.	20	FTP-data(database snapshot)	No	Yes[2]
	21	FTP(database snapshot)	No	Yes[2]
	3306	Continuous database replication	Yes[3]	No
Query Server (master) > Daisy Chained Query Server (slave)	20	FTP-data(database snapshot)	No	Yes[2]
	21	FTP(database snapshot)	No	Yes[2]
	3306	Continuous database replication	Yes[3]	No

1 The firewall port configuration is in respect to the master database server (LSMS or query server acting as both master and slave server) being behind the firewall and query servers acting only as slave servers on the other side.

2 The FTP TCP/IP port is required to be open on the LSMS and query servers that act as both master and slave. This port is used to retrieve the current "snapshot" of the master database so it can be loaded into the query server. The snapshots effectively become the initial version (starting point for replication) of the query server's database.

3 Port 3306 is required to be open on the LSMS and query servers that act as both master and slave. The query server connects to the master server on port 3306 to receive continuous replication updates. If the feature "Configurable MySQL port" is enabled on LSMS, the configured port is required to be open on the LSMS.

Table 3: Platform Ports Configuration for Firewall Protocol Filtering

3. FUNCTIONAL REQUIREMENTS FOR LSMS INTERFACE RE-ARCHITECTURE

The LSMS ResyncDB Query Server is fully compliant with all requirements identified in [4].

4. UPGRADE OVERVIEW

This section provides a detailed method to install or upgrade the Query Server application on SPARC Solaris 10.

4.1 Required Materials

1. Target release DVD or iso image if software is being provided electronically.
2. The capability to log into the server.
3. LSMS 13.0 Alarms and Maintenance Guide, E52612-01, Current Version, Oracle.
4. LSMS 13.0 Configuration Manual Guide, E52608-01, Current Version, Oracle.

Note: The iso image can be downloaded online. Go to the link "https://edelivery.oracle.com/".
Click on the "Sign In / Register" button. Sign in or register.

Select a Product Pack: Choose "Oracle Communications Applications".
Platform: Choose "Tekelec OS"
Click on the "Go" button.

4.2 Installation Phases for Query Server

The following table illustrates the progress of the installation process by procedure with estimated times and may vary due to differences in typing ability and system configuration. The phases outlined in Table 4 are to be executed in the order they are listed. Installation procedure assumes that servers already have SPARC Solaris 10 installed.

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	Cum.		
Pre-install check and Connectivity setup	30	30	Verify requirements for install are met and Set up connectivity to the Solaris server.	**Procedure 1**
Verify install	5	35	Verify this should be an install.	**Procedure 2**
Install Server	30	65	Install Application and make configuration changes.	**Procedure 3**
Reload database and Start Replication	35	100	Start replication from LSMS to Query Server.	**Procedure 5**

Table 4: Installation Phases for Query Server

4.3 Upgrade Phases for Query Server

The following table illustrates the progression of the upgrade process by procedure with estimated times and may vary due to differences in typing ability and system configuration. The phases outlined in Table 5 are to be executed in the order they are listed. Upgrade procedure assumes that the server has an Oracle-provided MySQL version lower than the target version that is already installed.

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	Cum.		
Pre-upgrade check and Connectivity setup	30	30	Verify requirements for upgrade are met and Set up connectivity to the server.	**Procedure 1**
Verify upgrade	5	35	Verify this should be an upgrade.	**Procedure 2**
Upgrade Server	30	65	Upgrade Application and make configuration changes.	**Procedure 4**
Reload database and Start Replication	35	100	Start replication from LSMS to Query Server.	**Procedure 5**

Table 5: Upgrade Phases for Query Server

4.4 Installation Phases for ResyncDB Query Server

The following table illustrates the progress of the installation process by procedure with estimated times and may vary due to differences in typing ability and system configuration. The phases outlined in Table 6 are to be executed in the order they are listed. Installation procedure assumes that servers already have SPARC Solaris 10 installed.

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	Cum.		
Pre-install check and Connectivity setup	30	30	Verify requirements for install are met and Set up connectivity to the Solaris server.	**Procedure 1**
Verify install	5	35	Verify this should be an install.	**Procedure 2**
Install Server	30	65	Install Application and make configuration changes.	**Procedure 3**
Configure LSMS	5	70	Configure LSMS for replication.	**Procedure 6**
Reload database and Start Replication	40	110	Start replication from LSMS to ResyncDB Query Server.	**Procedure 7**

Table 6: Installation Phases for ReyncDB Query Server

4.5 Installation Phases for Query Server with ResyncDB

The following table illustrates the progress of the installation process by procedure with estimated times and may vary due to differences in typing ability and system configuration. The phases outlined in Table 7 are to be executed in the order they are listed. Installation procedure assumes that servers already have SPARC Solaris 10 installed.

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	Cum.		
Pre-install check and Connectivity setup	30	30	Verify requirements for install are met and Set up connectivity to the Solaris server.	**Procedure 1**
Verify install	5	35	Verify this should be an install.	**Procedure 2**
Install Server	30	65	Install Application and make configuration changes.	**Procedure 3**
Configure LSMS	5	70	Configure LSMS for replication.	**Procedure 6**
Reload database and Start Replication	40	110	Start replication from LSMS to Query Server with ResyncDB.	**Procedure 8**

Table 7: Installation Phases for Query Server with ResyncDB

4.6 Log Files

All the messages are displayed on command prompt from where the install/upgrade command is executed. There is no separate log file maintained. However, a mysql log file /usr/mysql1/<hostname.err> may be referenced if replication does not start properly after install/upgrade.

5. PREPARATION

5.1 Pre-Installation / Pre-Upgrade Requirement Check

Procedure 1: Verifying Pre-Installation/Pre-Upgrade Requirements

S T E P #	This procedure verifies that all pre-installation/pre-upgrade requirements have been met. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. IF THIS PROCEDURE FAILS, CONTACT ORACLE CUSTOMER CARE CENTER REPRESENTATIVE AND ASK FOR ASSISTANCE.	
1 ☐	Verify all materials required are present	▪ Screen logging is required throughout the procedure. These logs should be made available to Oracle Customer Care Center representative in the event their assistance is needed. ▪ Target Oracle-provided MySQL release DVD or ISO image. ▪ The capability to log into a server, such as a PC with null modem cable for connection to serial port. Note: The iso image can be downloaded online. Go to the link "https://edelivery.oracle.com/". Click on the "Sign In / Register" button. Sign in or register. Select a Product Pack: Choose "Oracle Communications Applications". Platform: Choose "Tekelec OS" Click on the "Go" button.
2 ☐	Set up the console session.	Connect console connection with SSH or telnet.
3 ☐	Verify Oracle standard configurations	Verify that the Oracle standard configurations (mentioned default paths and config files etc.) are strictly followed. If not then contact the Oracle Customer Care Center for assistance.
End of Procedure		

5.2 Upgrade/Installation Determination

Procedure 2: Determine if the upgrade or installation is required.

