

EAGLE[®] XG Subscriber Database Server

Release 4.0

SDS Online Help

910-6565-001 Revision A

August 2012



Copyright 2012 Tekelec. All Rights Reserved. Printed in USA.

Legal Information can be accessed from the Main Menu of the optical disc or on the Tekelec Customer Support web site in the *Legal Information* folder of the *Product Support* tab.

Table of Contents

Chapter 1: Introduction.....	7
Purpose of this documentation.....	8
Online Help organization.....	8
Scope and Audience.....	9
Documentation Admonishments.....	9
Customer Care Center.....	9
Emergency Response.....	12
Related Publications.....	12
Locate Product Documentation on the Customer Support Site.....	12
Chapter 2: Subscriber Database Server (SDS) overview.....	14
Chapter 3: Configuration.....	16
Options configuration.....	17
Options configuration elements.....	17
Editing options.....	22
Connections configuration.....	22
Connections configuration elements.....	23
Viewing connections.....	23
Inserting connections.....	24
Editing connections.....	24
Deleting connections.....	25
NAI Hosts configuration.....	25
NAI Hosts configuration elements.....	25
Viewing NAI hosts.....	26
Inserting NAI hosts.....	26
Deleting NAI hosts.....	26
Destinations configuration.....	27
Destinations configuration elements.....	27
Retrieving destinations.....	28
Adding destinations.....	29
Updating destinations.....	29
Deleting destinations.....	30
Destination map configuration.....	30

Destination map configuration elements.....	30
Viewing Destination Map connections.....	31
Inserting Destination Maps.....	31
Editing Destination Maps.....	32
Deleting Destination Maps.....	32
Routing entities configuration.....	33
Routing entities configuration elements.....	33
Retrieving routing entities.....	35
Adding routing entities.....	35
Updating routing entities.....	36
Deleting routing entities.....	36

Chapter 4: Maintenance.....38

Connections maintenance	39
Connections maintenance elements.....	39
Viewing connections status.....	40
Command Log maintenance.....	41
Command Log maintenance elements.....	41
Viewing maintenance command logs history.....	41
Relay Exception Log.....	42
Relay Exception Log maintenance elements.....	42
Viewing exception logs history.....	43
Import Status maintenance.....	44
Import Status maintenance elements.....	44
Viewing import files.....	45
Export maintenance.....	46
Schedule.....	47
Status.....	51
Audit	53
Audit elements.....	54
Viewing the status of an audit.....	55
Requesting an audit.....	57
Remote Audit	57
Remote Audit elements.....	58
Viewing the status of a remote audit.....	60
Requesting a remote audit.....	60
Query	61
Query elements.....	61
Running a query (MSISDN or IMSI).....	63
Running a query (NAI User).....	64

Running a query (Wildcard NAI User, NAI Host, Destination, Counts, Counts by Destination, or DB Level).....	64
NPA Splits maintenance.....	65
NPA Splits elements.....	65
Viewing NPA Splits.....	66
Creating an NPA Split.....	67
Modifying an NPA Split.....	67
Deleting an NPA Split.....	68
Glossary.....	69

List of Tables

Table 1: Admonishments.....	9
Table 2: Options Configuration Elements.....	18
Table 3: Connections Configuration Elements.....	23
Table 4: NAI Hosts Configuration Elements.....	25
Table 5: Destinations Configuration Elements.....	27
Table 6: Destination Map Elements.....	30
Table 7: Routing Entities Configuration Elements.....	33
Table 8: Connections Maintenance Elements.....	39
Table 9: Connection Status filtering categories.....	40
Table 10: Connection Status filtering operators.....	40
Table 11: Connection status refresh time.....	41
Table 12: Command Log Maintenance Elements.....	41
Table 13: Command Log filtering categories.....	42
Table 14: Exception Log Maintenance Elements.....	43
Table 15: Relay Exception Log filtering categories.....	43
Table 16: Import Status Maintenance Elements.....	44
Table 17: Import Status filtering categories.....	45
Table 18: Connection Status filtering operators.....	46
Table 19: Connection status refresh time.....	46
Table 20: Interfaces for Subscriber Data Types.....	47
Table 21: Export Schedule Maintenance Elements.....	47
Table 22: Export Schedule filtering categories.....	48
Table 23: Export Schedule filtering operators.....	48
Table 24: Export Data Types.....	49
Table 25: Export Data Types.....	50
Table 26: Export Status Maintenance Elements.....	51
Table 27: Export Status filtering categories.....	52
Table 28: Export Status filtering operators.....	53
Table 29: Export status refresh time.....	53
Table 30: Audit Status Elements.....	54
Table 31: Audit Request Elements.....	55
Table 32: Audit filtering categories.....	55
Table 33: Audit filtering operators.....	56
Table 34: Audit display refresh time.....	56
Table 35: Remote Audit Request Elements.....	58
Table 36: Remote Audit Status Elements.....	58
Table 37: Audit filtering operators.....	60

Table 38: Audit display refresh time.....	60
Table 39: Query Entry Elements.....	62
Table 40: Query Results Elements.....	62
Table 41: NPA Splits Maintenance Elements.....	65

Chapter 1

Introduction

Topics:

- *Purpose of this documentation.....8*
- *Online Help organization.....8*
- *Scope and Audience.....9*
- *Documentation Admonishments.....9*
- *Customer Care Center.....9*
- *Emergency Response.....12*
- *Related Publications.....12*
- *Locate Product Documentation on the Customer Support Site.....12*

Introduction provides a content overview of this guide with a brief summary about incidents, notifications, and the ID ranges for alarms and events. It also includes Tekelec contact information and how to locate product documentation on the Tekelec Customer Support site.

Purpose of this documentation

This documentation:

- Gives a conceptual overview of the application's purpose, architecture, and functionality
- Describes the pages and fields on the application GUI (Graphical User Interface)
- Provides procedures for using the application interface
- Explains the organization of, and how to use, the documentation

Online Help organization

There are eight items on the main menu.

Getting Started

The Getting Started section of the documentation provides an overview of the SDS application and documentation. In this section you can find information about the SDS including a product overview, the system architecture, and functionality. Additionally, this section familiarizes you with common SDS GUI features including user interface elements, main menu options, supported browsers, and common user interface widgets.

OAM

The OAM section of the documentation describes:

- Administration
- Configuration
- Alarms and Events
- Security Log
- Status and Manage
- Measurements

The OAM section of the documentation explains how to use these GUI pages to view and manage the basic operation, administration, and maintenance for the SDS.

Communication Agent

The Communication Agent section of the documentation describes the plug-in included with SDS that includes infrastructure features and services for enabling inter-server communication. This includes:

- Overview
- Configuration
- Maintenance

The Communication Agent GUI menu also lets you monitor the operational status of High-Availability (HA) Services Sub-Resources.

SDS

The SDS section of the documentation describes GUI pages nested under the SDS Menu options. These GUI Menu options allow you to manage configurations as well as Audit, Query and Destination Routing Entities NAI Hosts maintenance. The SDS section of the documentation explains how to perform configuration and maintenance tasks using these GUI pages.

SDS Alarms, KPIs, and Measurements (AKM)

The SDS AKM section provides information relevant to understanding alarms and events that may occur in the SDS application; recovery procedures for addressing alarms and events, as necessary; tasks for viewing alarms and events, generating alarms reports, and viewing and exporting alarms and events history; and information, including any relevant customer actions for addressing unusual measurement values.

Scope and Audience

This guide is intended for trained and qualified system operators and administrators who are responsible for managing an SDS system.

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: Admonishments

	<p>DANGER: (This icon and text indicate the possibility of <i>personal injury</i>.)</p>
	<p>WARNING: (This icon and text indicate the possibility of <i>equipment damage</i>.)</p>
	<p>CAUTION: (This icon and text indicate the possibility of <i>service interruption</i>.)</p>

Customer Care Center

The Tekelec Customer Care Center is your initial point of contact for all product support needs. A representative takes your call or email, creates a Customer Service Request (CSR) and directs your

requests to the Tekelec Technical Assistance Center (TAC). Each CSR includes an individual tracking number. Together with TAC Engineers, the representative will help you resolve your request.

The Customer Care Center is available 24 hours a day, 7 days a week, 365 days a year, and is linked to TAC Engineers around the globe.

Tekelec TAC Engineers are available to provide solutions to your technical questions and issues 7 days a week, 24 hours a day. After a CSR is issued, the TAC Engineer determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, normal support procedures apply. A primary Technical Engineer is assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

Tekelec Technical Assistance Centers are located around the globe in the following locations:

Tekelec - Global

Email (All Regions): support@tekelec.com

- **USA and Canada**

Phone:

1-888-FOR-TKLC or 1-888-367-8552 (toll-free, within continental USA and Canada)

1-919-460-2150 (outside continental USA and Canada)

TAC Regional Support Office Hours:

8:00 a.m. through 5:00 p.m. (GMT minus 5 hours), Monday through Friday, excluding holidays

- **Caribbean and Latin America (CALA)**

Phone:

USA access code +1-800-658-5454, then 1-888-FOR-TKLC or 1-888-367-8552 (toll-free)

TAC Regional Support Office Hours (except Brazil):

10:00 a.m. through 7:00 p.m. (GMT minus 6 hours), Monday through Friday, excluding holidays

- **Argentina**

Phone:

0-800-555-5246 (toll-free)

- **Brazil**

Phone:

0-800-891-4341 (toll-free)

TAC Regional Support Office Hours:

8:00 a.m. through 5:48 p.m. (GMT minus 3 hours), Monday through Friday, excluding holidays

- **Chile**

Phone:

1230-020-555-5468

- **Colombia**

Phone:

01-800-912-0537

- **Dominican Republic**

Phone:

1-888-367-8552

- **Mexico**

Phone:

001-888-367-8552

- **Peru**

Phone:

0800-53-087

- **Puerto Rico**

Phone:

1-888-367-8552 (1-888-FOR-TKLC)

- **Venezuela**

Phone:

0800-176-6497

- **Europe, Middle East, and Africa**

Regional Office Hours:

8:30 a.m. through 5:00 p.m. (GMT), Monday through Friday, excluding holidays

- **Signaling**

Phone:

+44 1784 467 804 (within UK)

- **Software Solutions**

Phone:

+33 3 89 33 54 00

- **Asia**

- **India**

Phone:

+91 124 436 8552 or +91 124 436 8553

TAC Regional Support Office Hours:

10:00 a.m. through 7:00 p.m. (GMT plus 5 1/2 hours), Monday through Saturday, excluding holidays

- **Singapore**

Phone:

+65 6796 2288

TAC Regional Support Office Hours:

9:00 a.m. through 6:00 p.m. (GMT plus 8 hours), Monday through Friday, excluding holidays

Emergency Response

In the event of a critical service situation, emergency response is offered by the Tekelec Customer Care Center 24 hours a day, 7 days a week. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with the Tekelec Customer Care Center.

Related Publications

For information about additional publications that are related to this document, refer to the *Related Publications* document. The *Related Publications* document is published as a part of the *Release Documentation* and is also published as a separate document on the Tekelec Customer Support Site.

Locate Product Documentation on the Customer Support Site

Access to Tekelec's Customer Support site is restricted to current Tekelec customers only. This section describes how to log into the Tekelec Customer Support site and locate a document. Viewing the document requires Adobe Acrobat Reader, which can be downloaded at www.adobe.com.

1. Log into the [Tekelec Customer Support](#) site.

Note: If you have not registered for this new site, click the **Register Here** link. Have your customer number available. The response time for registration requests is 24 to 48 hours.

2. Click the **Product Support** tab.

3. Use the Search field to locate a document by its part number, release number, document name, or document type. The Search field accepts both full and partial entries.
4. Click a subject folder to browse through a list of related files.
5. To download a file to your location, right-click the file name and select **Save Target As**.

