Oracle® Communications
Network Charging and Control
Social Networking Service Template User's and
Technical Guide
Release 5.0.1

June 2013
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Contents

About This Document ............................................................................................................. vii
Document Conventions ......................................................................................................... viii

Chapter 1

System Overview ..................................................................................................................... 1
  Overview ............................................................................................................................. 1
  What is SNST? ..................................................................................................................... 1
  SNST Social Business Intelligence ...................................................................................... 2
  Social Networking Sites and SNST ..................................................................................... 6
  Alarms, Statistics, Reports and EDRs .................................................................................... 7

Chapter 2

Social Networking Service Template ....................................................................................... 11
  Overview ............................................................................................................................. 11
  Social Networking Service Template Description ............................................................. 11
  SNST Self Care and IVR ..................................................................................................... 15
  SOAP Interface ................................................................................................................ 15
  SMS .................................................................................................................................. 15
  Number Normalization ...................................................................................................... 16

Chapter 3

SNST Subscribers .................................................................................................................... 19
  Overview ............................................................................................................................. 19
  SNST Subscribers ................................................................................................................ 19
  SNST Keywords ................................................................................................................ 21
  SNST Service Registration ................................................................................................. 23
  Phone Friend Lists ............................................................................................................ 28
  Phone Friend Links .......................................................................................................... 28
  Query Phone Friends ........................................................................................................ 34
  Number Change ............................................................................................................... 37
  Porting In and Out .......................................................................................................... 37
  Notification SMS .............................................................................................................. 38

Chapter 4

Phone Friend Link Benefits .................................................................................................. 41
  Overview ............................................................................................................................. 41
  Voice Services ................................................................................................................... 41
  SMS ................................................................................................................................. 42

Chapter 5

SNST Service Bundles .......................................................................................................... 45
  Overview ............................................................................................................................. 45
  Service Bundles ............................................................................................................... 45
User Profiles ......................................................................................................................87

Chapter 12

Social Networking Service Template UI ......................................................... 89
  Overview ........................................................................................................................ 89
  Edit Subscriber Screen for SNST Subscribers .............................................................. 89
  SNST Product Type Configuration ......................................................................... 92

Chapter 13

SNST Business Intelligence .................................................................................. 99
  Overview ....................................................................................................................... 99
  About SNST Business Intelligence ........................................................................... 99

Chapter 14

Social Networking Service Template Configuration ................................. 101
  Overview ....................................................................................................................... 101
  SNST Generic Concepts ............................................................................................ 101
  SNST Product Type Profile Data .............................................................................. 103
  SNST Global Configuration ...................................................................................... 106
  SNST Reports ............................................................................................................. 108
  SNST Control Plans .................................................................................................. 108
  Detailed Control Plan Logic ..................................................................................... 114
  SNST_SMS_Keyword Control Plan ..................................................................... 116
  Registration Sub Control Plan ............................................................................... 118

Chapter 15

SNST Performance Tuning ............................................................................... 121
  Overview ....................................................................................................................... 121
  Performance Tuning Configuration Overview ....................................................... 121
  DAP Configuration for Load Balancing .................................................................. 121
  PI Configuration for Load Balancing ...................................................................... 122
  Apache and Mod Proxy Balancer Configuration .................................................. 124

NCC Glossary of Terms .................................................................................... 127

Index ......................................................................................................................... 137
About This Document

Scope
The scope of this document includes all functionality a user must know in order to effectively operate the Oracle Communications Network Charging and Control Social Networking Service Template.

Audience
This guide is written primarily for:
- administrators
- operators, and
- Customer Service Representatives.
However, the overview sections of the document are useful to anyone requiring an introduction.

Prerequisites
Although it is not a prerequisite to using this guide, familiarity with the target platform would be an advantage.

This manual describes system tasks that should only be carried out by suitably trained operators.
Document Conventions

Typographical Conventions

The following terms and typographical conventions are used in the Oracle Communications Network Charging and Control (NCC) documentation.