S T E P #	This procedure provides instructions to determine if this will be an installation or an upgrade of existing software. **NOTE**: If you encounter a problem determining the version you have, or if you are unsure whether to install or upgrade, contact the Customer Care Center. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. IF THIS PROCEDURE FAILS, CONTACT ORACLE CUSTOMER CARE CENTER REPRESENTATIVE AND ASK FOR ASSISTANCE.	
1 ☐	**Solaris server**: Determine whether the Oracle-provided MySQL version is installed	Login on QS as root and run the following command: **# /opt/TKLCplat/mysql/bin/mysql -V** And **# /opt/mysql/mysql/bin/mysql -V** Examine the output of both the commands and proceed to the next step of this procedure.
2 ☐	**Solaris server**: Logout	**# logout**
3 ☐	**Solaris server**: Determine an installation is required.	If the output for both commands is the following: `/opt/mysql/mysql/bin/mysql: not found` Because the prompt is immediately returned with above output, perform an installation. Proceed to the next step in Table 4**.** Otherwise, proceed to the next step of this procedure.
4 ☐	**Solaris server**: Determine an upgrade is required.	If the output for any one of the two commands of step 1 is the following: **`/opt/mysql/mysql/bin/mysql Ver 14.12 Distrib 5.0.37, for sun-solaris2.8 (SPARC using readline 5.0`** The 'Distrib' value indicates the Oracle-provided version which was installed previously. If the 'Distrib' value is less than 5.6.14, then proceed to the next step to perform an installation by proceeding to the next step in Table 4. If the 'Distrib' value is greater than or equal to 5.6.14, then proceed with the upgrade procedure as mentioned in Table 5.
End of Procedure		

6. SOFTWARE INSTALL/UPGRADE PROCEDURE

Please read the following notes on upgrade procedures:

Procedure completion times shown here are estimates. Times may vary due to differences in database size, user experience, and user preparation.

Command steps that require user entry are indicated with white-on-black step numbers.

The shaded area within response steps must be verified in order to successfully complete that step.

Where possible, EXACT command response outputs are shown. EXCEPTIONS are as follows:

Banner information is displayed in a format form only.

System-specific configuration information such as *card location*, *terminal port # assignments*, and *system features.*

ANY information marked with "*XXXX*" or "*YYYY*." Where appropriate, instructions are provided to determine what output should be expected in place of "*XXXX* or *YYYY*"

After completing each step and at each point where data is recorded from the screen, the technician performing the upgrade must initiate each step. A check box should be provided.

Captured data is required for future support reference if Oracle Technical Services is not present during the upgrade.

6.1 Software Install Procedure

Procedure 3: Installing the Application

STEP #		
	This procedure installs the MySQL application on the server. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. Should this procedure fail, contact the Oracle Customer Care Center and ask for **UPGRADE ASSISTANCE**.	

1 ☐	**Solaris server:** Create the DB administrator user	Login on query server as root user.
		`# cd /usr/sbin`
		`# ./groupadd -g 1007 mysql`
		`# ./useradd -u 1001 -g 1007 -s /bin/sh mysql`
		`# passwd mysql`
		`passwd:  Changing password for mysql`
		`New password: <password for the mysql user>`
		`Re-enter password: <password for the mysql user>`

2 ☐	**Solaris server:** Create /usr/mysql1 directory if not exist	`# mkdir /usr/mysql1`
3 ☐	**Solaris server**: If Installing MySQL using DVD, otherwise skip this step	Insert the Installation Media into the DVD drive of Solaris server. Run the following command: `# cd /cdrom/cdrom0` Go to step 5.

4 ☐	**Solaris server:** Mount the iso if installing MySQL using iso	First copy the MySQL iso to /tmp directory of query server. Run the following commands:
		`# cd /`
		`# mkdir /mnt/iso`
		`# /usr/sbin/lofiadm -a /tmp/<Name of iso>`
		Example:
		# /usr/sbin/lofiadm -a /tmp/872-0000-101-13.0.0_1.0.0-LSMS.iso
		Output: /dev/lofi/1
		`# mount -F hsfs -o ro <Output of above command> /mnt/iso`
		Example:
		# mount -F hsfs -o ro /dev/lofi/1 /mnt/iso
		`# cd /mnt/iso`

5 ☐	**Solaris server:** Install MySQL package	`# ./install_mysql`
		Output similar to the following displays:
		`Performing installation of MySQL advanced version 5.6.14`
		`********************************`
		`Installation of <mysql> was successful.`

6 ☐	**Solaris server:** Unmount the iso if installed MySQL using iso. Otherwise skip this step	After completing the installation of MySQL, unmount the iso:
		`# cd /`
		
		`# umount /mnt/iso`

7 ☐	**Solaris server:** Eject the media if installed MySQL using DVD. Otherwise skip this step	After completing the installation of MySQL, eject the DVD and return the media to its case:
		`# cd /`
		
		`# eject cdrom`

8 ☐	**Solaris server:** Copy the configuration file to new path	`# cp /opt/mysql/mysql/support-files/my-default.cnf /opt/mysql/mysql/my.cnf`

9 ☐	**Solaris server:** Check ownership and permissions of /usr/mysql1 directory	`# ls -ltr /usr`
		
		If the ownership is anything other than mysql:mysql, change it using the following command:
		`# chown mysql:mysql /usr/mysql1`
		
		If the permissions is anything other than 755, change it using the following command:
		`# chmod 755 /usr/mysql1`
		
		Verify once more that the ownership has been changed.
		`# ls -ltr /usr`

10 ☐	**Solaris server :** Empty the old database directory if exists.	`# cd /opt/TKLCplat/mysql/`
		
		`# rm -rf *`

11 ☐	**Solaris server :** Modify MySQL configuration file	`# vi /opt/mysql/mysql/my.cnf`
		
		Remove the content of my.cnf and copy the following in my.cnf.
		
		`# The following options will be passed to all MySQL clients`
		`[client]`
		`port = 3306`
		`socket = /tmp/mysql.sock`
		
		`[mysqld]`
		`datadir = /usr/mysql1`
		`port = 3306` # NOTE: The port is required to be modified, if the feature "Configurable QS MySQL port" is enabled on LSMS.
		`socket = /tmp/mysql.sock`
		`server-id = <some unique number between 3 and 4,294,967,295, which is unique among all query servers in your network>`
		# NOTE: The server-id value must be different for each server participating in replication.
		