Subscriber Database Server (SDS) overview

Subscriber Database Server (SDS) provides the central provisioning of the Full-Address Based Resolution (FABR) data. The SDS, which is deployed geo-redundantly at a Primary and Disaster recovery site, connects with the Query Server and the Data Processor Site Operation Administration and Maintenance (DP SOAM) servers at each Diameter Signaling Router (DSR) site or a standalone DP site to replicate and recover provisioned data to the associated components.

SDS provides the following functionality:

- Automated Performance Data Export (APDE)
- SDS database
- GUI-based provisioning
- Support SOAP over HTTP and XML over TCP as provisioning interfaces
- SQL Interface
- CSV and/or XML format export and import
- Real time replication to:
 - Local standby server at the Primary site
 - Local query server at the Primary site
 - Each server at the Disaster Recovery site
 - Each DP SOAM and DP at up to 24 DSR sites
- DB processor – application hosting the subscriber data for access by the DSR applications
- Automatic NPA Split processing
- Provisioning measurements and KPIs
- Alarms, events, and logs for all interfaces
- DB audit
- Query server
- Backup and restore
- Disaster recovery

The SDS menu options provide the ability to perform SDS-related configuration and maintenance tasks to support the FABR application of the DSR.

Subscriber Database Server (SDS) overview

The available SDS menu options will vary based on the type of server you are logged into and the permissions assigned to your group. If you do not see a menu option you need, make sure you are logged into the appropriate type of server and ask your administrator to make sure the group your user ID belongs to has the appropriate permissions.

Chapter 3

Configuration

Topics:

- [Options configuration.....17](#)
- [Connections configuration.....22](#)
- [NAI Hosts configuration.....25](#)
- [Destinations configuration.....27](#)
- [Destination map configuration.....30](#)
- [Routing entities configuration.....33](#)

The **SDS Configuration** menu options allow you to configure provisioning options and view, insert, edit, and delete provisioning connections, NAI hosts, destinations, and routing entities.

The available database menu options will vary based on the type of server you are logged into and the permissions assigned to your group. If you do not see a menu option you need, make sure you are logged into the appropriate type of server and ask your administrator to make sure the group your user ID belongs to has the appropriate permissions.

Options configuration

The **Options** page allows you to control how the mechanized interface works and controls features such as Import and Export.

Provisioning options

Connections between the application and the provisioning client are set up using the **Connections** page (for more information, see [Connections configuration](#)). The **Options** page allows you to manage configuration options for these connections. Use this page to configure:

- Whether to allow connections and the maximum number of connections allowed
- Number of seconds of inactivity allowed before a connection is timed out
- Whether to log provisioning messages
- Number of seconds allowed between a transaction being committed and becoming durable
- TCP listening ports
- Whether to allow to importing from and exporting to a Remote Host

Import options

The status of provisioning imports can be viewed using the **SDS Maintenance Import** page. For more information, see [Import Status maintenance](#). Provisioning imports from a remote host are configured through the **SDS Configuration Options** page. Use this page to configure:

- Whether provisioning imports are enabled
- Remote host information, including the IP address, username, password, and import directory name
- Whether the import mode is blocking or non-blocking

Export options

Provisioning exports are scheduled through the **SDS Configuration Export** page and the export status can be viewed through the **SDS Maintenance Export Status** page. For more information about this see [Import Status maintenance](#). Use the **SDS Configuration Options** page to configure:

- Whether or not exports are allowed to be copied from this server to the remote host
- Remote host information, including the IP address, username, password, and export directory name
- Whether the export mode is blocking or non-blocking

Options configuration elements

This table describes the fields on the Options page.

Table 2: Options Configuration Elements

Element	Description	Data Input Notes
Display Command Output	If checked, the commands and responses will be displayed on the GUI when provisioning data.	Format: Check box Range: Checked, Unchecked Default: Unchecked
Allow Connections	If checked, incoming provisioning connections are allowed.	Format: Check box Range: Checked, Unchecked Default: Checked
Max Transaction Size	The maximum number of database manipulation commands per transaction.	Format: Digits only Range: 10–1000 Default: 50
Log Provisioning Messages	If checked, all incoming and outgoing provisioning messages will be logged in the command log.	Format: Check box Range: Checked, Unchecked Default: Checked
Transaction Durability Timeout	The number of seconds allowed between a transaction being committed and it becoming durable.	Format: Digits only; seconds Range: 2–3600 Default: 5
Remote Import Enabled	If checked, import files are imported from a remote host.	Format: Check box Range: Checked, Unchecked Default: Unchecked
Remote Import Mode	If set to Non-Blocking , updates are allowed on all provisioning connections while the remote import operation is in progress. If set to Blocking , updates are not allowed.	Format: Pulldown menu Range: Non-Blocking, Blocking Default: Non-Blocking
Remote Import Host IP Address	The IP address of remote import host queried for import files.	Format: Alphanumeric Range: 0–15 characters
Remote Import User	The Username for remote import host user.	Format: Alphanumeric Range: 0–255 characters
Remote Import Password	The password to exchange ssh keys with the remote import host. The password is cleared	Format: Alphanumeric Range: 0–255 characters

Element	Description	Data Input Notes
	from this table once the keys have been exchanged.	
Remote Import Directory	The remote import host directory where the import files are stored.	Format: Alphanumeric Range: 0–255 characters
Export Mode	If set to Non-Blocking , updates are allowed on all connections while the export operation is in progress. If set to Blocking , updates are not allowed.	Format: Pulldown menu Range: Non-Blocking, Blocking Default: Non-Blocking
Remote Export Transfers Enabled	If checked, export files will be copied to the remote export host.	Format: Selection box Range: Selected, Deselected Default: Deselected
Remote Export Host IP Address	The IP address of the remote export host to where export files may be automatically transferred.	Format: Alphanumeric Range: 0–15 characters
Remote Export User	The username for remote export host user.	Format: Alphanumeric Range: 0–255 characters
Remote Export Password	The Password to exchange ssh keys with the remote export host. The password is cleared from this table once the keys have been exchanged.	Format: Alphanumeric Range: 0–255 characters
Remote Export Directory	If export is configured, the export files are transferred to the location on the remote export host.	Format: Alphanumeric Range: 0–255 characters
Remote Audit Receive Window Size	The maximum number of retrieval messages that can be received and buffered by the Provisioning Database Application on the remote system. Once this amount is reached, no more messages will be sent until acknowledgments are received from the remote system.	Format: Digits only Range: 5–2500 Default: 10

Element	Description	Data Input Notes
Remote Audit Send Message Rate	The maximum rate of messages/second in which retrieval messages will be sent to the Provisioning Database Application on the remote systems	Format: Digits only Range: 5–2500 Default: 10
Remote Audit Number Range Limit	The maximum number of records that can be queried per request message.	Format: Digits only Range: 1–10000 Default: 10
PDB Relay Enabled	Whether or not to relay successful incoming provisioning requests to a Provisioning Database Application on a remote system. Note: This feature requires that the Log Provisioning Messages option is enabled.	Format: Selection box Range: Selected, Deselected Default: Deselected
PDB Relay Primary Remote System VIP Address	The VIP address of the primary remote system of the Provisioning Database Application on a remote system. Note: Changes to the TCP listening port do not take affect until PDB Relay is restarted.	Format: Alphanumeric Range: 0-15 characters
PDB Relay Disaster Recovery Remote System VIP Address	The VIP address of the Disaster Recovery remote system on which the Provisioning Database Application is running. Note: Changes to the VIP address do not take affect until PDB Relay is restarted.	Format: Alphanumeric Range: 0-15 characters
PDB Relay Remote System Port	The TCP listening port of the Provisioning Database Application on the remote system. Note: Changes to the VIP address do not take affect until PDB Relay is restarted.	Format: Digits only Range: 0–65535 Default: 5873

Element	Description	Data Input Notes
PDB Relay Receive Window Size	The maximum number of provisioning commands that can be received and buffered by the Provisioning Database Application on the remote system. After this amount is reached, no more commands will be sent until acknowledgments are received from the remote system.	Format: Digits only Range: 5–2500 Default: 10
PDB Relay Send Command Rate	The maximum rate (in commands/second) in which commands will be relayed/sent to the Provisioning Database Application on remote system.	Format: Digits only Range: 5–2500 Default: 200
PDB Relay Timestamp (read-only)	The timestamp of the last provisioning message relayed to the Provisioning Database Application on the remote system.	Format: Digits only Range: 5–2500 Default: 10
XML Interface Port	XML interface TCP (unsecured) listening port. To disable this port, enter 0. If changing this port, the XDS process must be restarted to make change take affect.	Format: Digits only Range: 0–65535 Default: 5875
XML Interface Idle Timeout	The maximum number of seconds that an open connection will remain active without a request being sent and the connection is dropped.	Format: Digits only; seconds Range: 1–86400 Default: 1200
Maximum XML Connections	The maximum number of simultaneous XML interface client connections.	Format: Digits only Range: 1–120 Default: 120
SOAP Interface Port	The SOAP interface TCP listening port. To disable this port, enter 0. If changing this port, the SOAP process must be restarted to make change take affect.	Format: Digits only Range: 0–65535 Default: 5876

Element	Description	Data Input Notes
Maximum SOAP Connections	The maximum number of simultaneous SOAP interface client connections.	Format: Digits only Range: 1–120 Default: 120
SOAP Secure Mode	If set to Secure , the SOAP interface operates in secure mode (using SSL). If set to Unsecure , the SOAP interface operates in unsecure mode (using plain text).	Format: Pulldown menu Range: Secure, Unsecure Default: Unsecure
Maximum Transaction Lifetime	The maximum number of seconds that a transaction will remain open before automatically being rolled back if a commit or rollback is not performed. To disable this timeout, enter 0.	Format: Digits only; seconds Range: 0–3600 Default: 60

Editing options

You can only perform this task when logged into the active SDS server.

1. Select **SDS ► Configuration ► Options**.
The **SDS Configuration Options** page appears.
2. Modify the options you want to change by entering information in the appropriate fields.
For a detailed explanation about the options and valid input for these fields, see [Options configuration elements](#).
3. Click **Apply**.
If field validations succeed, the changes are saved and you remain on the same page. A successful update message appears.

If the page contains any values that are not valid or are out of range, an error message appears.

Connections configuration

The **Connections** page allows you to manage the configuration for servers permitted to establish a connection to the active Primary Provisioning Site's Active SDS Server. Only the servers specified in the Connections list are allowed to remotely connect to the server and execute commands.

Note: Connection options must be set prior to configuring connections. For more information on these options, see [Options configuration](#).

SDS allows up to 120 simultaneous provisioning connections and supports secure and unsecure SOAP connections. While the application is capable of supporting 120 connections, the maximum number of connections allowed can be limited using the **Options** page. For more information about this option, see [Options configuration](#).

From the **Connections** page, you can:

- Filter the list of servers to display only the desired servers.
- View the list of servers allowed to establish a remote connection and each server's permissions.
- Configure the SDS to allow connection requests from remote servers.
- Modify the System ID, IP address, and permissions for listed servers.
- Delete servers from the connections list.

Connections configuration elements

This table describes the fields on the Connections View page.

Table 3: Connections Configuration Elements

Element	Description	Data Input Notes
Action columns	Selectable columns where you can choose to edit or delete selections.	Format: Selectable items.
Filter fields	Pulldown menu of available filters and additional fields to modify the search options.	Format: Selectable list.
System ID	Identification for the system	Format: Alphanumeric Range: 1–8 characters
IP Address	IP address of the client that will connect to SDS	Format: Alphanumeric Range: IPV4 dot-decimal notation (where x ¹ is 1-255 and x ² is 0-255.
Permission	Database permissions for this client	Format: Pulldown list Range: READ_ONLY, READ_WRITE Default: READ_ONLY

Viewing connections

You can perform this task when logged into an SDS or from the DP SOAM GUI.