<table>
<thead>
<tr>
<th>Formatting convention</th>
<th>Type of information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Special Bold</strong></td>
<td>Items you must select, such as names of tabs. Names of database tables and fields.</td>
</tr>
<tr>
<td><strong>Italics</strong></td>
<td>Name of a document, chapter, topic or other publication. Emphasis within text.</td>
</tr>
<tr>
<td><strong>Button</strong></td>
<td>The name of a button to click or a key to press. Example: To close the window, either click <strong>Close</strong>, or press <strong>Esc</strong>.</td>
</tr>
<tr>
<td><strong>Key+Key</strong></td>
<td>Key combinations for which the user must press and hold down one key and then press another. Example: <strong>Ctrl+P</strong>, or <strong>Alt+F4</strong>.</td>
</tr>
<tr>
<td><strong>Monospace</strong></td>
<td>Examples of code or standard output.</td>
</tr>
<tr>
<td><strong>Monospace Bold</strong></td>
<td>Text that you must enter.</td>
</tr>
<tr>
<td><strong>variable</strong></td>
<td>Used to indicate variables or text that should be replaced.</td>
</tr>
<tr>
<td><strong>menu option &gt; menu option</strong></td>
<td>Used to indicate the cascading menu option to be selected, or the location path of a file. Example: <strong>Operator Functions &gt; Report Functions</strong> Example: <strong>/IN/html/SMS/Helptext/</strong></td>
</tr>
<tr>
<td><strong>hypertext link</strong></td>
<td>Used to indicate a hypertext link on an HTML page.</td>
</tr>
</tbody>
</table>

Specialized terms and acronyms are defined in the Glossary at the end of this guide.
Overview

Introduction

This chapter describes Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) and the concepts it uses. It also describes the standard NCC monitoring tools.

In this chapter

This chapter contains the following topics.

What is SNST? 1
SNST Social Business Intelligence 2
Social Networking Sites and SNST 6
Alarms, Statistics, Reports and EDRs 7

What is SNST?

About SNST

The Social Networking Service Template (SNST) helps an operator to reduce subscriber churn by providing subscriber benefits such as preferential tariffs or discounts when they call each other after establishing relationships.

The SNST enables subscribers to establish relationships by first registering for the SNST service and then inviting other subscribers to become ‘friends’. Once a friend link has been established, whenever a subscriber calls a friend they will receive the applicable SNST discount.

Friends can be on-net (within the same operator) or off-net (in another operator). On-net subscribers can be in a registered, unregistered or deactivated state.

When a friend link has been established:

- With a registered subscriber, both parties can benefit from the SNST discount, and the friend does not need to create a link to the other subscriber.
- With an unregistered or blocked subscriber, only the originating subscriber benefits from the SNST discount, and the friend must become registered to also benefit.

SNST relationship management is mainly performed through SMS interactions that trigger control plans, and through a web portal that talks to the NCC platform using XML or SOAP interactions. Subscribers can use this mechanism to register for the service, and then add or remove friends.
Integration with IT eco-system

Here is an example of how the SNST can be integrated with social networking domains.

SNST Social Business Intelligence

Introduction

There are four types of atoms recognized in social networking relationships:

- Influential atom
- Pressured atom
- High risk atom
- Target atom

Influential atom

An influential atom has:

- Strong links to many friends
- A central position in a social network
- High number of received friend requests in subscriber friend profile
Influential atom relationships
Here is an example social relationship, highlighting the influential atom.

Importance of influential atoms to carriers
Influential atoms are important to carriers because they:
- Impose their influence on others.
- Recommend / condemn products or services.
- Pass viral communication to friends.

Downstream impact
The downstream impact of the influential atom within their social graph is:
- Retain Influential Atoms -> Retain their on-net friends
- By being an on-net advocator
- Retain Influential Atoms -> Acquire their off-net friends
- Using their influence & by being an on-net advocator

Rewards
See *Influential Atom Rewards* (on page 53) for details of providing a rewards retention scheme.

Pressured atom
A pressured atom has:
- Many links to off-net subscribers
- High number of off-net friends
Pressured atom relationships
Here is an example social relationship, highlighting the pressured atom.