		`max_allowed_packet = 1M`
		`sort_buffer_size = 1M`
		`read_buffer_size = 1M`
		`read_rnd_buffer_size = 4M`
		`myisam_sort_buffer_size = 64M`
		`thread_cache_size = 8`
		`query_cache_size= 16M`

```
# Try number of CPU's*2 for thread_concurrency
thread_concurrency = 8

default-storage-engine=myisam
default_tmp_storage_engine=myisam

skip-innodb
net_read_timeout=30
max_allowed_packet=32M
slave-net-timeout=120
slave-skip-errors=1062
replicate-ignore-db=ResyncDB
replicate-wild-ignore-table=ResyncDB.%
replicate-ignore-db=logDB
replicate-wild-ignore-table=logDB.%
replicate-ignore-table=supDB.DbConfig
replicate-wild-ignore-table=supDB.%Key
replicate-ignore-table=supDB.LsmsUser
replicate-ignore-table=supDB.LsmsUserSpid
replicate-ignore-table=supDB.Authorization
replicate-ignore-table=supDB.EbdaProcessList
replicate-wild-ignore-table=supDB.%Measurements
replicate-ignore-table=supDB.AlarmFilter
replicate-ignore-db=mysql
replicate-wild-ignore-table=mysql.%
replicate-ignore-db=ReplTestDB
replicate-wild-ignore-table=ReplTestDB.%
replicate-ignore-db=performance_schema
replicate-wild-ignore-table=performance_schema.%

explicit_defaults_for_timestamp

# Replication Master Server (default)
# binary logging is required for replication
log-bin=mysql-bin

relay-log=queryserver-relay-bin

[mysqldump]
quick
max_allowed_packet = 16M

[mysql]
no-auto-rehash

[isamchk]
key_buffer = 128M
sort_buffer_size = 128M
read_buffer = 2M
write_buffer = 2M

[myisamchk]
key_buffer = 128M
sort_buffer_size = 128M
read_buffer = 2M
write_buffer = 2M
```

		[mysqlhotcopy] interactive-timeout **# NOTE: The Measurements tables are ignored by default. If the customer wants to replicate those tables, remove or comment out only the line: replicate-ignore-table=supDB.%Measurements from my.cnf file. When this is done, the customer must get new snapshots every time any ELAP is added to the LSMS system.**
12 ☐	**Solaris server :** Set permissions of my.cnf file	Run the following command to set the permissions of my.cnf. # chmod 644 /opt/mysql/mysql/my.cnf
13 ☐	**Solaris server :** Make a share directory on /usr/mysql1 path	In /usr/mysql1 directory, rename the "share" file with "share_file" file if exists, using the following command: # mv /usr/mysql1/share /usr/mysql1/share_file Create share directory, if does not exist. # cd /usr/mysql1 # mkdir share Run following command if errmsg.sys does not exist on /usr/mysql1/share path. **#** cp /opt/mysql/mysql/share/english/errmsg.sys /usr/mysql1/share
14 ☐	**Solaris server:** Change ownership and permissions of files in /usr/mysql1	Change the ownership and permission of files and directories of mysql1 directory in /usr/mysql1 by using the following commands: # chown mysql:mysql /usr/mysql1/* # chmod 755 /usr/mysql1/*
15 ☐	**Solaris server :** Initialise database	# su mysql # cd /opt/mysql/mysql/scripts # ./mysql_install_db --force # exit
16 ☐	**Solaris server**: Stop MySQL if running	• Check if mysql process is running: # ps –ef | grep mysql • If it is not running, directly go to next step of this procedure. If it is running, stop MySQL. # cd /opt/mysql/mysql/bin # ./mysqladmin shutdown –p # Enter password: # <Query server's MySQL root user password> If the password is unknown, use the following command: # kill <pid of mysqld_safe> <pid of mysqld> Verify that no MySQL process is running using the following command: # ps –eaf |grep mysql
17 ☐	**Solaris server:** Reset the password	• Change to directory /opt/mysql/mysql/bin # cd /opt/mysql/mysql/bin • Reset the password using the following commands: # ./mysqld_safe --skip-grant-tables & # ./mysql

		mysql> UPDATE mysql.user SET PASSWORD=PASSWORD('<Enter password>') WHERE USER = 'root'; Query OK, 2 rows affected (0.07 sec) Rows matched: 2 Changed: 2 Warnings: 0 mysql> flush privileges; Query OK, 0 rows affected (0.00 sec) mysql> exit; • Stop MySQL. # ./mysqladmin shutdown -p • Restart MySQL # ./mysqld_safe --basedir=/opt/mysql/mysql --skip-slave-start &
18 ☐	**Solaris server :** Installation Complete	Installation and configuration are now complete. Go to next step in Table 4.
End of Procedure		

THIS COMPLETES THE INSTALLATION

6.2 Software Upgrade Procedure

Procedure 4: Upgrading Application

S T E P #	This procedure upgrades the MySQL application on the server. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. SHOULD THIS PROCEDURE FAIL, CONTACT ORACLE TECHNICAL SERVICES AND **ASK FOR UPGRADE ASSISTANCE.**	

1 ☐	**Solaris server**: Stop MySQL replication	• Log into Query Server as root. Go to directory /opt/TKLCplat/mysql/bin
		`# cd /opt/TKLCplat/mysql/bin`
		
		• Stop MySQL:
		`# ./mysqladmin –u root –p shutdown`
		`Enter password: <mysql password>`

2 ☐	**Solaris server**: Backup the my.cnf file	Copy the /usr/mysql1/my.cnf file to /var/tmp/ directory. `# cp /usr/mysql1/my.cnf /var/tmp/`
3 ☐	**Solaris server:** Create /usr/mysql1 directory if not exist	`# mkdir /usr/mysql1`
4 ☐	**Solaris server**: If upgrading MySQL using DVD, otherwise skip this step	Insert the Upgrade Media into the DVD drive of Solaris server. Run the following command: `# cd /cdrom/cdrom0` Go to step 6.