Select **SDS** ► **Configuration** ► **Connections**.

The **Connections** page appears.

The currently allowed connections are listed in the table.

Inserting connections

You can only perform this task when logged into the Active Primary SDS.

1. Select **SDS ► Configuration ► Connections**.
The **Connections** page appears.
 2. Click **Insert**.
The **SDS Configuration Connections [Insert]** page appears.
 3. Enter a system ID in the **System ID** field.
 4. Enter a unique IP address for the connection in the **IP Address** field.
 5. Select the permissions level for the connection from the **Permissions** pulldown menu.
 - Select **READ_ONLY** to grant read-only access for the client with this connection. This is the default.
 - Select **READ_WRITE** to grant read and write access for the client with this connection.
 6. Perform one of the following:
 - Click **OK** to save the connection and return to the SDS configuration connections page.
 - Click **Apply** to save the connection and remain on this page.
 - Click **Cancel** to return to the **SDS Configuration Connections** page without saving the changes.
- If **OK** or **Apply** is clicked and any of the following conditions exist, an error message appears:
- Any required field is empty; no value was entered or selected
 - The entry in any field is not valid (wrong data type or out of the valid range)
 - The IP Address is not unique; it already exists in the system

Editing connections

You can only perform this task when logged into the Active Primary SDS.

1. Select **SDS ► Configuration ► Connections**.
The **SDS Configuration Connections** page appears.
2. Locate the connection you want to edit and click **Edit**.
The **SDS Configuration Connections [Edit]** page appears.
3. Edit the System ID, IP Address, and/or Permission for the connection.
For more information about these fields, see [Connections configuration elements](#).
4. Perform one of the following:
 - Click **OK** to save the changes and return to the SDS configuration connections page.
 - Click **Apply** to save the changes and remain on this page.

If field validations succeed, the connection is saved.

If **OK** or **Apply** is clicked and any of the following conditions exist, an error message appears:

- If the entry in any field is not valid or are out of range
- If a required field is empty (not entered)
- If the IP Address is not unique

Deleting connections

You can only perform this task when logged into the Active Primary SDS.

1. Select **SDS ► Configuration ► Connections**.
The **SDS Configuration Connections** page appears.
2. Locate the connection you want to delete and click **Delete**.
A popup confirmation window appears.
3. Perform one of the following actions:
 - Click **OK** to delete the connection.
 - Click **Cancel** to cancel the delete function and return to the **SDS Configuration Connections** page.

NAI Hosts configuration

The **NAI Hosts** page allows you to manage the Network Access Identifier (NAI) host systems that are used for provisioning NAI User-associated routing entities.

From the **NAI Hosts** page, you can:

- Filter the list of hosts to display only the desired hosts.
- View the NAI Hosts configured for NAI User.
- Add a NAI Host.
- Delete a NAI Host.

NAI Hosts configuration elements

This table describes the fields on the NAI Hosts View and Insert pages.

Table 4: NAI Hosts Configuration Elements

Element	Description	Data Input Notes
NAI Host	Network Access Identifier hostname	Format: alphanumeric (A-Z, a-z, 0-1) and special characters: period (.), hyphen (-), plus (+), underscore (_), At sign (@), dollar sign (\$), pound or number sign (#), forward slash (/), double quote ("), asterisk (*), exclamation point (!), and colon (:) Range: 1–64 characters

Viewing NAI hosts

You can perform this task when logged into an SDS or from the DP SOAM GUI.

Select **SDS > Configuration > NAI Hosts**.
The **SDS Configuration NAI Hosts** page appears.

The current NAI hosts are listed in the table.

Inserting NAI hosts

You can only perform this task when logged into the Active Primary SDS.

1. Select **SDS > Configuration > NAI Hosts**.
The **SDS Configuration NAI Hosts** page appears.
2. Click **Insert**.
The **SDS Configuration NAI Hosts [Insert]** page appears.
3. Enter a unique hostname in the **NAI Host** field.
4. Perform one of the following:
 - Click **OK** to save the hostname and return to the SDS configuration **NAI Hosts** page.
 - Click **Apply** to save the hostname and remain on this page.
 - Click **Cancel** to return to the **SDS Configuration NAI Hosts** page without saving the changes.

If **OK** or **Apply** is clicked and any of the following conditions exist, an error message appears:

- The required field is empty; no value was entered.
- The entry in the **NAI Host** field contains an invalid character.
- The hostname is not unique; it already exists in the system.

Deleting NAI hosts

You can only perform this task when logged into the Active Primary SDS.

Before performing this task, disable and delete any association that may exist between the NAI host and routing entity (NAI User or Wildcard NAI User).

1. Select **SDS > Configuration > NAI Hosts**.
The **SDS Configuration NAI Hosts** page appears.
2. Locate the NAI host you want to delete and click **Delete**.
A popup confirmation window appears.
3. Perform one of the following actions:
 - Click **OK** to delete the NAI Host.
 - Click **Cancel** to cancel the delete function and return to the **SDS Configuration NAI Hosts** page.

If **OK** is clicked and the following condition exists, an error message appears:

- The NAI Host is in use by a routing entity.

Destinations configuration

The **Destinations** page allows you to manage routing destinations used by routing entities.

From the **SDS Configuration Destination** page, you can perform the following actions:

- Retrieve information for a specific Destination.
- Add a Destination.
- Update the information associated with an existing Destination.
- Delete a Destination.

Destinations configuration elements

This table describes the fields on the Destination Retrieve, Add, Update, and Delete tabs.

Table 5: Destinations Configuration Elements

Element	Description	Data Input Notes
Retrieve and Delete tabs		
Name	Name of the destination	Format: Alphanumeric (A-Z, a-z, 0-1) and special characters: period (.), hyphen (-), plus (+), underscore (_), At sign (@), dollar sign (\$), pound or number sign (#), forward slash (/), double quote ("), asterisk (*), exclamation point (!), and colon (:) Range: 1–32 characters; cannot start with a digit and must contain at least one alpha character.
Add and Update tabs		
Name	Name of the destination	Format: Alphanumeric (A-Z, a-z, 0-1) and special characters: period (.), hyphen (-), plus (+), underscore (_), At sign (@), dollar sign (\$), pound or number sign (#), forward slash (/), double quote ("), asterisk (*), exclamation point (!), and colon (:) Range: 1–32 characters; cannot start with a digit and must

Element	Description	Data Input Notes
		contain at least one alpha character.
Type	Type of destination	Format: Pulldown list <ul style="list-style-type: none"> • IMS HSS • LTE HSS • PCRF • OCF • OFCS • AAA • User defined 1 • User defined 2
FQDN	Unique fully qualified domain name	Format: String consisting of a list of labels separated by dots. A label might contain letters, digits, dash (-), and underscore (_). A label must begin with a letter or underscore, and must end with a letter or digit. Underscore can be used only as the first character. Range: 0-255 characters
Realm	Realm	Format: String consisting of a list of labels separated by dots. A label might contain letters, digits, dash (-), and underscore (_). A label must begin with a letter or underscore, and must end with a letter or digit. Underscore can be used only as the first character. Range: 0-255 characters

Retrieving destinations

You can perform this task when logged into an SDS or from the DP SOAM GUI.

1. Select **SDS** ► **Configuration** ► **Destinations**.
The **SDS Configuration Destinations** page appears.

By default, the **Retrieve** tab is the viewable tab. If not, select the **Retrieve** tab.

2. Enter the destination you want to view in the **Name** field.

Note: For a list of Destinations, select **SDS** ► **Maintenance** ► **Query**; then, select Destination from the **Data** pulldown list.

3. Click **Retrieve**.
The destination appears.

Adding destinations

You can only perform this task when logged into the Active Primary SDS.

1. Select **SDS ► Configuration ► Destinations**.
The **SDS Configuration Destinations** page appears.
2. Select the **Add** tab.
The **Add** tab appears.
3. Enter a unique name in the **Name** field.
4. Select the type of destination from the **Type** pulldown list.
5. Enter a fully-qualified domain name (FQDN) in the **FQDN** field.
6. Enter the realm in the **Realm** field.
7. Click **Add** to save the destination.

When **Add** is clicked and any of the following conditions exist, an error message appears:

- The entry in any field is not valid (wrong data type).
- The Destination name is not unique; it already exists in the system.

Updating destinations

You can only perform this task when logged into the Active Primary SDS.

1. Select **SDS ► Configuration ► Destinations**.
The **SDS Configuration Destinations** page appears.
2. Select the **Update** tab.
The **Update** tab appears.
3. Enter the destination you want to update in the **Name** field. Click **Lookup**.
The **Update** tab appears. with the destination information.
4. Edit the **FQDN** and/or **Realm** fields.
Use the keyword *none* to clear the attribute.

For more information about these fields, see [Destinations configuration elements](#).

Important: When updating a destination, you are permitted to leave both the **FQDN** and **Realm** empty. This action is permitted and the destination is retained despite having no data for these attributes.

5. Click **Update** to save the changes to the destination.
When **Update** is clicked and any of the following conditions exist, an error message appears:
 - The entry in any field is not valid (wrong data type).
 - The Destination and its associated change exists.

Deleting destinations

You can only perform this task when logged into the Active Primary SDS.

A Destination cannot be deleted while any routing entity, NAI/Wildcard User, or Destination remains associated with them. Before you perform this task, disable and delete any connections that use the Destination

1. Select **SDS ► Configuration ► Destinations**.
The **SDS Configuration Destinations** page appears.
2. Select the **Delete** tab.
3. Enter a valid destination you want to delete in the **Name** field. Click **Delete**.
A popup confirmation window appears.
4. Perform one of the following actions:
 - Click **OK** to delete the destination.
 - Click **Cancel** to cancel the delete function and return to the **SDS Configuration Destinations** page.

If **OK** is clicked and the following condition exists, an error message appears:

- No updates were made to the database.
- Field Name contains invalid character(s).
- Object currently in use; destination is used by a route.
- Object currently in use; destination is used by a destination map.

Destination map configuration

The **Destination map** page allows you to add, modify, or delete additional data on an existing Destination.

From the **Destination Map** page, you can associate a destination to a HLR Router Network entity.

Destination map configuration elements

The **SDS -> Configuration -> Destination Map** page displays information in a tabular format. The following table describes elements on this page.

Table 6: Destination Map Elements

Element	Description	Data Input Notes
Action columns	Selectable columns where you can choose to edit or delete selections.	Format: Selectable items.
Filter fields	Pulldown menu of available filters and additional fields to modify the search options.	Format: Selectable list.

Element	Description	Data Input Notes
Destination	Destination field.	Format: Alphanumeric Range: 1–32 characters
Network Entity	The E.164 address of a service node used by HLR Router.	Format: Numeric Range: 8–15 characters

Viewing Destination Map connections

Use this page to view the list of Destination Map entries.

Select **SDS** ► **Configuration** ► **Destination Map**.
The **Destination Map** page appears.

The current destination maps are listed in the destination map table.

Inserting Destination Maps

Use this page to manually add a destination map to the database. A Destination and Network Entity must be provided when adding a Destination Map entry. The Destination value must match a name of an existing Destination entry. The **OK** and **Apply** buttons are disabled until a character is entered into either the Destination or Network Entity field.

Note: You can only perform this task when logged into the Active Primary SDS.

1. Select **SDS** ► **Configuration** ► **Destination Map**.
The **Destination Map** page appears.
2. Click **Insert**.
The **Destination Map [Insert]** page appears.
3. Enter a Destination name in the **Destination** field. The name must match a Destination name that has already been entered into the database.
4. Enter a E.164 address for the server node for the **Network Entity** in the Network Entity field.
5. Perform one of the following:
 - Click **OK** to save the destination map and return to the **Destinations Map** page.
 - Click **Apply** to save the destination map and remain on this page.
 - Click **Cancel** to return to the **Destinations Map** page without saving the changes.