Importance of pressured atoms to carriers
Pressured atoms are important to carriers because:

- They have many interactions with friends on a rival network resulting in higher propensity to churn.
- Calls to off-net are more expensive; so the friends of pressured atoms would benefit if the pressured atom switched network, resulting in pressure to churn.

Downstream impact
The downstream impact of the pressured atom within their social graph is:

- More probable to join friends on a rival network
- Offer rewards to acquire their off-net friends

Rewards
See Pressured Atom Rewards (on page 54) for details of providing a rewards retention scheme.

High risk atom
A high risk atom is a friend of a recent port-out atom.
High risk atom relationships
Here is an example social relationship, highlighting the high risk atoms.

[Diagram of social relationships with nodes labeled David, Laura, George, Charlie, Colin, Maliess, Off-net A, Off-net B, Off-net C, and Ben]

Importance of high risk atoms to carriers
High risk atoms are important to carriers because:

- They have high value atomic relationships with churned friend
- They are socially influenced by churned friend
- Of the viral churn effect – friends may also churn

Downstream impact
The downstream impact of the high risk atom within their social graph is:

- Higher propensity for all friends of churned subscriber to join friend on a rival network.
- If high risk atoms can be highlighted, the operator has a chance to break viral churn effect.

Rewards
See High Risk Atom Rewards (on page 55) for details of providing a rewards retention scheme.

Target atom
A target atom:

- Is an Off-Net subscriber
- Has a high number of on-net friends
Target atom relationships
Here is an example social relationship, highlighting the target atom.

Importance of target atoms to carriers
Target atoms are important to carriers because they:

- Have a higher propensity to switch networks
- They join their on-net friends.

Downstream impact
The downstream impact of the target atom within their social graph is:

- Use on-net atoms influence to try to persuade target atom to switch networks
- Increase ARPU

Social Networking Sites and SNST

Social networking site integration
You can integrate the SNST with social networking web sites such as Facebook, hi5, myspace, and so on. You should use the interface on the NCC platform to integrate with the social networking web site and send requests through XML/SOAP operations.

You will need to provide the following additional development and services to enable subscribers to use the SNST from their favorite social networking web site:

- Develop an application that can be downloaded from a widget gallery.
- Provide a gateway from the widget or application service provider to the NCC platform.

For more information on XML/SOAP operations, see Web Portal (on page 61).
Example social network event flow

This example process describes the flow of events that occur when a social network site user queries the SNST. Each social networking site is different, and therefore some of the features described below should be adapted for each social networking site.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A user who has the application installed in a social networking web site, logs in to the social networking site and opens the application.</td>
</tr>
<tr>
<td>2</td>
<td>The application service provider performs mobile verification of the MSISDN associated with the social networking ID by sending a password to the handset. The user must enter the password into the screens of the widget. On successful mobile verification the application service provider can trigger commands on behalf of the user.</td>
</tr>
<tr>
<td>3</td>
<td>The application requests SNST status and balance information from the gateway servers of the application service provider. The gateway servers use XML/SOAP to query the SNST status and Balance status of the user.</td>
</tr>
<tr>
<td>4</td>
<td>The application correlates the retrieved data with the social networking site profile of the user. For example, it correlates SNST friends with the friends on the social networking site that also have the application installed.</td>
</tr>
<tr>
<td>5</td>
<td>The user can create SNST Friend Links to friends on the social networking site by selecting the friend and clicking a button in the application.</td>
</tr>
<tr>
<td>6</td>
<td>The application will issue a Friend Link request to the gateway servers, which in turn use the SOAP operation command to issue the Friend Link request to the SNST platform.</td>
</tr>
<tr>
<td>7</td>
<td>The result of the Friend Link request is passed back to the application via the gateway servers</td>
</tr>
</tbody>
</table>

Alarms, Statistics, Reports and EDRs

Introduction

SNST uses the centralized management services of SMS to assist the administration of the services.