5 ☐	**Solaris server:** Mount the iso if upgrading MySQL using iso	First copy the MySQL iso to /tmp directory of query server. Login on query server as root user and run the following commands:
		`# cd /`
		
		`# mkdir /mnt/iso`
		
		`# /usr/sbin/lofiadm -a /tmp/<Name of iso>`
		
		Example:
		# /usr/sbin/lofiadm -a /tmp/872-0000-101-13.0.0_1.0.0-LSMS.iso
		Output: /dev/lofi/1
		
		`# mount -F hsfs -o ro <Output of above command> /mnt/iso`
		
		Example:
		# mount -F hsfs -o ro /dev/lofi/1 /mnt/iso
		
		`# cd /mnt/iso`

6 ☐	**Solaris server:** Upgrade MySQL package	`# ./install_mysql`
		
		Output similar to the following displays:
		
		`Found installed package TKLCmysql on the server...`
		
		`The following package is currently installed:`
		`TKLCmysql TKLCAPP=TKLCmysql MySQL Relational Database (sparc) 5.0.90 Tekelec build 2010-06-22-11-12`
		
		`Do you want to remove this package? [y,n,?,q] y`
		
		`## Removing installed package instance <TKLCmysql>`
		`## Verifying package <TKLCmysql> dependencies in global zone`
		`## Processing package information.`
		`**********Removal of <TKLCmysql> was successful.`
		
		`Performing installation of MySQL advanced version 5.6.14`
		
		`Processing package instance <mysql> from </mnt/iso/mysql-advanced-5.6.14-solaris`
		
		`MySQL Advanced Server (Commercial)(sun4u) 5.6.14`
		`**********`
		`Installation of <mysql> was successful.`

7 ☐	**Solaris server:** Unmount the iso if upgraded MySQL using iso, otherwise skip this step	After completing the upgrade of MySQL, unmount the iso:
		`# cd /`
		
		`# umount /mnt/iso`

8 ☐	**Solaris server:** Eject the media if upgraded MySQL using DVD, otherwise skip this step	After completing the upgrade of MySQL, eject the DVD and return the media to its case:
		`# cd /`
		
		`# eject cdrom`

9 ☐	**Solaris server:** Check ownership of /usr/mysql1 directory	`# ls -ltr /usr`
		
		Change the ownership and permission of mysql1 directory in /usr by using the following commands:
		`# chown mysql:mysql /usr/mysql1`
		
		`# chmod 755 /usr/mysql1`
		
		Verify once more that the ownership and permission has been changed.
		`# ls -ltr /usr`

10 ☐	**Solaris server :** Empty the default database directory if exists	`# cd /opt/TKLCplat/mysql/data`
		
		`# rm -rf *`

11 ☐	**Solaris server:** Modify MySQL configuration file	Run the following command: `# vi /opt/mysql/mysql/my.cnf` Copy the content of Procedure 3 step 11 in my.cnf file and save it.

12 ☐	**Solaris server**: Stop MySQL if running	• Check if mysql process is running:
		`# ps –ef | grep mysql`
		
		• If it is not running, directly go to next step of this procedure. If it is running, stop MySQL.
		`# cd /opt/mysql/mysql/bin`
		`# ./mysqladmin shutdown -p`

13 ☐	**Solaris server:** Reset the password	• Change to directory /opt/mysql/mysql/bin
		`# cd /opt/mysql/mysql/bin`
		
		• Reset the password using the following commands:
		`# ./mysqld_safe --skip-grant-tables &`
		
		`# ./mysql`
		
		`mysql> UPDATE mysql.user SET PASSWORD=PASSWORD('<Enter password>') WHERE USER = 'root';`
		`Query OK, 2 rows affected (0.07 sec)`
		`Rows matched: 2 Changed: 2 Warnings: 0`
		
		`mysql> flush privileges;`
		`Query OK, 0 rows affected (0.00 sec)`
		
		`mysql> exit;`
		
		• Stop MySQL.
		`# ./mysqladmin shutdown -p`
		
		• Restart MySQL
		`# ./mysqld_safe --basedir=/opt/mysql/mysql --skip-slave-start &`

14 ☐	**Solaris server**: Upgrade complete	Upgrade and configuration are now complete. Go to next step in Table 5.
End of Procedure		

THIS COMPLETES THE UPGRADE

6.3 Start/Stop Replication Procedure for Query Server

Procedure 5: Start/Stop Replication for Query Server

S T E P #	This procedure is used to start/stop replication from LSMS to Query Server. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. SHOULD THIS PROCEDURE FAIL, CONTACT ORACLE TECHNICAL SERVICES AND **ASK FOR UPGRADE ASSISTANCE**.	

1 ☐	**Solaris server**: Stop MySQL replication	• Log into Query Server as root. Go to directory /opt/mysql/mysql/bin
		`# cd /opt/mysql/mysql/bin`
		
		• Check if mysql process is running:
		`# ps –ef | grep mysql`
		
		• If it is not running, directly go to step 3 of this procedure. If it is running, stop MySQL replication by stopping slave:
		`# ./mysql –u root –p`
		`Enter password:<Query server's MySQL root user password>`
		
		`mysql> stop slave;`
		
		• 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;`
		
		• Exit the MySQL command-line utility:
		`mysql> exit;`

2 ☐	**Solaris server**: Stop MySQL	Stop MySQL.
		`# cd /opt/mysql/mysql/bin`
		`# ./mysqladmin shutdown -p`

3 ☐	**LSMS server:** Create query server user on lsms	`# lsmsdb –c addrepluser –h <IP/Hostname of QS>  –p <mysqlpwd>`
4 ☐	**LSMS server:** Create and copy the snapshots from the LSMS server.	Please refer to the section "Reload a Query Server Database from the LSMS "of the Appendix E (Query Server Maintenance Procedures) from the LSMS 13.0 Alarms and Maintenance Guide, E52612-01, Current Version, Oracle.

5 ☐	**Solaris server:** Extract the snapshot data from the archive tar files copied from LSMS.	`# cd /usr/mysql1`
		
		`# gunzip -d mysql-snapshot-<regionDB>.tar.gz`
		
		`# tar -xvf mysql-snapshot-<regionDB>.tar`
		
		`# rm mysql-snapshot-<regionDB>.tar`
		
		In the above commands, replace <regionDB> with the regional database name (for example, CanadaDB).
		
		Execute the same commands for supDB and noreplDB snapshot files.

6 ☐	**Solaris server:** Verify ownership of database files and directories.	`# ls -ltr`
		If any database directories have ownership other than mysql:mysql, change them using this command:
		`# chown -R mysql:mysql <DB NAME>`
		
		`where <DB NAME> is supDB, noreplDB, or <region>DB,where <region> is the name of an NPAC region.`
		
		Also change the ownership of snapinfo.sql to mysql:mysql by executing the following command:
		`# chown mysql:mysql snapinfo.sql`

7 ☐	**Solaris server:** Open the snapinfo.sql file	`# vi snapinfo.sql` Refer to Appendix A.1 to modify the snapinfo.sql file.