If **OK** or **Apply** is clicked and any of the following conditions exist, an error message appears:

- Missing required information in the **Destination** field.
- Missing required information in the **Network Entity** field.
- Invalid characters in the **Destination** field.
- Only digits are allowed in the **Network Entity** field.
- The **Network Entity** field must contain at least eight digits.
- Destination not found.
- The Destination's type must be IMSHSS to have a Destination Map entry.

Editing Destination Maps

Use this page to manually change an existing destination map in the database. The **OK** and **Apply** buttons are disabled until a character is entered into either the Destination or Network Entity field.

You can only perform this task when logged into the Active Primary SDS.

Note: A service node must be provided when modifying a destination map.

1. Select **SDS ► Configuration ► Destination Map**.
The **Destination Map** page appears.
2. Locate the map you want to edit and click **Edit**.
The **Destination Map [Edit]** page appears.
3. Edit the E.164 address for the server node in the **Network Entity** field.
4. Perform one of the following:
 - Click **OK** to save the destination map and return to the **Destination Map** page.
 - Click **Apply** to save the destination map and remain on this page.
 - Click **Cancel** to return to the **Destination Map** page without saving the changes.

If **OK** or **Apply** is clicked and any of the following conditions exist, an error message appears:

- Missing required information in the **Network Entity** field.
- Only digits are allowed in the **Network Entity** field.
- The **Network Entity** field must contain eight digits.

Deleting Destination Maps

This page allows you to manually delete a destination map from the database. A Destination Map cannot be deleted while any IMSI or MSISDN routing entities remain associated with the destination.

Note: You can only perform this task when logged into the Active Primary SDS.

1. Select **SDS ► Configuration ► Destination Map**.
The **Destination Map** page appears.
2. Locate the map you want to delete and click **Delete**.
A popup confirmation window appears.
3. Perform one of the following actions:
 - Click **OK** to delete the map.
 - Click **Cancel** to cancel the delete function and return to the **Destination Map** page.

If **OK** is clicked and any of the following conditions exist, and error message appears:

- Destination is in use by a route.

Routing entities configuration

The **Routing Entities** page allows you to manage the supported routing entities:

- IMSI
- MSISDN
- NAI User
- Wildcard NAI User Prefix

Note: A routing entity can be a User Identity or an IP Address associated with the User Equipment (IPv4 or IPv6 address).

From the **SDS Configuration Routing Entities** page, you can perform the following actions:

- Retrieve information for a specific Routing Entity.
- Add a supported Routing Entity.
- Update the information associated with an existing Routing Entity.
- Delete a Routing Entity.

Routing entities configuration elements

This table describes the fields on the Routing Entities Retrieve, Add, Update, and Delete tabs.

Table 7: Routing Entities Configuration Elements

Element	Description	Data Input Notes
Retrieve and Delete tabs		
Type	Type of supported routing entity	Format: pulldown list Range: MSISDN, ISMI, NAI User, Wildcard NAI User
Address (WC NAI User Only)	The routing entity address	Format: alphanumeric and underscore Range: Depends on Type <ul style="list-style-type: none"> • MSISDN: 8–15 digits • IMSI: 10–15 digits • NAI User: 1–64 characters
Address Prefix (WC NAI User Only)	The routing entity address	Wildcard NAI User: 1–64 characters
NAI Host	NAI Host; available only when NAI User or Wildcard NAI User is selected as the Type .	Format: pulldown list Range: available NAI Hosts
Add and Update tabs		

Element	Description	Data Input Notes
Type	Type of supported routing entity	Format: pulldown list Range: MSISDN, ISMI, NAI User, Wildcard NAI User
Address	The routing entity address	Format: alphanumeric and underscore Range: Depends on Type <ul style="list-style-type: none"> • MSISDN: 8–15 digits • IMSI: 10–15 digits • NAI User: 1–64 characters
Address Prefix (available for the WC NAI User selection only)	The routing entity address	Wildcard NAI User: 1–64 characters
NAI Host (available for the NAI User selection only)	NAI Host; available only when NAI User or Wildcard NAI User is selected as the Type .	Format: pulldown list Range: available NAI Hosts
IMS HSS (available on the Add tab only)	IMS HSS destination	Format: pulldown list Range: available IMS HSS destinations
LTE HSS (available on the Add tab only)	LTE HSS destination	Format: pulldown list Range: available LTE HSS destination
PCRF (available on the Add tab only)	IMS HSS destination	Format: pulldown list Range: available PCRF destinations
OCS (available on the Add tab only)	IMS HSS destination	Format: pulldown list Range: available OCS destinations
OfCS (available on the Add tab only)	IMS HSS destination	Format: pulldown list Range: available OfCS destinations
AAA (available on the Add tab only)	IMS HSS destination	Format: pulldown list Range: available AAA destinations
User defined 1 (available on the Add tab only)	IMS HSS destination	Format: pulldown list Range: available User defined 1 destinations

Element	Description	Data Input Notes
User defined 2 (available on the Add tab only)	IMS HSS destination	Format: pulldown list Range: available User defined 2 destinations

Retrieving routing entities

You can perform this task when logged into an SDS or from the DP SOAM GUI.

Before performing this task, make sure that Destinations and NAI Hosts have been configured.

1. Select **SDS** ► **Configuration** ► **Routing Entities**.

The **SDS Configuration Routing Entities** page appears.

By default, the **Retrieve** tab is the viewable tab. If not, select the **Retrieve** tab.

2. Select the type of routing entity from the **Type** pulldown list.
3. Enter the route identifier for the routing entity in the **Address** or **Address Prefix** field.

Note: The **Address** or **Address Prefix** field requirements vary depending on the type of routing entity. For more information on this field, see [Routing entities configuration elements](#).

4. If NAI User or Wildcard NAI User is selected as the **Type**, select a NAI host from the **NAI Host** pulldown list.
5. Click **Retrieve**.

When **Retrieve** is clicked and the following condition exists, an error message appears:

- If either MSISDN or IMSI was selected as the **Type**, and a non-digit character was entered.
- Field Address contains invalid characters.

Adding routing entities

You can only perform this task when logged into the Active Primary SDS.

Before performing this task, make sure that Destinations and NAI Hosts have been configured.

1. Select **SDS** ► **Configuration** ► **Routing Entities**.

The **SDS Configuration Routing Entities** page appears.

2. Select the **Add** tab.
3. Select the type of routing entity from the **Type** pulldown list.
4. Enter the route identifier for the routing entity in the **Address** or **Address Prefix** field.

Note: The **Address** or **Address Prefix** field requirements vary depending on the type of routing entity. For more information on this field, see [Routing entities configuration elements](#).

5. If NAI User or Wildcard NAI User is selected as the **Type**, select a NAI host from the **NAI Host** pulldown list.
6. Select the associated destination(s) from the applicable destination(s) pulldown list.

At least one destination must be selected, although a destination can be selected for each of the destination types.

7. Click **Add**.

When **Add** is clicked and any of the following conditions exist, an error message appears:

- Either MSISDN or IMSI was selected as the **Type** and a non-digit character was entered.
- At least one destination was not selected.
- Field Address contains invalid characters.

Updating routing entities

You can only perform this task when logged into the Active Primary SDS.

1. Select **SDS ► Configuration ► Routing Entities**.

The **SDS Configuration Routing Entities** page appears.

2. Select the **Update** tab.

3. Select the type of routing entity from the **Type** pulldown list.

4. Enter the route identifier for the routing entity in the **Address** or **Address Prefix** field.

Note: The **Address** or **Address Prefix** field requirements vary depending on the type of routing entity. For more information on this field, see [Routing entities configuration elements](#).

5. If NAI User or Wildcard NAI User is selected as the **Type**, select a NAI host from the **NAI Host** pulldown list.

6. Click **Lookup**.

Note: If the route was not located during the **Lookup**, an error message appears.

The **Update** tab appears with the routing entity information.

7. Edit the appropriate destination(s).

For more information about these fields, see [Routing entities configuration elements](#).

Important: Although at least one destination is required when *adding* a routing entity, there is no minimum requirement for destinations when *updating* the routing entity. For example, all of the destinations could possibly be set to NONE.

8. Click **Update**.

Deleting routing entities

You can only perform this task when logged into the Active Primary SDS.

1. Select **SDS ► Configuration ► Routing Entities**.

The **SDS Configuration Routing Entities** page appears.

2. Select the **Delete** tab.

3. Select the type of routing entity from the **Type** pulldown list.

4. Enter the route identifier for the routing entity in the **Address** or **Address Prefix** field.

Note: The **Address** or **Address Prefix** field requirements vary depending on the type of routing entity. For more information about this field, see [Routing entities configuration elements](#).

5. If NAI User or Wildcard NAI User is selected as the **Type**, select a NAI host from the **NAI Host** pulldown list.
6. Click **Delete**.
A popup confirmation window appears.
7. Perform one of the following actions:
 - Click **OK** to delete the connection.
 - Click **Cancel** to cancel the delete function and return to the **SDS Configuration Routing Entities** page.

If **OK** is clicked and any of the following conditions exist, an error message appears:

- Either MSISDN or IMSI was selected as the **Type** and a non-digit character was entered in the **Route** field
- The route identifier was not found.
- Field Address contains invalid characters.

Topics:

- [Connections maintenance39](#)
- [Command Log maintenance.....41](#)
- [Relay Exception Log.....42](#)
- [Import Status maintenance.....44](#)
- [Export maintenance.....46](#)
- [Audit53](#)
- [Remote Audit57](#)
- [Query61](#)
- [NPA Splits maintenance.....65](#)

The **Maintenance** menu options allow you to query and audit data, view up-to-date status of the database and various features, initiate import and exports.

From the maintenance menu on an SDS you can:

- Perform database audits
- Query the database for specified MSISDN, IMSI, NAI user, or wildcard NAI user ranges
- View provisioning connections, command logs, and the status of imports and exports
- Configure and manage NPA Splits

When you are logged into an DP SOAM you cannot request an audit, update splits, or schedule an export on the DP SOMA GUI.

The available menu options will vary based on the type of server you are logged into and the permissions assigned to your group. If you do not see a menu option you need, please make sure you are logged into the appropriate type of server and ask your administrator to make sure the group your user ID belongs to has the appropriate permissions.

The **SDS Maintenance** pages provide maintenance information related to provisioning connections and data. With this page you can monitor provisioning connections; view every provisioning message exchanged between provisioning systems in the command log, view the status of imports and exports; open import and export files and import result logs.

All provisioning maintenance tasks are only available when logged into an SDS.

Connections maintenance

The SDS -> Maintenance -> Connections page allows you to view the “currently in-use” external connections. A list of all provisioning connections established to the system can be viewed. A display filter can be applied for a specified search. The information is displayed in tabular format.

Any local connections (including the one from the GUI itself) are not included.

Connections maintenance elements

The SDS -> Maintenance -> Connections page displays information in a tabular format. [Table 8: Connections Maintenance Elements](#) describes elements on the SDS -> Maintenance -> Connections page.

Table 8: Connections Maintenance Elements

Field	Definition	Data Notes
Timestamp	Time the connection was established	Format: Year-Month-Day Hour-Minute-Second
CID	Connection ID	N/A
Remote IP	IP address for the remote client	Format: Valid IP address
Remote Port	Port used for the remote client connection	Format: Valid port number
Version	Version of API this client application is using	Default: 1.0
Cnx Manager	Connection manager	Options: Pdba, Xds, XmlImport, XmlExport, PdbRelay, PdbAudit
Txn Mode	Database transaction mode	Range: <ul style="list-style-type: none"> normal: All updates must be sent inside a transaction explicitly begun and ended by begin_txn and end_txn/abort_txn requests respectively. single: Transactions are implicitly begun and ended for individual update requests Default: normal
Idle Timeout	Number of minutes the connection can be idle before it is automatically timed out.	Range: <ul style="list-style-type: none"> 0 (the connection is never terminated) 1 - 44640 minutes

Field	Definition	Data Notes
		Default: 0

Viewing connections status

Use this task to view a list of information of all provisioning connections established to the system. The listing of connections may be filtered.