Alarms

The SNST uses the SMS integrated alarms collection, viewing and forwarding system. The alarms generated by all components of the SNST are consolidated on the SMS and stored in a centralized alarm database.

The operator can:

- View the alarms through the alarm viewer.
- Forward all alarms to an integrated external fault management system using SNMP v1 or v3. Alarms can be automatically deleted from the SMF alarm database after a configurable period.

For more information about the alarms subsystem, see *SMS Technical Guide*.

Statistics

SNST statistics are collected at both the system and application levels. The statistics provide information on the performance and load of the platform. All measurements are consolidated on the SMS and stored in a centralized statistics database.
You can view the statistics through the **Statistics Viewer**. For more information on statistics and the **Statistic Viewer**, see *SMS User's Guide*.

**Ccs_Service statistics**

This table describes the statistics produced by CCS activity.

**Note:** These statistics are reported as Ccs_Service statistics.

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS_PD_FAIL</td>
<td>Number of failed DAP requests.</td>
</tr>
<tr>
<td>CCS_PD_SUCS</td>
<td>Number of successful DAP requests.</td>
</tr>
<tr>
<td>NUM_BE_FAIL</td>
<td>Number of calls rejected due to VWS failure.</td>
</tr>
<tr>
<td>NUM_BUSY</td>
<td>Number of calls terminated to busy number.</td>
</tr>
<tr>
<td>NUM_IDP</td>
<td>Number of InitialDP triggering CCS service.</td>
</tr>
<tr>
<td>NUM_NO_ANSWER</td>
<td>Number of calls terminated but not answered.</td>
</tr>
<tr>
<td>NUM_NSF</td>
<td>Number of calls rejected for insufficient funds.</td>
</tr>
<tr>
<td>NUM_RSF</td>
<td>Number of calls causing route selection failure.</td>
</tr>
<tr>
<td>NUM_TERM</td>
<td>Number of calls terminated successfully.</td>
</tr>
</tbody>
</table>

**SNST statistics**

The default SNST configuration adds the following statistics. The statistics are incremented throughout the SNST control plans:

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST_ADD_REQ</td>
<td>SNST Add Friend Request</td>
</tr>
<tr>
<td>SNST_ADD_SUC</td>
<td>SNST Add Friend Success</td>
</tr>
<tr>
<td>SNST_BUNDLE_REQ</td>
<td>SNST Purchase Bundle Request</td>
</tr>
<tr>
<td>SNST_BUNDLE_SUC</td>
<td>SNST Purchase Bundle Success</td>
</tr>
<tr>
<td>SNST_C2C_REQ</td>
<td>SNST Click 2 Call Request</td>
</tr>
<tr>
<td>SNST_C2S_REQ</td>
<td>SNST Click 2 SMS Request</td>
</tr>
<tr>
<td>SNST_CHANGE_REQ</td>
<td>SNST Change Nickname Request</td>
</tr>
<tr>
<td>SNST_CHANGE_SUC</td>
<td>SNST Change Nickname Success</td>
</tr>
<tr>
<td>SNST_DENY_REQ</td>
<td>SNST Deny Friend Request</td>
</tr>
<tr>
<td>SNST_DENY_SUC</td>
<td>SNST Deny Friend Success</td>
</tr>
<tr>
<td>SNST_FRIEND_CALL</td>
<td>SNST Friend Call</td>
</tr>
<tr>
<td>SNST_FRIEND_SMS</td>
<td>SNST Friend SMS</td>
</tr>
<tr>
<td>SNST_INVITE_REQ</td>
<td>SNST Invite Friend Request</td>
</tr>
<tr>
<td>SNST_INVITE_SUC</td>
<td>SNST Invite Friend Success</td>
</tr>
<tr>
<td>SNST_NOMINATE_REQ</td>
<td>SNST Nominate Friend Request</td>
</tr>
<tr>
<td>SNST_NOMINATE_SUC</td>
<td>SNST Nominate Friend Success</td>
</tr>
<tr>
<td>SNST_NUMBERCHANGE_REQ</td>
<td>SNST Number Change Request</td>
</tr>
<tr>
<td>SNST_NUMBERCHANGE_SUC</td>
<td>SNST Number Change Success</td>
</tr>
<tr>
<td>SNST_PORTIN_REQ</td>
<td>SNST Port In Request</td>
</tr>
<tr>
<td>SNST_PORTIN_SUC</td>
<td>SNST Port In Success</td>
</tr>
<tr>
<td>SNST_PORTOUT_REQ</td>
<td>SNST Port Out Request</td>
</tr>
<tr>
<td>SNST_PORTOUT_SUC</td>
<td>SNST Port Out Success</td>
</tr>
<tr>
<td>Statistic</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>SNST_QUERY_REQ</td>
<td>SNST Query Friend Request</td>
</tr>
<tr>
<td>SNST_QUERY_SUC</td>
<td>SNST Query Friend Success</td>
</tr>
<tr>
<td>SNST_REGISTER_REQ</td>
<td>SNST Registration Request</td>
</tr>
<tr>
<td>SNST_REGISTER_SUC</td>
<td>SNST Registration Success</td>
</tr>
<tr>
<td>SNST_REMOVE_REQ</td>
<td>SNST Remove Friend Request</td>
</tr>
<tr>
<td>SNST_REMOVE_SUC</td>
<td>SNST Remove Friend Success</td>
</tr>
<tr>
<td>SNST_REREG_REQ</td>
<td>SNST ReRegistration Request</td>
</tr>
<tr>
<td>SNST_REREG_SUC</td>
<td>SNST ReRegistration Success</td>
</tr>
<tr>
<td>SNST_STOP_REQ</td>
<td>SNST Deactivation Request</td>
</tr>
<tr>
<td>SNST_STOP_SUC</td>
<td>SNST Deactivation Success</td>
</tr>
<tr>
<td>SNST_YES_REQ</td>
<td>SNST Registration Confirmation Request</td>
</tr>
<tr>
<td>SNST_YES_SUC</td>
<td>SNST Registration Confirmation Success</td>
</tr>
</tbody>
</table>

**Reports**

SNST has a set of standard reports that analyze the statistics gathered on the platform. For more information about reports, see *SNST Reports* (on page 108).

The statistics can be off-loaded from the database to an external statistical processing platform (for example, a data warehouse) for further analysis.

**EDRs**

EDRs are written whenever an action occurs in CCS that affects a wallet or subscriber, including:

- When a call is processed.
- When a SMS is sent or received.
- When a recharge is attempted.
- When a wallet changes state.

EDRs are automatically uploaded to the SMS where they are added to a centralized database. EDRs can be:

- Viewed per subscriber through the SMS screens.
- Post-processed in a flat file format, including being offloaded using SFTP.

For more information about the EDR format and EDR tags, see *EDR Reference Guide*.
Chapter 2

Social Networking Service Template

Overview

Introduction

This chapter describes services provided by the Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST).

In this chapter

This chapter contains the following topics.

Social Networking Service Template Description 11
SNST Self Care and IVR 15
SOAP Interface 15
SMS 15
Number Normalization 16

Social Networking Service Template Description

Introduction

The SNST is a standalone service that implements the NCC social networking model. Its configuration provides a fully functional and validated service. This can be deployed as is, or used as a framework to build a tailored solution.

For more information on the NCC social networking model, see SNST Social Business Intelligence (on page 2).

SNST components

SNST is deployed using the standard NCC components:

- Service Management System (SMS)
- Service Logic Controller (SLC)
- Voucher and Wallet Server (VWS)

The SMS is the central management system of the platform. It hosts the configuration and subscriber database, and provides access to the external world through provisioning interfaces and through a Graphical User Interface (UI). It is responsible for keeping all platforms in sync, and it also acts as a central collection point for alarms and statistics of the entire platform.

The SLC is the system that performs the actual call switching. It interfaces with the telephony network and executes the SNST service logic.