8 ☐	**Solaris server**: Verify MySQL tables if following the upgrade procedure, otherwise skip it.	• Restart MySQL
		`# ./mysqld_safe --basedir=/opt/mysql/mysql --skip-slave-start &`
		
		• Start MySQL session:
		`# ./mysql -u root –p`
		`Enter password:<Query server's MySQL root user password>`
		
		• Verify the tables present in the MySQL database:
		`mysql> use mysql;`
		`mysql> show tables;`
		`+---------------------------+`
		`| Tables_in_mysql |`
		`+---------------------------+`
		`| columns_priv |`
		`| db |`
		`| event |`
		`| func |`
		`| general_log |`
		`| help_category |`
		`| help_keyword |`
		`| help_relation |`
		`| help_topic |`
		`| innodb_index_stats |`
		`| innodb_table_stats |`
		`| ndb_binlog_index |`
		`| plugin |`
		`| proc |`
		`| procs_priv |`
		`| proxies_priv |`
		`| servers |`
		`| slave_master_info |`
		`| slave_relay_log_info |`
		`| slave_worker_info |`
		`| slow_log |`
		`| tables_priv |`
		`| time_zone |`
		`| time_zone_leap_second |`
		`| time_zone_name |`
		`| time_zone_transition |`
		`| time_zone_transition_type |`
		`| user |`

		+--------------------------+ 28 rows in set (0.00 sec) Exit from the MySQL command line utility and execute the below commands in case above query doesn't return same output, otherwise continue to the next step. mysql> exit; # cd /opt/mysql/mysql/bin # ./mysql_upgrade –u root –p Enter password:<Query server's MySQL root user password> Note: Please ignore if there is any error in the output of above command and again verify MySQL tables by using step 8 of this procedure. If the output still differs then contact the Oracle Customer Care Center for assistance, otherwise continue to the next step.
9 ☐	**Solaris server**: Create replication user	• Log into Query Server as root. Change to directory /opt/mysql/mysql/bin # cd /opt/mysql/mysql/bin • Start MySQL session: # ./mysql -u root –p Enter password:<Query server's MySQL root user password> mysql> create user 'lsmsslave'@'localhost' identified by 'mysql123'; mysql> create user 'lsmsslave'@'%' identified by 'mysql123'; mysql> grant super,replication client on *.* to 'lsmsslave'@'%';
10 ☐	**Solaris server:** Reset configuration information	mysql> reset master; mysql> reset slave;
11 ☐	**Solaris server: S**tart replication from the correct position on the master	mysql> source /usr/mysql1/snapinfo.sql
12 ☐	**Solaris server:** Start mysql slave	mysql> start slave;
13 ☐	**Solaris server:** Check slave status	mysql> show slave status\G In the output of above command, ensure that values corresponding to columns Slave_IO_Running and Slave_SQL_Running are set to Yes.
14 ☐	**Solaris server:** If the column value of both Slave_IO_Running and Slave_SQL_Running are other than Yes, the status is not good and the error will need to be	# vi usr/mysql1/*.err Look at last few lines of error log and record the errors below. Record error here:

	investigated.	Contact the Oracle Customer Care Center and ask for assistance. Continue from step 13 of this procedure after error resolution.

15 ☐	**LSMS server:** Login to the LSMS Primary server and verify that Query Server is Connected.	login as: lsmsadm
		lsmsadm@IP's password:<Enter Password>
		
		`$ lsmsdb -c queryservers`
		
		Example:
		$ lsmsdb -c queryservers
		Output: cs2-bss2 (10.253.110.72) Connected
		
		You have now completed this procedure. Query Server has started replicating data from LSMS.

End of Procedure		

7. RECOVERY PROCEDURES

Upgrade procedure recovery issues should be directed to the Oracle Customer Care Center. Contact the Oracle Customer Care Center at 1-888-FOR-TKLC (1-888-367-8552); or 1-919-460-2150 (international).

8. INTERFACE DESCRIPTIONS

Refer to [5], Appendix A, section “Interface Support” for details.

9. PERFORMANCE CHARACTERISTICS

Refer to [5], Appendix A for details.

10. RESYNCDB QUERY SERVER INSTALLATION AND CONFIGURATION

For more information, refer to [5], Appendix A, section "Query Server Installation and Configuration Procedures."

10.1 MySQL Replication Configuration for LSMS

WARNING: The following procedure may briefly interrupt traffic being sent from the NPAC to Eagles and local LSMS provisioning. The time required to accomplish this procedure depends on the bandwidth of the customer's network and the amount of data to be reloaded. It is recommended that this procedure be performed during a maintenance window to minimize service interruption.

Procedure 6: MySQL Replication Configuration for LSMS

S T E P #		
	This procedure is for configuring the LSMS to support the directly hosted ResyncDB Query Server; the entire section should be run on the active primary server unless specified for others. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. SHOULD THIS PROCEDURE FAIL, CONTACT ORACLE TECHNICAL SERVICES AND **ASK FOR UPGRADE ASSISTANCE.**	
1 ☐	**LSMS server:** Activate LSMS Query Server feature	To activate the Query Server feature, contact Oracle's Tekelec Customer Services (call 1-888-FOR-TKLC or email to support@tekelec.com). The Query Server feature is an optional feature and must be activated at the LSMS for use.
2 ☐	**LSMS server:** Update /etc/hosts file	On both active and standby LSMS servers, associate the name of the ResyncDB Query Server host with its Internet Protocol (IP) address by adding an *IP address* and *hostname* pair for the ResyncDB Query Server to the `/etc/hosts` file. **`# vi /etc/hosts`** The hostname of the ResyncDB Query Server will be used to identify the ResyncDB Query Server when reporting on its status.
3 ☐	**LSMS server:** Create query server user on lsms	`# lsmsdb -c addrepluser -h <IP/Hostname of QS>  -p <mysqlpwd>` SECURITY NOTE: The combination of username and password is unique for replication use and only provides read access to the resynchronization binary log on the LSMS system. The <IP/hostname> here belongs to the ResyncDB Query Server IP/hostname.
End of Procedure		

10.2 MySQL Replication Configuration for ResyncDB Query Server

Note: If the ResyncDB Query Server shares the same platform with the regular Query Server and both features are enabled, go to section 10.3.

Procedure 7: MySQL Replication Configuration for ResyncDB Query Server

S T E P #	This procedure is for configuring the ResyncDB Query Server platform (directly hosted from the LSMS) for the ResyncDB Query Server function. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. SHOULD THIS PROCEDURE FAIL, CONTACT ORACLE TECHNICAL SERVICES AND **ASK FOR UPGRADE ASSISTANCE**.	

1 ☐	**Solaris server:** Create a link to ResyncDB directory	Run the following command:
		`# mkdir -p /var/TKLC/lsms/db`
		`# ln -s /usr/mysql1/ResyncDB /var/TKLC/lsms/db/ResyncDB`

2 ☐	**Solaris server:** Reload a ResyncDB Query Server database from the LSMS	Refer to section F.2F.2.7 to reload a ResyncDB Query Server database from the LSMS.
3 ☐	**Solaris server:** Start replication	Refer to Procedure 5 step 6 to step 15 to start replication. Note: The Query Server will connect to the master and catch up on any updates that happened since the snapshot was taken. Once the Query Server is replicating, you will find a file called master.info in the same directory as your error log. The master.info file is used by the Query Server to keep track of how much of the master's binary log it has processed. Do not remove or edit this file.
End of Procedure		

10.3 MySQL Replication Configuration for Query Server with ResyncDB

Note: This section is for the case that the ResyncDB Query Server shares the same platform with the regular Query Server and both features are enabled.