1. Select **SDS ► Maintenance ► Connections**.

The **SDS Maintenance Connections** page appears. All provisioning connections are displayed in tabular form. The fields are described in [Connections maintenance elements](#).

2. Select the category by which to perform the filtering.

Table 9: Connection Status filtering categories

Category	Description
Timestamp	Time the connection was established.
CID	The Connection ID to filter on.
Remote IP	IP address for the remote client.
Remote Port	Port used for the remote client connection.
Version	Version of API this client application is using.
Txn Mode	Database transaction mode.
Idle Timeout	Number of minutes the connection can be idle before it is automatically timed out.

3. Choose the filtering operator.

Table 10: Connection Status filtering operators

Operator	Description
=	Is equal to
!=	Is not equal to
>	Is greater than
>=	Is equal to or greater than
<	Is less than
<=	Is equal to or less than
Like	Is Like (wildcard is * character)
Is Null	has no entry (is zero)

4. Enter the target character string to filter on in the text box.
5. Use Auto Refresh to select the time interval for the status to be refreshed.

Table 11: Connection status refresh time

Time	Description
15	15 seconds
30	30 seconds
Off	Off (default)

6. Click **Go** to show results.

Command Log maintenance

The **SDS -> Maintenance -> Command Log** page shows a table that contains a history of commands and their responses. This table shows the **Timestamp**, **System ID**, **CID**, and the **Text** of the commands received from both remote and local connections, including the GUI.

Every provisioning message exchanged between provisioning systems is written to the command log and is stored for up to seven days.

Command Log maintenance elements

The **SDS -> Maintenance -> Command Log** page displays information in a tabular format. This table describes elements on the **SDS -> Maintenance -> Command Log** page.

Table 12: Command Log Maintenance Elements

Element	Description
Timestamp	Date and time the command was logged
System ID	System identifier of the originating client
CID	Client connection identifier
Text	Exact command and response message

Viewing maintenance command logs history

Use this task to view a list of information of a history of commands and their responses. The history is displayed as a table that shows the **Timestamp**, **System ID**, **CID**, and the **Text** of the commands received from both remote and local connections, including the GUI. The history may be filtered by category.

Note: You can use **Max entries to display** to control the total number of entries displayed on the page.

1. Select **SDS ► Maintenance ► Command Log**.

The **SDS Maintenance Command Log** page appears.

2. Select the category by which to perform the filtering.

Table 13: Command Log filtering categories

Category	Description
None	Show all commands
System ID equal to...	A hidden text box becomes visible for you to enter the System ID to filter on.
CID equal to...	A hidden text box becomes visible for you to enter the Connection ID to filter on.
Log text contains...	A hidden text box becomes visible for you to enter one or more keywords to filter on.
Error responses	Shows all commands with error responses.
Time range...	When selected, hidden select boxes for "From" and "To" times become visible for you to enter the time range to filter on.

3. Click **Display** to show results.

When results are filtered, the highlighted text **RESULTS FILTERED** is displayed at the bottom of the results.

Relay Exception Log

The **SDS -> Maintenance -> Relay Exception Log** page shows a table that contains all types of exceptions (unexpected results) that are found while processing SDS to HLRR relay or export functionality. Consequently, all fields do not always contain data. All entries in the Relay Exception Log contain enough data so that you can determine what SDS data caused the exception.

Ideally, the Relay Exception Log would be empty, which means that SDS has all of the data required to create an HLRR provisioning command and all of the required Network Entities are provisioned for HLR Router. Because the most likely cause of an error would be associated with relaying new provisioning commands to HLRR, the Relay Exception Log displays column headings for exceptions created by `pdbrelay`. Deviations for other creators are described below:

- If no command is relayed to HLRR, the Derived Relay Request value will be None .
- If the Creator value is not equal to `pdbrelay`, the Derived Relay Request value from the SDS Command Log section will be blank.

Relay Exception Log maintenance elements

The **SDS -> Maintenance -> Relay Exception Log** page displays information in a tabular format. This table contains a list of exceptions found while processing data that should be relayed from SDS to HLRR.

Note: Display limit must be a numeric integer greater than zero.

The following table describes elements on the **SDS -> Maintenance -> Relay Exception Log** page.

Table 14: Exception Log Maintenance Elements

Element	Description
Timestamp	Date and time when the exception occurred
Seq Num	Exception sequence number
Creator	Name of process that created the exception
Reason	Reason that the exception was created
Derived Relay Request	Command created and relayed to HLR Router
Command	Command text from the SDS Command Log
Seq Num	Sequence number form the SDS Command Log
Timestamp	Timestamp from the SDS Command Log

Viewing exception logs history

Use this task to view a list of information of a history of commands and their responses. The history is displayed as a table that shows the **Timestamp**, **System ID**, **CID**, and the **Text** of the commands received from both remote and local connections, including the GUI. The history may be filtered by category.

Note: You can use **Max entries to display** to control the total number of entries displayed on the page.

1. Select **SDS ► Maintenance ► Relay Exception Log**.
The **SDS Relay Exception Log** page appears.
2. Select the category by which to perform the filtering.

Table 15: Relay Exception Log filtering categories

Category	Description
None	Show all commands
Exception Seq Num equal to...	A hidden text box becomes visible for you to enter the Exception Sequence Number to filter on.
Exception Creator equal to...	A hidden text box becomes visible for you to enter the Exception Creator to filter on.
Exception Reason text contains...	A hidden text box becomes visible for you to enter one or more Exception Reasons keywords to filter on.
Exception Time range...	When selected, hidden select boxes for "From" and "To" times become visible for you to enter the time range to filter on.
Command text contains...	A hidden text box becomes visible for you to enter Command text to filter on.

3. Click **Display** to show results.

When results are filtered, the highlighted text **RESULTS FILTERED** is displayed at the bottom of the results.

Import Status maintenance

Allows an operator to view the status of all Imports.

Data can be imported from a provisioning import file to add new, or update existing, data in the database. Imports are not scheduled through the user interface but import settings are configured with the provisioning options page.

Import files that are placed in a specific location on a remote server (**Remote Import Directory**) are detected within five minutes and automatically downloaded via SSH File Transfer Protocol (SFTP) to the file management storage area. For a file to be imported, it must:

- be properly named following the naming convention. For more information see the SDS Administration Manual.
- have been placed in the remote directory after the time when provisioning import last ran
- must not have been previously imported. A file that has already been imported into the local directory will not be imported again, even if its status is Failed.

Note: To import a previously Failed file, correct the file as necessary, rename the file, and then place the renamed file in the remote directory.

Once fully downloaded, each file is automatically imported into the Provisioning Database sequentially in the order in which their download completed. The provisioning import file is an ASCII text file that contains a series of database manipulation requests in provisioning format.

The **SDS Maintenance Import Status** page allows you to view the status of provisioning imports. Import records with a status of Completed or Failed can be deleted from this table.

Import Status maintenance elements

The **SDS -> Maintenance -> Import Status** page displays information in a tabular format. [Table 16: Import Status Maintenance Elements](#) describes elements on the **SDS -> Maintenance -> Import Status** page.

Table 16: Import Status Maintenance Elements

Field	Description
Action	Allows user to delete import file entries.
Import File	Name of import file
Time Queued	Time the import was queued
Time Started	Time the import started
Time Completed	Time the import completed

Field	Description
Progress	Percentage of import progress
Result Log	Name/heading of result log
Pass Count	The number of successful import commands
Fail Count	The number of unsuccessful import commands
Status	Status of the import

Viewing import files

This task allows you to view the status of all Imports. Imports are not scheduled through the GUI. They are initiated by the presence of a file placed in the Remote Import Directory.

- If the filename in the **Import File** or **Result Log** column exceeds 24 characters, it is truncated at 22 characters and the characters “...” are appended to the end of the truncated string to signify that the filename was truncated.
- The filenames in both the **Import File** or **Result Log** columns are hyperlinks. You can click on the links to view the files as text or to save them locally.
- You cannot edit an imported file using this form.
- You may delete an Import Status record if the **Status** is **Completed**, or **Failed**.

1. Select **SDS ► Maintenance ► Import Status**.

The **SDS Maintenance Import Status** page appears. All provisioning connections are displayed in tabular form. The display fields are described in [Import Status maintenance elements](#).

2. Select the category by which to perform the filtering.

Table 17: Import Status filtering categories

Category	Description
Time Queued	Time the import was queued
Time Started	Time the import started
Time Completed	Time the import completed
Progress	Percentage of import progress
Pass Count	The number of successful import commands
Fail Count	The number of unsuccessful import commands
Status	Status of the import

3. Choose the filtering operator.

Table 18: Connection Status filtering operators

Operator	Description
=	Is equal to
!=	Is not equal to
>	Is greater than
>=	Is equal to or greater than
<	Is less than
<=	Is equal to or less than
Like	Is Like (wildcard is * character)
Is Null	has no entry (is zero)

4. Enter the target character string to filter on in the text box.
5. Use Auto Refresh to select the time interval for the status to be refreshed.

Table 19: Connection status refresh time

Time	Description
15	15 seconds
30	30 seconds
Off	Off (default)

6. Click **Go** to show results.
7. To delete an import record, click on the associated **Delete** link.

Note: The import record can only be deleted if the **Status** is **Completed**, or **Failed**.

A confirmation dialog to complete the delete action appears. For all other imports, the **Delete** action is inactive (grayed-out).

Export maintenance

Provisioning data can be exported to an ASCII file in either XML or CVS format using the application user interface. The **SDS Maintenance Export** pages allow you to view the status, progress, and data count information for scheduled provisioning exports. You may use exported records to do data manipulation of subscriber data.

Note: Export is a time consuming operation recommended to be scheduled during off-peak hours. SDS operators can schedule one-time or recurring exports.

Exported data may also be offloaded to a remote server. The exported text file is also available to be downloaded from the 'file transfer area'. Export is a periodic task. Any changes done to export table shall take effect on next export period. The following is the functionality of Export:

- You can configure and schedule data export on a daily, weekly or monthly basis.
- The exported files will be sFTPed or transferred via SSH to a server configured on SDS.
- Data can be exported to a file in XML commands or CSV format.
- You can export subscriber data (in XML or CSV format) as shown in [Table 20: Interfaces for Subscriber Data Types](#):

Table 20: Interfaces for Subscriber Data Types

Subscriber Data Type	GUI (add, change, delete and query)	SOAP and/or XML (add, change, delete and query)	XML Export and Import	CSV Export and Import	SQL Query (from Query Server)
MSISDN	yes	yes	yes	yes	yes
IMSI	yes	yes	yes	yes	yes
NAI User	yes	yes	yes	yes	yes
Wildcard NAI User	yes	no	no	yes	yes
NAI Host	yes	no	no	yes	yes
Destination	yes	no	no	yes	yes

Schedule

The **SDS -> Maintenance -> Export -> Schedule** page displays information in a tabular format for all exports scheduled for this system.

Export Schedule maintenance elements

[Table 21: Export Schedule Maintenance Elements](#) describes elements on the **SDS -> Maintenance -> Export -> Schedule** page.

Table 21: Export Schedule Maintenance Elements

Field	Description
Action	Edit or Delete scheduled export
Identifier	Name of export file
File format	Format of the export file (CSV or XML)
Export Data	Type of data to export
First Export	The first time this export is scheduled to run
Next Export	The next time this export is scheduled to run
Repeat	How often to repeat export
Comment	Purpose of export

Additionally, you can insert an export schedule by clicking on the **[Insert]** button on the page.