The VWS hosts all financial data used in SNST, such as Service Bundles and SNST subscriber wallets and balances.
Network interfaces

The SNST is set up and validated for GSM networks using the following interfaces and protocols, and NCC components:

- Sigtran SCTP/M3UA using the Sigtran component
- Standard Camel 2/3 using the ACS and CCS components
- ISUP using the VSSP component
- MAP 1/2/2+ SRI using the LCP component
- MAP 1/2/2+ SRI-SM, MO & MT, EMI and SMPP using the MM (Messaging Manager) component

Voice and IVR interfaces

This diagram illustrates the interfaces used to supply Voice and IVR services on a GSM network.

<table>
<thead>
<tr>
<th>Interface</th>
<th>Protocol</th>
<th>Description</th>
<th>Service</th>
<th>Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAMEL 2/3</td>
<td>Real Time call control</td>
<td>IVR Access</td>
<td>[CAP]</td>
</tr>
<tr>
<td>Interface</td>
<td>Protocol</td>
<td>Description</td>
<td>Service</td>
<td>Ref</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
<td>--------------------------------------------------</td>
<td>--------------------</td>
<td>--------</td>
</tr>
<tr>
<td>2</td>
<td>CS1-INAP</td>
<td>SLC-IVR Control operations</td>
<td>IVR Control</td>
<td>[CS1]</td>
</tr>
<tr>
<td></td>
<td>ISUP</td>
<td>UCAI ISUP Loopback for Call Origination</td>
<td>Click2Call Callback</td>
<td>[ISUP]</td>
</tr>
</tbody>
</table>

**HLR Interrogation**

SNST service logic often requires HLR interrogation. For example, HLR interrogation may be required for On-net and Off-net determination during Phone Friend Link Requests.

This table lists the protocol, description, and service used in HLR interrogation for a Subscriber lookup.

<table>
<thead>
<tr>
<th>Interface</th>
<th>Protocol</th>
<th>Description</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MAP 1/2/2+</td>
<td>LCP MAP SRI for A party location query</td>
<td>Subscriber lookup</td>
</tr>
</tbody>
</table>
### SMS

This diagram illustrates which interfaces are used to supply SMS services in a GSM network.

#### Interfaces

This table lists the protocol and service details for each interface used to supply SMS services in a GSM network.

<table>
<thead>
<tr>
<th>Interface</th>
<th>Protocol</th>
<th>Description</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MAP 1/2/2+</td>
<td>Short Message Submit operations MSC to SLC</td>
<td>SNST Self Care SMS prepaid</td>
</tr>
<tr>
<td>2</td>
<td>MAP 1/2/2+</td>
<td>Short Message Submit operations SLC to SMSC</td>
<td>SMS Notification SMS prepaid</td>
</tr>
<tr>
<td>3</td>
<td>MAP 1/2/2+</td>
<td>Short Message Delivery operations for FDA SLC to HLR</td>
<td>SMS Notification</td>
</tr>
<tr>
<td>4</td>
<td>MAP 1/2/2+</td>
<td>Short Message Delivery operations for FDA SLC -to GMSC</td>
<td>SMS Notification</td>
</tr>
</tbody>
</table>
### SNST Self Care and IVR

#### About IVR

IVR access assumes a CS1 compatible IVR is integrated with the SNST SLC nodes (either by using a direct M3UA connection, or by using signaling gateways).

The IVR is accessed by dialing a specific number or short code to trigger a dedicated IVR Self-Care control plan. From this control plan, a number of self-care tasks can be performed.

Multiple languages can be configured and the IVR control plan will prompt for language selection for subscribers with no preferred language set.

#### SOAP Interface

**Web service**

It is possible for the operator to implement a web-based Self Care interface outside SNST.

NCC makes available a set of Simple Object Access Protocol (SOAP) operations as part of the built-in Provisioning Interface (PI) and Open Services Development (OSD) interface. The operator uses the SOAP operations to execute Self Care commands on SNST.

The development, testing, integration and support of the web-based Self Care interface is the sole responsibility of the operator.

NCC is responsible for providing and supporting the PI commands and OSD interface that form the interfaces between the operator Self Care web interface and SNST.