Procedure 8: MySQL Replication Configuration for Query Server with ResyncDB

S T E P #	This procedure is for configuring the Query Server platform (directly hosted from the LSMS) for the Query Server function with ResyncDB Query Server function. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. SHOULD THIS PROCEDURE FAIL, CONTACT ORACLE TECHNICAL SERVICES AND **ASK FOR UPGRADE ASSISTANCE.**	

1 ☐	**Solaris server:** Create a link to ResyncDB directory	Run the following command:
		`# mkdir -p /var/TKLC/lsms/db`
		`# ln -s /usr/mysql1/ResyncDB /var/TKLC/lsms/db/ResyncDB`

2 ☐	**Solaris server:** Reload a ResyncDB Query Server database from the LSMS	Refer to section F.2F.2.8 to reload a ResyncDB Query Server database from the LSMS.
3 ☐	**Solaris server:** Start replication	Refer to Procedure 5 step 6 to step 15 to start replication. Note: The Query Server will connect to the master and catch up on any updates that happened since the snapshot was taken. Once the Query Server is replicating, you will find a file called master.info in the same directory as your error log. The master.info file is used by the Query Server to keep track of how much of the master's binary log it has processed. Do not remove or edit this file.
End of Procedure		

APPENDIX A. GENERIC PROCEDURES

A.1 Set Master Information

Procedure 9: Set the master information on QS

S T E P #	This procedure is used to update the master information in snapinfo.sql file on Query Server. Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. SHOULD THIS PROCEDURE FAIL, CONTACT ORACLE TECHNICAL SERVICES AND **ASK FOR UPGRADE ASSISTANCE.**	
1 ☐	**Solaris server:** If Configurable MySQL port feature is not enabled on LSMS, edit the snapinfo.sql file as indicated, otherwise, go to next step.	The value of master-port on Query Server should be same as configured on LSMS. Edit the snapinfo.sql file as follows: `CHANGE MASTER TO MASTER_HOST='10.248.10.80', MASTER_USER='lsmsrepl', MASTER_PASSWORD='mysql123', MASTER_LOG_FILE='mysql-bin.000006', MASTER_LOG_POS=17020215` Where MASTER_HOST = <VIP of the LSMS pair, where VIP is the Virtual IP address> MASTER_USER = <replication user name of LSMS> MASTER_PASSWORD = <replication user's password> Skip next steps and go back to the Procedure 5 step 8. Note: We can directly run the command written in file on mysql prompt followed by semicolon and can skip the Procedure 5 step 11.
2 ☐	**LSMS server:** If the MySQL port is changed for LSMS using GUI	Run the following command: `# lsmsdb -c masterstatus` Example: # lsmsdb -c masterstatus mysql-bin.000080 79245037 Where mysql-bin.000080 is the value of MASTER_LOG_FILE and 79245037 is the value of MASTER_LOG_POS. Go to next step.
3 ☐	**Solaris server:** If Configurable MySQL port feature is enabled on LSMS	Refer to step 2 of this procedure to get the value of MASTER_LOG_FILE and MASTER_LOG_POS. The value of master-port on Query Server should be same as configured on LSMS using GUI. Edit the snapinfo.sql file as follows: `CHANGE MASTER TO MASTER_HOST='10.248.10.80', MASTER_USER='lsmsrepl', MASTER_PASSWORD='mysql123', MASTER_PORT=3456, MASTER_LOG_FILE='mysql-bin.000006', MASTER_LOG_POS=17020215` Where MASTER_HOST = <VIP of the LSMS pair, where VIP is the Virtual IP address> MASTER_USER = <replication user name of LSMS> MASTER_PASSWORD = <replication user's password> MASTER_PORT = <Port on which LSMS is connecting with QS> Note: We can directly run the command written in file on mysql prompt followed by semicolon and can skip the Procedure 5 step 11.
End of Procedure		

APPENDIX B. PLATFORM REQUIREMENTS AND RECOMMENDATIONS

Refer to [5], Appendix A, section “Query Server Platform Requirements”.

Note: If the ResyncDB Query Server shares the same platform with the regular Query Server, the minimum disk space needs to be increased 2 GB.

APPENDIX C. LSMSDB COMMAND SUMMARY

For information about the lsmsdb command, refer to [6], Appendix A.

APPENDIX D. QUERY SERVER ERROR LOG

For more information, refer to [6], Appendix E, section “Query Server Error Log”.

APPENDIX E. RETRIEVING INFORMATION ABOUT DATABASE FIELDS

For more information refer to [6], Appendix E, section “Retrieving Information from LNP Database Fields”.

APPENDIX F. MAINTENANCE ACTIONS

F.1 LSMS Maintenance Actions

Refer to [6], Appendix E, sections “Check Connection Status of Directly Connected Query Servers” and “Maintain the Binary Log on the Query Servers”.

F.2 ResyncDB Query Server Maintenance Actions

F.2.1 Binary Log Maintenance on ResyncDB Query Server

Refer to [6], Appendix E, section “Maintain the Binary Log on Query Servers”.

F.2.2 Checking MySQL Replication Status on ResyncDB Query Server

Refer to [6], Appendix E, section “Check MySQL Replication Status on Query Servers”.

F.2.3 Starting MySQL Replication on ResyncDB Query Server

Refer to [6], Appendix E, section “Start MySQL Replication on Query Servers”.

F.2.4 Stopping MySQL Replication on ResyncDB Query Server

Refer to [6], Appendix E, section “Stop MySQL Replication on Query Servers”.

F.2.5 Checking for Running Backups

Refer to [6], Appendix E, section “Check for Running Backups”.

F.2.6 Cleaning Up after Failed or Interrupted Snapshot

Refer to [6], Appendix E, section “Clean Up After Failed or Interrupted Snapshot”.

F.2.7 Reloading a ResyncDB Query Server Database from the LSMS

Note: If the ResyncDB Query Server shares the same platform with the regular Query Server and both features are enabled, go to section F.2.8.

Procedure 10: Reload ResyncDB Query Server Database from the LSMS

S T E P #	This procedure reloads a corrupted or back level Query Server's database by copying the LSMS LNP database. Login as the root user on the active LSMS server: Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. SHOULD THIS PROCEDURE FAIL, CONTACT ORACLE TECHNICAL SERVICES AND **ASK FOR UPGRADE ASSISTANCE.**	
1 ☐	**LSMS server:** Check that no database backups are running	Refer section F.2.5.