Viewing export schedule

The **SDS -> Maintenance -> Export -> Schedule** page shows the scheduled exports for this system.

1. Select **SDS -> Maintenance -> Export -> Schedule**.

The **SDS Maintenance Export Schedule** page appears. All exports are displayed in tabular form. The display fields are described in [Export Schedule maintenance elements](#).

- Click on the **[Insert]** button, located on the bottom of the page, to insert a new export schedule.
- Click **Edit** in the **Action** column on an export record to edit that export.
- Click **Delete** in the **Action** column on an export record to delete that export.

2. Select the category by which to perform the filtering.

Table 22: Export Schedule filtering categories

Field	Description
Identifier	Name of export file
File format	Format of the export file (CSV or XML)
Export Data	Type of data to export
First Export	The first time this export is scheduled to run
Next Export	The next time this export is scheduled to run
Repeat	How often to repeat export
Comment	Purpose of export

3. Choose the filtering operator.

Table 23: Export Schedule filtering operators

Operator	Description
=	Is equal to
!=	Is not equal to
>	Is greather than
>=	Is equal to or greater than
<	Is less than
<=	Is equal to or less than
Like	Is Like (wildcard is * character)
Is Null	has no entry (is zero)

4. Enter the target character string to filter on in the text box.

- Click **Go** to show results.

Inserting an export schedule

The **SDS -> Maintenance -> Export -> Schedule [Insert]** page allows you to create an export for this system.

The field or fields highlighted in yellow are keys and must be unique within this table in order to be successful. Fields marked with a red asterisk (*) require a value.

- Select **SDS -> Maintenance -> Export -> Schedule**.

The **SDS Maintenance Export Schedule** page appears.

- Click on the **[Insert]** button located on the bottom of the page.

The **SDS Maintenance Insert Export Schedule** page appears.

- Enter an identifying string for the scheduled export in the **Identifier** text box.

The identifier must be 4 to 12 characters.

- Use the radio buttons **csv** or **xml** to choose the **File Format** of the export file.

- From the **Export Data** drop down list, select the type of data to be exported.

The available type data selections are csv or xml file format.

Table 24: Export Data Types

Type of Data	csv Format	xml Format
All	all formats listed	all formats listed
MSISDN	X	X
IMSI	X	X
NAI User	X	X
Wildcard NAI User	X	
NAI Host	X	
Destinations	X	

- Use the appropriate drop down list to select the initial date at which this export should run.
- Use the appropriate drop down list to select the initial time at which this export should run.
- Use the appropriate drop down list to select how often this export should be repeated.
- In the Comment text box, enter text that may be used to describe the purpose of this export.

Note: You can enter up to 255 characters for a comment.

- Perform one of these actions:

- Click **OK**. If field validations succeed, the new export is saved and the previous page appears. If the page contains any values that are not valid, or if a required field is empty, an error message appears.

- Click **Apply**. If field validations succeed, the new export is saved and you remain on the same page.
- Click **Cancel** to abort changes on this page and return to the previous page.

Editing an export schedule

The **SDS -> Maintenance -> Export -> Schedule [Edit]** page allows you to manually change an existing export job by editing an entry in the Export Schedule.

The field or fields highlighted in yellow are keys and must be unique within this table in order to be successful. Fields marked with a red asterisk (*) require a value.

1. Select SDS -> Maintenance -> Export -> Schedule.

The **SDS Maintenance Export Schedule** page appears.

2. Click Edit in the Action column of the export record to be edited.

The **SDS Maintenance Edit Export Schedule** page appears.

3. Enter an identifying string for the scheduled export in the Identifier text box.

The identifier must be 4 to 12 characters.

4. Use the radio buttons csv or xml to choose the File Format of the export file.

5. From the Export Data drop down list, select the type of data to be exported.

The available type data selections are csv and xml file format.

Table 25: Export Data Types

Type of Data	csv Format	xml Format
All	all formats listed	all formats listed
MSISDN	X	X
IMSI	X	X
NAI User	X	X
Wildcard NAI User	X	
NAI Host	X	
Destinations	X	

6. Use the appropriate drop down list to select the initial date at which this export should run.
7. Use the appropriate drop down list to select the initial time at which this export should run.
8. Use the appropriate drop down list to select how often this export should be repeated.
9. In the Comment text box, enter text that may be used to describe the purpose of this export.

Note: You can enter up to 255 characters for a comment.

10. Perform one of these actions:

- Click **OK** . If field validations succeed, the new export is saved and the previous page appears. If the page contains any values that are not valid, or if a required field is empty, an error message appears.
- Click **Apply**. If field validations succeed, the new export is saved and you remain on the same page.
- Click **Cancel** to abort changes on this page and return to the previous page.

Deleting an export schedule

The **SDS -> Maintenance -> Export -> Schedule [Delete]** page allows you to manually delete an export job by deleting an entry from the Export Schedule Table.

1. Select **SDS -> Maintenance -> Export -> Schedule**.

The **SDS Maintenance Export Schedule** page appears.

2. Click **Delete** in the **Action** column of the export record to be deleted.

A confirmation dialogue box opens, "Are you sure you want to delete this row?"

- Click **OK** to confirm the action to delete the export record and return to the **SDS -> Maintenance -> Export -> Schedule** page.
- Click **Cancel** to abort the delete action and return to the **SDS -> Maintenance -> Export -> Schedule** page.

Status

The **SDS -> Maintenance -> Export -> Status** page displays information in a tabular format and shows all in-progress and completed scheduled exports in this system.

Export Status maintenance elements

[Table 26: Export Status Maintenance Elements](#) describes elements on the **SDS -> Maintenance -> Export -> Status** page.

Table 26: Export Status Maintenance Elements

Field	Description
Export File	Name of export file
Time Queued	Time the export was queued
Time Started	Time the export started
Time Completed	Time the export completed
MSISDNs Count	Number of MSISDNs exported
IMSI Count	Number of IMSIs exported
NAIs Count	Number of NAIs exported
Wildcard NAIs	Number of Wildcard NAIs exported

Field	Description
Destinations Count	Number of Destinations exported
NAI Hosts Count	Number of NAI Hosts exported
Status	Status of export
Comment	Descriptive text about export. This field is optional, so it may be blank.

Viewing export status

The **SDS -> Maintenance -> Export -> Status** page shows the status of all in-progress and completed scheduled exports for this system.

- If the filename in the **Export File** column exceeds 24 characters, it is truncated at 22 characters and the characters “...” are appended to the end of the truncated string to signify that the filename was truncated.
- The filenames in the **Export File** column are hyperlinks. You can click on the links to view the files as text or to save them locally.
- You can not modify or delete an export record using this form.
- Records are automatically removed after 7 days.

1. Select **SDS -> Maintenance -> Export -> Status**.

The **SDS Maintenance Export Status** page appears. All exports are displayed in tabular form. The display fields are described in [Export Status maintenance elements](#).

2. Select the category by which to perform the filtering.

Table 27: Export Status filtering categories

Category	Description
Time Queued	Time the import was queued
Time Started	Time the import started
Time Completed	Time the import completed
MSISDNs	Number of MSISDNs exported
IMSI	Number of IMSIs exported
NAIs	Number of NAIs exported
Wildcard NAIs	Number of Wildcard NAIs exported
Destinations	Number of Destinations exported
NAI Hosts	Number of NAI Hosts exported
Status	Status of export
Comment	Descriptive text about export. This field is optional, so it may be blank.

3. Choose the filtering operator.

Table 28: Export Status filtering operators

Operator	Description
=	Is equal to
!=	Is not equal to
>	Is greater than
>=	Is equal to or greater than
<	Is less than
<=	Is equal to or less than
Like	Is Like (wildcard is * character)
Is Null	has no entry (is zero)

4. Enter the target character string to filter on in the text box.
5. Use Auto Refresh to select the time interval for the status to be refreshed.

Table 29: Export status refresh time

Time	Description
15	15 seconds
30	30 seconds
Off	Off (default)

6. Click **Go** to show results.

Audit

The **SDS Maintenance Audit** menu option allows you to view the status of the database audits and to request a site-wide database audit of a specified subset of provisioning data through the use of the following tabs:

- The **Audit Status** tab allows you to view all pending, completed, and failed database audits.
- The **Audit Request** tab allows you to request a site-wide database audit.

Since each node is responsible for managing its own resources, some nodes may decide to delay or cancel the requested audit in order to maintain sufficient resources to process signaling traffic.

- Manual audit results can be viewed on this page for 2 hours.
- All audit results stay in the Alarms and Events history for up to 7 days.
- Automatic audits run at configured times to verify the accuracy of each data base instance.

- A manual audit allows specification of audit between SDS master database instance and any other database instance, based on some data range (i.e. audit IMSI range) or subscriber name.

The data base instances that are verified are

- Primary site standby database instance
- Primary site Query Server database instance
- Disaster Recovery site – active, standby and Query Server database instances
- Each DP site – all database instances

Audit elements

The **SDS Maintenance Audit** page consists of two tabs: Status and Request. Each tab contains their own associated elements described in [Table 30: Audit Status Elements](#) and [Table 31: Audit Request Elements](#).

Table 30: Audit Status Elements

Element	Description
Hostname	Name of the server the audit runs on
Type	Type of audit; either manual or automatic.
Table(s)	Type of data table audited; either All, IMSI, MSISDN, NAI User, Wildcard NAI User
Audit State	State the audit is in at the time of the last Update Time. If auto refresh is enabled for this page the this field will be updated. Possible values are: <ul style="list-style-type: none"> • Success - audit has completed • Fail - audit did not complete successfully • Running - audit in progress • Preempted - audit was preempted • Paused - audit is paused
Records Audited	Total number of records that were audited
Blocks Corrected	Number of database blocks that contained discrepancies
Request Time	Date and time the audit was requested
Start Time	Date and time the audit started
Update Time	Date and time the audit status was last updated.
Start	Start of the range for the database audit, if specified
End	End of the range for the database audit, if specified
User Comment	Optional text used to provide information about the audit. For example, an explanation of the purpose or the audit owner's name. This field is optional.

Table 31: Audit Request Elements

Element	Description	Data Input Notes
Data	Type of data to include in audit	Format: Selection buttons Range: MSISDN, IMSI, NAI User, Wildcard NAI User Default: MSISDN
Start Address	Starting address of data to be included in this audit (applies to MSISDN and IMSI audit requests only)	Format: Digits only Range: 8 - 15 digits for MSISDN Range: 10 - 15 for IMSI
End Address	Ending address of data to be included in this audit (applies to MSISDN and IMSI audit requests only)	Format: Digits only Range: 8 - 15 digits for MSISDN Range: 10 - 15 for IMSI Default: blank
Comment	Optional text used to provide information about the audit. For example, an explanation of the purpose or the audit owner's name. This field is optional.	Format: Alphanumeric Range: up to 35 characters Default: blank

Viewing the status of an audit

The **SDS -> Maintenance -> Audit** page allows you to view all pending, completed, and failed database audits of data performed throughout the system.

1. Select **SDS -> Maintenance -> Audit**.
The **SDS Maintenance Audit** page appears.
2. Select the **Status** tab.

The **SDS -> Maintenance -> Audit** page appears. All audits are displayed in tabular form. The display fields are described in [Table 32: Audit filtering categories](#).