For details, see *Web Portal* (on page 61).

#### SMS

**Introduction**

The Short Message Service (SMS) is the primary access method for subscriber self care actions, and allows SNST subscribers to manage their friends (for example, adding and removing friends).

<table>
<thead>
<tr>
<th>Interface</th>
<th>Protocol</th>
<th>Description</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>UCP/EMI</td>
<td>Short Message Submit operations SLC to SMSC</td>
<td>SMS Notification</td>
</tr>
<tr>
<td>6</td>
<td>SMPP</td>
<td>Short Message Submit operations SLC to SMSC</td>
<td>SMS Notification</td>
</tr>
<tr>
<td>7</td>
<td>UCP/EMI</td>
<td>Short Message Deliver operations SMSC to SLC</td>
<td>SNST Self-Care</td>
</tr>
<tr>
<td>8</td>
<td>SMPP</td>
<td>Short Message Deliver operations SMSC to SLC</td>
<td>SNST Self-Care</td>
</tr>
</tbody>
</table>
SMS self care process

SNST Self Care relies on short message (SMS) based interactions between the subscribers and the SNST. Unless explicitly stated otherwise, all interactions consist of the following stages.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The subscriber sends an SMS to one of the short-codes attributed to the SNST service. The SMS is typically structured as: &quot;KEYWORD + STRING/NUMBER&quot; For example, QUERY 0497972861. See SNST Keywords for a full description of each keyword.</td>
</tr>
<tr>
<td>2</td>
<td>The SMSC in the operator's home network submits or delivers the SMS to the SNST using one of the supported SMS protocols. <strong>Tip:</strong> You should define the SNST as an ASP in the SMSC and deliver the SMS using UCP or SMPP.</td>
</tr>
<tr>
<td>3</td>
<td>The SNST acknowledges the delivery (or submission) before processing the SMS message further. After processing completes, the SMS is discarded (it is not stored on the SNST, or forwarded on in the network).</td>
</tr>
<tr>
<td>4</td>
<td>The SNST analyzes the user data of the SMS message and applies the required logic, such as adding a phone friend.</td>
</tr>
<tr>
<td>5</td>
<td>The SNST creates a new SMS message to notify the subscriber of the result of the requested operation. This notification can also be an error, for example, to inform the subscriber the request was not understood.</td>
</tr>
</tbody>
</table>

SMS self care charging

You can charge for a number of SNST self care actions detailed throughout this guide, including:

- Registration confirmation
- Re-registration
- Purchasing service bundles, and so on

The charging is performed on the VWS nodes using named events and periodic charges. For more information on named events and periodic charges, see CCS User's Guide.

The operator is responsible for implementing appropriate prepaid and post-paid charging tariffs on the NCC platform.

Notification SMS messages

SNST can generate notification SMS messages. These can be submitted or delivered to the subscriber or a Short Message Service Centre (SMSC) using any of the protocols supported by Messaging Manager.

Number Normalization

Introduction

SNST receives phone numbers from various sources, such as:

- Calling and Called Party Numbers in Camel IDPs and MAP MO_FWD_SMs.
- Originating and Destination Addresses in UCP and SMPP Submit and Deliver operations.
- Numbers passed in SMS User Data, for example, in Phone Friend Request messages.
SNST normalizes all numbers and stores them in international format.

**Note:**
- Numbers in outbound MAP and CAMEL parameters should be sent in international format (NOA 1).
- Numbers in outbound UCP and SMPP parameters should be sent in ‘international unknown format’ (00CcNdcsN).
- Numbers in outbound SMS User Data text should be sent in international format.

### Inbound number formats

This table lists the supported inbound number formats and associated normalization rules.