2 ☐	**LSMS server:** Create database snapshot	First remove the existing snapshot using following command
		`# rm –f /var/TKLC/lsms/free/mysql-snapshot-*.tar.gz`
		If only the ResyncDB Query Server running on this platform, enter following command, Otherwise run next command:
		`# lsmsdb –c resyncsnapshot`
		If unsuccessful, clean up (see section F.2.6).

3 ☐	**LSMS server:** Transfer database snapshot on QS	Run the following command:
		`# cd /var/TKLC/lsms/free`
		`# ftp <IP address of the ResyncDB Query Server>`
		`ftp> cd /usr/mysql1`
		`ftp> bin`
		`ftp> mput mysql-snapshot-ReyncDB.tar.gz snapinfo.sql`
		`(Note: Input "y" for each prompt.)`
		`ftp> bye`

4 ☐	**Solaris server:** Stop MySQL if running	On the ResyncDB Query Server, run the following command:
		`# cd /opt/mysql/mysql/bin`
		`# ./mysqladmin –u root –p shutdown`
		`Enter password:`
		<ResyncDB Query Server's MySQL user root password>

5 ☐	**Solaris server:** Extract the snapshot data from the archive tar	On the ResyncDB Query Server, run the following command:
		`# cd /usr/mysql1`
		`# gunzip –c mysql-snapshot-ResyncDB.tar.gz | tar -xvf –`
		`# ls –l`
		`# rm –f mysql-snapshot-ResyncDB.tar.gz`

End of Procedure		

F.2.8 Reloading Databases from the LSMS for Query Server with ResyncDB

Note: This section is for the case that the ResyncDB Query Servers share the same platform with the regular Query Server and both features are enabled.

Procedure 11: Reload databases from the LSMS for Query Server with ResyncDB

S T E P #	This procedure reloads corrupted or back level Query Server databases by copying the LSMS LNP databases. Login as the root user on the active LSMS server: Check off (√) each step as it is completed. Boxes have been provided for this purpose under each step number. SHOULD THIS PROCEDURE FAIL, CONTACT ORACLE TECHNICAL SERVICES AND **ASK FOR UPGRADE ASSISTANCE.**	
1 ☐	**LSMS server:** Check that no database backups are running	Refer section F.2.5.

2 ☐	**LSMS server:** Create database snapshot	First remove the existing snapshot using following command
		`# rm –f /var/TKLC/lsms/free/mysql-snapshot-*.tar.gz`
		
		If only the ResyncDB Query Server running on this platform, enter following command, Otherwise run next command:
		`# lsmsdb –c snapshot –i ResyncDB`
		If unsuccessful, clean up (see section F.2.6).

3 ☐	**LSMS server:** Transfer database snapshot on QS	Run the following command:
		
		`# cd /var/TKLC/lsms/free`
		`# ftp <IP address of the Query Server>`
		
		`ftp> cd /usr/mysql1`
		`ftp> bin`
		`ftp> mput mysql-snapshot-*.tar.gz snapinfo.sql`
		`(Note: Input "y" for each prompt.)`
		`ftp> bye`

4 ☐	**Solaris server:** Stop MySQL if running	On the ResyncDB Query Server, run the following command:
		
		`# cd /opt/mysql/mysql/bin`
		`# ./mysqladmin –u root –p shutdown`
		`Enter password:`
		`<Query Server's MySQL user root password>`

5 ☐	**Solaris server:** Extract the snapshot data from the archive tar	On the ResyncDB Query Server, run the following command:
		
		`# cd /usr/mysql1`
		`# gunzip –c mysql-snapshot-<extractDB>.tar.gz | tar -xvf –`
		`# ls -l`
		`# rm –f mysql-snapshot-<extractDB>.tar.gz`

End of Procedure		

APPENDIX G. DATABASE STRUCTURE FOR FAR-END APP DEVELOPMENT

```
--

-- Create LastTimestamp table
--
-- The LastTimestamp table consists of a single field which defines the
-- earliest (or last valid) timestamp that can be resynced. It is the
-- timestamp of the last record deleted from the resync database.
--
CREATE TABLE  LastTimestamp
(
    timestamp INT NOT NULL DEFAULT 0
)
TYPE = MyIsam;

--
-- Create temporary prototype ResyncRecord table used by each region
--


CREATE TABLE IF NOT EXISTS ResyncRecordModel
(
    -- The time the ResyncRecord was created (not written)
    timestamp INT UNSIGNED NOT NULL,
    -- The filter type  (True if TN otherwise Gtt Group)
    tnFilter  BOOL      NOT NULL,
    -- Set if filtertype is TN (data from regions and splits from LdMan)
    region    CHAR(40),
    -- Set if filtertype is TN (data from regions and splits from LdMan)
    npaNxx    CHAR(6),
    -- Set if filtertype is GTT (data from LdMan except splits)
    gttGroup  CHAR(40),
    -- The serialized RmtpMsg
    rmtpMsg   BLOB,
    -- HSOP function id
    hsopFid TINYINT UNSIGNED NOT NULL,
    -- HSOP command. Full HSOP pipe delimited record with FID + length + <DBTS> + data
    hsopCommand VARCHAR(200) NOT NULL,
    -- data, extra data field used by SprintLDD. Pipe delimited record
    -- that holds different data based on HSOP FID
    data VARCHAR(100)
)
TYPE = MyIsam;

-- Create CanadaResyncRecord table
CREATE TABLE  CanadaResyncRecord
(
   KEY (timestamp)
) SELECT * FROM ResyncRecordModel;

-- Create NortheastResyncRecord table
CREATE TABLE  NortheastResyncRecord
(
   KEY (timestamp)
) SELECT * FROM ResyncRecordModel;

-- Create MidAtlanticResyncRecord table
CREATE TABLE  MidAtlanticResyncRecord
(
   KEY (timestamp)
) SELECT * FROM ResyncRecordModel;

-- Create MidwestResyncRecord table
CREATE TABLE  MidwestResyncRecord
(
   KEY (timestamp)
) SELECT * FROM ResyncRecordModel;

-- Create SoutheastResyncRecord table
CREATE TABLE  SoutheastResyncRecord
(
   KEY (timestamp)
) SELECT * FROM ResyncRecordModel;
```

```
-- Create SouthwestResyncRecord table
CREATE TABLE  SouthwestResyncRecord
(
    KEY (timestamp)
) SELECT * FROM ResyncRecordModel;

-- Create WestCoastResyncRecord table
CREATE TABLE  WestCoastResyncRecord
(
    KEY (timestamp)
) SELECT * FROM ResyncRecordModel;

-- Create WesternResyncRecord table
CREATE TABLE  WesternResyncRecord
(
    KEY (timestamp)
) SELECT * FROM ResyncRecordModel;

-- Create LocalDataResyncRecord table
CREATE TABLE  LocalDataResyncRecord
(
    KEY (timestamp)
) SELECT * FROM ResyncRecordModel;

--
-- Create Merge table of all resync records
--
CREATE TABLE  ResyncRecord
(
    KEY(timestamp)
) TYPE = MERGE
UNION=(CanadaResyncRecord, NortheastResyncRecord, MidAtlanticResyncRecord,
       MidwestResyncRecord, SoutheastResyncRecord, SouthwestResyncRecord,
       WestCoastResyncRecord, WesternResyncRecord, LocalDataResyncRecord)
SELECT * FROM ResyncRecordModel;
```

APPENDIX H. RMTPMSG

Customer can get 'hsopFid', 'timestamp', 'hsopCommand' and 'data' from the ResyncRecord table of ResyncDB.