3. Select the category by which to perform the filtering.

Table 32: Audit filtering categories

Category	Description
None	No filtering (default)
Hostname	The host where the audit runs
Type	The type of audit (Manual or Automatic)
Table(s)	Table audited (All, IMSI, MSISDN, NAI User, Wildcard NAI User)

Category	Description
Audit State	Current state of the audit (Success, Fail, Running, Scheduled, Preempted or Paused)
Records Audited	Total number of records audited
Blocks Corrected	Number of Database blocks that had records with discrepancies
Request Time	Time audit was requested
Start Time	Time audit started
Update Time	Time audit status updated
Start	Start range of data audited
End	End range of data audited
User Comment	User's comment entered in request

- Choose the filtering operator.

Table 33: Audit filtering operators

Operator	Description
=	Is equal to
!=	Is not equal to
>	Is greater than
>=	Is equal to or greater than
<	Is less than
<=	Is equal to or less than
Like	Is Like (wildcard is * character)
Is Null	has no entry (is zero)

- Enter the target character string to filter on in the text box.
- Use Auto Refresh to select the time interval for the status to be refreshed.

Table 34: Audit display refresh time

Time	Description
15	15 seconds
30	30 seconds
Off	Off (default)

- Click **Go** to show results.

Requesting an audit

You can use this task to request a site-wide database audit of a specified subset of MSISDN, IMSI, NAI User or Wildcard NAI User data. The request is sent to all nodes and the results are merged back up to SDS. Since each node is responsible for managing its own resources, some nodes may decide to delay or cancel the requested audit in order to maintain sufficient resources to process signaling traffic.

1. Select **SDS -> Maintenance -> Audit**.
The **SDS Maintenance Audit** page appears.
2. Select the **Request** tab.
3. Select the type of data you want included in the audit from the **Data** pulldown list.
If you select **NAI User** or **Wildcard NAI User**, go to Step 5.
4. If you selected either **MSISDN** or **IMSI** as the **Data** type, enter data in the following fields:
 - **Start Address** field: Starting address of data to be included in this audit. This must be between 8 and 15 digits for MSISDN or 10-15 for IMSI.
 - **End Address** field: Ending address of data to be included in this audit. This is an optional field that, if used, must be between 8 and 15 digits for MSISDN or 10-15 for IMSI.
5. Enter any text about the audit you want to include in the **Comment** field, if needed.
6. Click **Request**.

The database audit request is made. The status of the request can be viewed on the **SDS -> Maintenance -> Audit** page.

Remote Audit

The **SDS Maintenance Remote Audit** menu option allows you to access an on-demand ability to initiate an audit of the remote HLR Router provisioning database and flag any differences found between the SDS and the HLR Router databases. This provisioning database audit includes MSISDNs and, IMSIs and their associated Network Entity address values, which are extracted from the Destination Map table.

When you submit an audit request on the SDS GUI maintenance page, a PDBI client called *pdbaudit* connects to the local PDBA and to the remote PDBA running on the HLR Router system. It sends request commands to both PDBAs, compares the response data, and reports any discrepancies between the two databases. Then you can check the status and review the results of the audit on the SDS GUI status page.

SDS supports manual audit runs between the SDS master data base instance and the HLR Router data base instance. Configurable automated audit runs are those runs that run at configured times to verify the accuracy of SDS master and HLR Router data base instances. A manual audit allows specification of audit between SDS master and HLR Router data base instances, based on some data range (for example, audit IMSI range) or single MSISDN or IMSI value.

SDS supports an on-demand ability to initiate an audit of the remote HLR Router provisioning database and flag any differences found between the SDS and the HLR Router databases. HLR Router provisioning data to be audited can be specified in one of two ways - by a single range of numbers, or by an input file containing multiple ranges of numbers. Using an input file allows an operator to

specify multiple IMSI and MSISDN ranges at one time versus scheduling multiple remote HLR Router audits on a single range.

Use the following tabs to view the status of the database remote audits and to request a site-wide database audit of a specified subset of provisioning data:

- The **Remote Audit Status** tab allows you to view all pending, completed, and failed database remote audits of data performed throughout the system.
- The **Remote Audit Request** tab allows you to request a remote audit between SDS and HLR Router data using a subset of MSISDN or IMSI values.

Since each node is responsible for managing its own resources, some nodes may decide to delay or cancel the requested audit in order to maintain sufficient resources to process signaling traffic.

Remote Audit elements

The **SDS Maintenance Remote Audit** page consists of two tabs: Status and Request. Each tab contains their own associated elements described in [Table 35: Remote Audit Request Elements](#) and [Table 36: Remote Audit Status Elements](#).

Table 35: Remote Audit Request Elements

Element	Description
Data Type	Type of audit; MSISDN or IMSI.
Audit State	Audit type; Range or File.
Start of Range	Starting address of data to be included in this audit request.
End of Range	Ending address of data to be included in this audit request.
Input File	File that contains ranges of values to be included in this audit.
Comment	Optional text used to provide information about the audit. For example, an explanation of the purpose or the audit owner's name. This field is optional.

Table 36: Remote Audit Status Elements

Element	Description	Description
Action	Available actions.	Format: Selectable word
Type	Type of data being audited.	Format: MSISDN or IMSI
Range/File	Range of data being audited or file name that contains ranges of data being audited.	Format: Digits only Range: 8 - 15 digits for MSISDN Range: 10 - 15 for IMSI

Element	Description	Description
Remote IP	IP address for Remote HLR Router system used for auditing.	Format: Digits only Range: 8 - 15 digits for MSISDN Range: 10 - 15 for IMSI
Remote Port	Port for Remote HLR Router system used for auditing.	Format: Digits only
Start Time/Completion Time	Date and time audit started and completed.	Format: Time notation
State	Current state of the Remote audit.	Format: Alpha <ul style="list-style-type: none"> • Submitted • Queued • In Progress • Aborting • Aborted • Failed • Completed
Audited	Total number of records audited.	Format: Digits
Same	Number of matched records on both SDS and the Remote HLR Router system.	Format: Digits
Diff	Number of mismatched records between SDS and Remote HLR Router system.	Format: Digits
Missing	Number of SDS records that are missing on the Remote HLR Router system.	Format: Digits
Extra	Number of HLR Router records that are missing on the local SDS system.	Format: Digits
Unknown	Number of records in SDS and/or HLR Router on which a retrieve data command timed out.	Format: Digits
Errors	Number of errors that occurred during the audit. See trace log for more information.	Format: Digits
Report	Name of generated remote audit report	Format: Alphanumeric

Viewing the status of a remote audit

The SDS -> Maintenance -> Remote Audit page allows you to view all pending, completed, and failed remote database audits of data performed throughout the system.

1. Select **SDS -> Maintenance -> Remote Audit**.
The **SDS Maintenance Remote Audit** page appears.
2. Select the **Status** tab.
The **SDS -> Maintenance -> Remote Audit** page appears. All audits are displayed in tabular form. The display fields are described in [Remote Audit elements](#).
3. Select the category by which to perform the filtering.
4. Choose the filtering operator.

Table 37: Audit filtering operators

Operator	Description
=	Is equal to
!=	Is not equal to
>	Is greater than
>=	Is equal to or greater than
<	Is less than
<=	Is equal to or less than
Like	Is Like (wildcard is * character)
Is Null	Has no entry (is zero)

5. Enter the target character string to filter on in the text box.
6. Use Auto Refresh to select the time interval for the status to be refreshed.

Table 38: Audit display refresh time

Time	Description
15	15 seconds
30	30 seconds
Off	Off (default)

7. Click **Go** to show results.

Requesting a remote audit

You can use this task to request a site-wide remote database audit of a specified subset of MSISDN, IMSI, NAI User or Wildcard NAI User data. The request is sent to all nodes and the results are merged

back up to SDS. Because each node is responsible for managing its own resources, some nodes might decide to delay or cancel the requested audit in order to maintain sufficient resources to process signaling traffic.

Note: A valid input file name can be up to 80 characters in length.

1. Select **SDS -> Maintenance -> Remote Audit**.
The **SDS Maintenance Remote Audit** page appears.
2. Select the **Request** tab.
3. Select the type of data you want included in the audit from the **Data Type** pulldown list.
If you select **NAI User** or **Wildcard NAI User**, go to Step 5.
4. Select a range for **Audit By**, enter data in the following fields:
 - **Start of Range** field: Starting address of data to be included in this audit. This must be between 8 and 15 digits for MSISDN or 10-15 for IMSI.
 - **End of Range** field: Ending address of data to be included in this audit. This is an optional field that, if used, must be between 8 and 15 digits for MSISDN or 10-15 for IMSI.
5. Provide the file name that contains ranges of values to be included in this audit.
6. Enter any text about the audit you want to include in the **Comment** field, if needed.
7. Click **Request**.

The database audit request is made. The status of the request can be viewed on the **SDS -> Maintenance -> Remote Audit** page.

Query

The **SDS Maintenance Query** page allows you to query database information for a single provisioning database entry, or for a range of the same type of provisioning database entries, on an available server. Any server that hosts a copy of the provisioning database can be used. Query options include MSISDN, IMSI, Destination, NAI Host, NAI User, Wildcard NAI User, Counts, Counts by Destination, and DB Level.

Querying a server for provisioning data allows you to see if data is being replicated correctly to each server, and allows you to see if adjustments to data management or to the subscriber database need to be made.

Query elements

The **SDS Maintenance Query** page consists of query entry dialogue boxes and results display. Not all elements of the entry dialogue boxes or query results may be used once the "Data" type is selected. All elements available through Query entry dialogue boxes are presented in [Table 39: Query Entry Elements](#). All elements available through Query results display, in alphabetical order, are presented in [Table 40: Query Results Elements](#).

Table 39: Query Entry Elements

Element	Description	Data Input Notes
Data	Type of data to include in audit	Format: Drop down list Range: MSISDN, IMSI, NAI User, Wildcard NAI User, NAI Host, Destination, Counts, Counts by Destination, DB Level Default: MSISDN
Start Address	Starting address of data to be included in this audit (applies to MSISDN and IMSI audit requests only)	Format: Digits only Range: 8 - 15 digits for MSISDN and 10 - 15 for IMSI
End Address	Ending address of data to be included in this audit (applies to MSISDN and IMSI audit requests only)	Format: Digits only Range: 8 - 15 digits for MSISDN and 10 - 15 for IMSI Default: blank
NAI Host	NAI Host to query applies to NAI users only	NAI Host defaults to the first one configured in the table.
Server	Server on which to run the query	Format: Alphanumeric Range: up to 35 characters Default: local server

Table 40: Query Results Elements

Result Element	Description	Data Value Selected
AAA	AAA Destination record (with type= aaa) or blank for none	MSISDN, IMSI, NAI User, Wildcard NAI User
Destination(s)	Unique text used to identify a Destination	Counts, Counts by Destination
FQDN	A 1-255 character string for the Diameter FQDN for the Destination. The value can be null	Destination
Host	NAI Host	NAI User, Wildcard NAI User, NAI Host
IMSI	A unique string of 10-15 decimal digits identifying the IMSI	IMSI, Counts, Counts by Destination

Result Element	Description	Data Value Selected
IMSHSS	IMS HSS Destination record (with type= imsHss) or blank for none	MSISDN, IMSI, NAI User, Wildcard NAI User
LTEHSS	LTE HSS Destination record (with type= lteHss) or blank for none	MSISDN, IMSI, NAI User, Wildcard NAI User
MSISDN	A unique string of 8-15 decimal digits identifying the MSISDN	MSISDN, Counts, Counts by Destination
NAI Hosts	Number of NAI hosts	Counts
NAI User	A string of 1-64 characters for the NAI User Name	NAI User, Counts, Counts by Destination
Name	A unique string of 1-32 characters to identify the Destination	Destination
OCS	OCS Destination record (with type= ocs) or blank for none	MSISDN, IMSI, NAI User, Wildcard NAI User
OfCS	OFCS Destination record (with type= ofcs) or blank for none	MSISDN, IMSI, NAI User, Wildcard NAI User
PCRF	PCRF Destination record (with type= pcrf) or blank for none	MSISDN, IMSI, NAI User, Wildcard NAI User
Realm	A 1-255 character string for the Diameter Realm for the Destination. The value can be null	Destination
Type	Destination type	Destination
USERDEF1	UserDef1 Destination record (with type= userDef1) or blank for none	MSISDN, IMSI, NAI User, Wildcard NAI User
USERDEF2	UserDef2 Destination record (with type= userDef2) or blank for none	MSISDN, IMSI, NAI User, Wildcard NAI User
Wildcard NAI User	A string of 1-64 characters for the wild carded NAI User Name.	Wildcard NAI User, Counts, Counts by Destination
DB Level	Numeric value of Database level	DB Level

Running a query (MSISDN or IMSI)

You can use this task to query a single MSISDN (or range of MSISDNs) or a single IMSI (or range of IMSIs) on any server within the system.

1. Select **SDS** ► **Maintenance** ► **Query**.

The **SDS Maintenance Query** page appears.

2. Select **MSISDN** or **IMSI** from the **Data** pulldown list.
3. Enter the starting address of data to be included in this audit in the **Start Address** field.
4. Enter the ending address of data to be included in this audit in the **End Address** field.
5. Select the server you want to run the query on in the **Server** pulldown list.
6. Click **Query**.

The query is run and any relevant data is displayed on the page. See [Table 40: Query Results Elements](#).

Running a query (NAI User)

You can use this task to query all of the NAI Users on any host and server within the server within the system.

1. Select **SDS ► Maintenance ► Query**.
The **SDS Maintenance Query** page appears.
2. Select **NAI User** from the **Data** pulldown list.
3. Select the NAI Host to be included in this audit in the **NAI Host** field.
4. Select the server you want to run the query on in the **Server** pulldown list.
5. Click **Query**.

The query is run and any relevant data is displayed on the page. See [Table 40: Query Results Elements](#).

Running a query (Wildcard NAI User, NAI Host, Destination, Counts, Counts by Destination, or DB Level)

You can use this task to query all of the following:

- Wildcard NAI User
- NAI Host
- Destination Counts
- Counts by Destination Users on any server within the system

1. Select **SDS ► Maintenance ► Query**.
The **SDS Maintenance Query** page appears.
2. Select one of the following from the **Data** pulldown list:
 - **Wildcard NAI User**
 - **NAI Host**
 - **Destination**
 - **Counts**
 - **Counts by Destination**
 - **DB Level**
3. Select the server you want to run the query on in the **Server** pulldown list.
4. Click **Query**.

The query is run and any relevant data is displayed on the page. See [Table 40: Query Results Elements](#).

NPA Splits maintenance

Use this selection when you want to manage an NPA split in advance of a Permissive Dialing Period.

NPA Split refers to the telephone-numbering scheme that subdivides an old area code (old NPA) by the creation of a new area code (new NPA). This is necessary when the number of telephones in an old area code (old NPA) grows to an excessive number. As new area codes are defined (new NPA), some existing exchanges (NXX) may be assigned to the new area code (new NPA) from the old area code (old NPA).

The split is in the Pending state until it becomes Active on the Start date of the PDP. While in the Active state, Dialed Numbers (DN) in the split's NXX can use either the old NPA or the new NPA. After the split becomes complete on the End date of the PDP, only the new NPA can be used in a DN.

To manage NPA splits through the GUI, you must have group permission access to **NPA Splits** and **NPA Split Maintenance**.

NPA Splits elements

Use the **SDS Maintenance NPA Splits** page to manage NPA splits. This table describes fields on this page.

Table 41: NPA Splits Maintenance Elements

Element	Description	Data Input Notes
Old NPA	The Numbering Plan Area that the DNs will be split from. (Retrieve splits in which this NPA was the old NPA)	Format: Integer Range: 200 - 999, 3-digit number Default: blank
New NPA	The Numbering Plan Area that the DNs will be split to. (Retrieve splits in which this NPA was the new NPA)	Format: Integer Range: 200 - 999, 3-digit number Default: blank
NXX	The exchange code value for this split. (Retrieve splits in which this NXX was the NXX.) On the Modify and Delete tabs, an All selection box is also available. If this box is checked (the default) when the Modify or Delete button is clicked, all NXXs are modified or deleted.	Format: Integer Range: 000 - 999, 3-digit number Default: blank

Element	Description	Data Input Notes
PDP Start	<p>The start of the Permissive Dialing Period for this split. Grayed if NPA split is active.</p> <ul style="list-style-type: none"> This date cannot be in the past, and must be before the PDP End date. Activation occurs within the first 15 minutes of the PDP Start date. If today's date is entered, activation occurs within 15 minutes of the Create or Modify button being clicked. This field only appears on the Create and Modify tabs. 	<p>Format: Pulldown menus Range: Valid date Default: Tomorrow's date</p>
PDP End	<p>The end of the Permissive Dialing Period for this split.</p> <ul style="list-style-type: none"> This date cannot be in the past, and must be after the PDP Start date. Termination occurs within the first 15 minutes of the PDP End date. The date cannot be changed once the NPA split is complete. This field only appears on the Create and Modify tabs. 	<p>Format: Pulldown menus Range: Valid date Default: Tomorrow's date + 90 days</p>

Viewing NPA Splits

Use this task to display active or non-active NPA Split information.

From the View Tab, all NPA Split information can be displayed. Each field can be used as a filter option when viewing NPA splits.

If you click **View** while all three fields are empty, the GUI displays all NPA splits found in the PDB database. If the **Save Results** checkbox is check marked, the results are also saved to a CSV file named `NpaSplitReport.guiadmin.<timestamp>.csv`. This file can then be viewed and downloaded in the SDS file management area (**Status & Manage > Files**).

1. Select **SDS > Maintenance > NPA Splits**.
The **SDS Maintenance NPA Splits** page appears, with the **View** tab displayed.
2. Add search criteria to the fields in the **Value** column, as desired.

3. To save results of NPA split information to a file for further viewing and/or processing, click to check mark **Save Results**.
4. Click **View**.

The NPA splits in the PDB database that match the criteria entered are shown on the bottom of the page. For information about how to filter this information, see [NPA Splits elements](#).

If **Save Results** was checked, the CSV file is generated.

Creating an NPA Split

From within the Create Tab, you can create NPA Splits.

Use this procedure to create an NPA split and define its characteristics, including the old NPA code, the new NPA code, the central office exchange (NXX) code(s) to be transferred to the new NPA, and the beginning and ending dates of the Permissive Dialing Period (PDP).

1. Select **SDS ► Maintenance ► NPA Splits**
The **SDS Maintenance NPA Splits** page appears.
2. Click the **Create** tab.
The NPA Splits **Create** table appears.
3. Enter data to provision an NPA split. Values must be entered for **Old NPA**, **New NPA**, and **NXX**. If dates are entered in the **PDP Start** and/or **PDP End** dates, these dates must be greater than today's date.
For more information about these fields, see [NPA Splits elements](#).
4. Click **Create**.

The NPA Split record is provisioned. Its state is initialized to Pending.

Modifying an NPA Split

Use this procedure to modify the start and/or end the Permissive Dialing Period (PDP) dates of one or more existing NPA splits.

1. Select **SDS ► Maintenance ► NPA Splits**.
The **SDS Maintenance NPA Splits** page appears.
2. Click the **Modify** tab.
The **NPA Splits Modify** tab appears.
3. Enter the **Old NPA**, **New NPA**, and **NXX** fields to select the NPA to modify. To modify all **NXX**, leave the **All** selection box check marked.
4. Enter the **PDP Start** and/or **PDP End** dates, as needed.
Both the **PDP Start** and **PDP End** dates can be modified for pending splits. Only the **PDP End** date can be modified for active splits. Neither can be modified for completed splits. The **PDP End** date must be greater than today's date.
For more information about these fields, see [NPA Splits elements](#).
5. Click **Modify**.

The NPA splits are updated.

Deleting an NPA Split

Use this procedure to delete NPA Splits whose Permissive Dialing Period is pending or has expired.

1. Select **SDS ► Maintenance ► NPA Splits**.
The **SDS Maintenance NPA Splits** page appears.
2. Select the **Delete** tab.
The **NPA Splits Delete** tab appears.
3. Enter values into the fields to select the NPA splits you want to delete. To delete all **NXX**, leave the **All** selection box check marked.
4. Click **Delete**.
A confirmation pop up window appears, asking if you are sure you want to delete this NPA split.
5. Click **OK** to continue with the deletion.

The selected NP splits are deleted, and a Delete successful message is displayed.

Glossary

A

AAA Authentication, Authorization, and Accounting

C

CID Connection ID

D

DP SOAM Data Processor System Operations, Administration, and Maintenance

DSR Diameter Signaling Router
A set of co-located Message Processors which share common Diameter routing tables and are supported by a pair of OAM servers. A DSR Network Element may consist of one or more Diameter nodes.

F

FABR Full Address Based Resolution
Provides an enhanced DSR routing capability to enable network operators to resolve the designated Diameter server addresses based on individual user identity addresses in the incoming Diameter request messages.

FQDN Fully qualified domain name
The complete domain name for a specific computer on the Internet (for example, www.tekelec.com).

G

GUI Graphical User Interface

G

The term given to that set of items and facilities which provide the user with a graphic means for manipulating screen data rather than being limited to character based commands.

H

HSS

Home Subscriber Server

A central database for subscriber information.

I

IMS

IP Multimedia Subsystem

These are central integration platforms for controlling mobile communications services, customer management and accounting for mobile communications services based on IP. The IMS concept is supported by 3GPP and the UMTS Forum and is designed to provide a wide range of application scenarios for individual and group communication.

IMSI

International Mobile Subscriber Identity

IP

Internet Protocol

IP specifies the format of packets, also called datagrams, and the addressing scheme. The network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer.

L

L

LTE	<p>Long Term Evolution</p> <p>The next-generation network beyond 3G. In addition to enabling fixed to mobile migrations of Internet applications such as Voice over IP (VoIP), video streaming, music downloading, mobile TV, and many others, LTE networks will also provide the capacity to support an explosion in demand for connectivity from a new generation of consumer devices tailored to those new mobile applications.</p>
-----	--

M

MSISDN	<p>Mobile Station International Subscriber Directory Number</p> <p>The MSISDN is the network specific subscriber number of a mobile communications subscriber. This is normally the phone number that is used to reach the subscriber.</p>
--------	--

N

NAI	<p>Network Access Identifier</p> <p>The user identity submitted by the client during network authentication.</p>
NPA	<p>Number Plan Area</p> <p>The North American "Area Codes." (3 digits: 2- to-9, 0-or 1, 0-to-9. Middle digit to expand soon).</p>

NXX	Central Office Exchange Code
-----	------------------------------

O

OAM	<p>Operations, Administration, and Maintenance</p> <p>The application that operates the Maintenance and Administration</p>
-----	--

O

Subsystem which controls the operation of many Tekelec products.

OCS

Online Charging Server

P

PCRF

Policy and Charging Rules Function
The ability to dynamically control access, services, network capacity, and charges in a network.

PDP

Permissive Dialing Period

S

SDS

Subscriber Database Server

Subscriber Database Server (SDS) provides the central provisioning of the Full-Address Based Resolution (FABR) data. The SDS, which is deployed geo-redundantly at a Primary and Disaster recovery site, connects with the Query Server and the Data Processor System Operations, Administration, and Maintenance (DP SOAM) servers at each Diameter Signaling Router (DSR) site or a standalone DP site to replicate and recover provisioned data to the associated components.

SOAM

System Operations,
Administration, and Maintenance

SOAP

Simple Object Access Protocol

X

XML

eXtensible Markup Language

A version of the Standard Generalized Markup Language (SGML) that allows Web developers

X

to create customized tags for additional functionality.