The 'timestamp' column stores the timestamp when this record was created. Note: this value is in epoch format, i.e, it is in seconds since January 1, 1970 00:00:00.

The'hsopCommand' column stores the data record.

The 'data' column stores the extra LDD data.

The 'hsopFid' column stores the function ID. A rmtpMsg has one of the following 4 function IDs :

HSOP_UPD_SUB_TS = 39 for Create SubscriptionVersion (SV) or Number Pool Block (NPB) Message
HSOP_DLT_SUB_TS = 43 for Delete SV or NPB Message
HSOP_UPD_NPA_SPLIT_TS = 42 for Create NPA Split Message
HSOP_DLT_NPA_SPLIT_TS = 46 for Delete NPA Split Message

1. If the function ID is 39 (HSOP_UPD_SUB_TS), the contents of 'hsopCommand' is in the following format:

   TN|LRN|SPID|LNPType|classDPC|classSSN|lidbDPC|lidbSSN|isvmDPC|isvmSSN|cnamDPC|cnamSSN|wsmscDPC|wsmscSSN'\n'

Field Name	Value in Example	Range of Values
TN	3031231000	[0-9]{10 digits}
LRN	1234567890	[0-9]{10 digits}
SPID	0001	[0-9A-Z]{4 digits}
LNPType	0	
classDPC	001001001	[001…255][000…255][000…255]
classSSN	123	[0…255]
lidbDPC	001001001	[001…255][000…255][000…255]
lidbSSN	123	[0…255]
isvmDPC	001001001	[001…255][000…255][000…255]
isvm SSN	123	[0…255]
cnamDPC	001001001	[001…255][000…255][000…255]
cnamSSN	123	[0…255]
wsmscDPC	001001001	[001…255][000…255][000…255]
wsmscSSN	123	[0…255]

   - If LNPType = "3", then this message is a Create NPB Message, and the last 3 characters of the TN should be "***". The contents of the 'data' column are in this format:

     ActivationTimestamp|'\0'.

Field Name	Value in Example	Range of Values
ActivationTimestamp	19960916152337	yyyymmddhhmmss

   - If LNPType = "1" or "2", this is a Create SV Message. The TN is a real telephone number. The contents of the 'data' column are in this format:

     ActivationTimestamp|EndUserLocationValue|EndUserLocationType|BillingId|'\0'

Field Name	Value in Example	Range of values
ActivationTimestamp	19960916152337	yyyymmddhhmmss
EndUserLocationValue	123456789012	
EndUserLocationType	12	
Billing ID	0001	

2 If the function ID is 43 (HSOP_DLT_SUB_TS),), then the contents of 'hsopCommand' are in the following format:

TN'\n'

Field Name	Value in Example	Range of Values
TN	3031231000	[0-9]{10 digits}

- If the last 3 characters of the TN are "***", then this is a message for Delete NPB.
- Otherwise, this is a message for Delete SV.

3. If the function ID is 42 (HSOP_UPD_NPA_SPLIT_TS), then this is a Create NPA Split Message. The contents of 'hsopCommand' are in the following format:

   newNPANxx|oldNPANxx'\n'

Field Name	Value in Example	Range of Values
newNPANxx	302123	[0-9]{6 digits}
oldNPANxx	301123	[0-9]{6 digits}

4. If the function ID is 46 (HSOP_UPD_NPA_SPLIT_TS), then this is a Delete NPA Split Message. The contents of 'hsopCommand' are in the following format:

   oldNPANxx'\n'

Field Name	Value in Example	Range of Values
oldNPANxx	301123	[0-9]{6digits}

- The contents of the 'data' column are in this format:

oldNPA|newNPA|Nxx|startPDP|endPDP|regionName|'\0'

Field Name	Value in Example	Range of Values
newNPA	302	[0-9]{3 digits}
oldNPA	301	[0-9]{3 digits}
Nxx	123	[0-9]{3 digits}
startPDP	19960101	yyyymmdd
endPDP	19960105	yyyymmdd
regionName	Midwest	one of 8 region names

APPENDIX I. SWOPS SIGN OFF.

Discrepancy List

Date	Test Case	Description of Failures and/or Issues. Any CSR's / RMA's issued during Acceptance. Discrepancy	Resolution and SWOPS Engineer Responsible	Resolution Date:

APPENDIX J. CUSTOMER SIGN OFF

Sign-Off Record

*** **Please review this entire document**. ***
This is to certify that all steps required for the upgrade successfully completed without failure.

Sign your name, showing approval of this procedure, and fax this page and the above SWOPS Sign Off Discrepancy List to Oracle, FAX # 919-461-1083.

Customer: Company Name: _____ Date: _____

Site: Location:_____

Customer:(Print)_____ Phone:_____

Fax: _____

Start Date: _____ Completion Date: _____

This procedure has been approved by the undersigned. Any deviations from this procedure must be approved by both Oracle and the customer representative. A copy of this page should be given to the customer for their records. The SWOPS supervisor will also maintain a signed copy of this completion for future reference.

Oracle Signature: _____ Date: _____

Customer Signature: _____ Date: _____

APPENDIX K. ACCESSING ORACLE'S TEKELEC CUSTOMER SUPPORT SITE

Access to the Oracle's Tekelec Customer Support site is restricted to current Tekelec customers. This section describes how to log into Oracle's Tekelec Customer Support site and how to locate upgrade procedures. Viewing these files requires Adobe Acrobat Reader.

1. Go to Oracle's Tekelec Customer Support login page at https://support.tekelec.com/index.asp
2. Enter your assigned username and chosen password and click **Login.**

   Or, if you do not have access to the Customer Support site, click **Need an Account?**
   Follow instructions on the screen.

   Note: After 20 minutes of inactivity, you will be logged off, and you must repeat this step to regain access.

3. After successful login, select a product from the Product Support drop-down menu.
4. Select a release number from the Product Support Release drop-down menu.
5. Locate the Upgrade Procedures section.
6. To open the procedure in the same window, click the procedure name. To open the procedure in a new window, right-click the procedure name and select **Open in New Window**.
7. To download the procedure, right-click the procedure name and select **Save Target As**.