<table>
<thead>
<tr>
<th>MAP TON</th>
<th>CAMEL NOA</th>
<th>Inbound Number</th>
<th>Rule</th>
<th>Example (CC=32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any</td>
<td>Any</td>
<td>Less than 7 digits</td>
<td>-</td>
<td>Considered short code</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>00CcNdcsN</td>
<td>Remove first two digits</td>
<td>0032497972861 becomes 32497972861</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>0NdcsN</td>
<td>Remove first digit, prefix with CC</td>
<td>0497972861 becomes 32497972861</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>CsNdcsN</td>
<td>-</td>
<td>32497972861</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>NdcsN</td>
<td>Prefix with CC</td>
<td>497972861 becomes 32497972861</td>
</tr>
<tr>
<td>Unknown</td>
<td>Unknown</td>
<td>Less than 7 digits</td>
<td>-</td>
<td>Considered short code</td>
</tr>
<tr>
<td>Unknown</td>
<td>Unknown</td>
<td>00CcNdcsN</td>
<td>Remove first two digits</td>
<td>0032497972861 becomes 32497972861</td>
</tr>
<tr>
<td>Unknown</td>
<td>Unknown</td>
<td>0NdcsN</td>
<td>Remove first digit, prefix with CC</td>
<td>0497972861 becomes 32497972861</td>
</tr>
</tbody>
</table>
Overview

Introduction

This chapter explains the different subscriber states for Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) subscribers. It lists the SNST keywords and describes the functions used to manage a subscriber's friends.

In this chapter

This chapter contains the following topics.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST Subscribers</td>
<td>19</td>
</tr>
<tr>
<td>SNST Keywords</td>
<td>21</td>
</tr>
<tr>
<td>SNST Service Registration</td>
<td>23</td>
</tr>
<tr>
<td>Phone Friend Lists</td>
<td>28</td>
</tr>
<tr>
<td>Phone Friend Links</td>
<td>28</td>
</tr>
<tr>
<td>Query Phone Friends</td>
<td>34</td>
</tr>
<tr>
<td>Number Change</td>
<td>37</td>
</tr>
<tr>
<td>Porting In and Out</td>
<td>37</td>
</tr>
<tr>
<td>Notification SMS</td>
<td>38</td>
</tr>
</tbody>
</table>

SNST Subscribers

Subscriber accounts

An SNST subscriber is identified by a unique E.164 number, which is referred to as the MSISDN of the subscriber.

A subscriber has a subscriber profile containing various information elements called profile tags that pertain specifically to them. The main tags are the SNST subscription state and phone friend lists. Initially no subscriber accounts exist on the SNST platform. Subscriber accounts and the associated subscriber profiles are created dynamically when a subscriber registers or receives a phone friend request.

All subscribers within the system start in an unregistered state. An unregistered subscriber becomes registered by sending the REGISTER keyword to the SNST service and confirming the request. A registered subscriber may become deactivated if they no longer wish to use the system or when the monthly subscription (periodic charge) to the SNST service fails to charge the subscriber's account. An unregistered subscriber may also directly become deactivated should he wish to no longer receive phone friend link requests and notifications.

Subscriber states

SNST subscribers can be in one of the following three states:

- Unregistered
- Registered
• Deactivated

**Unregistered state**

Subscribers who do not have an account on the SNST (that is, there are no subscriber details for them) are considered to be in the unregistered state. By default, all subscribers will have the service unregistered.

In the unregistered state, subscribers can:

• Receive phone friend requests and they can be added as a phone friend (this is a one way relationship).
• Deactivate the service and stop receiving phone friend link requests.
• Register for the SNST service.

**Note:** Unregistered subscribers cannot request phone friend links.

**Registered state**

Registered on-net subscribers have the service fully active. They can:

• Receive phone friend requests and they can be added as a phone friend (this is a two way relationship).
• Request phone friend link requests.
• Log in to the operator website to manage phone friend links.
• Deactivate the service and stop receiving phone friend link requests.

**Deactivated state**

The SNST service for deactivated subscribers is fully in-active. A deactivated subscriber:

• Cannot receive phone friend link requests
• Cannot request phone friend link requests
• Can be added as a phone friend link (one way relationship)
• Can reactivate the service through registration
Subscriber states diagram

Here is a diagram showing the different subscriber states.

SNST Keywords

Introduction

All SNST self care SMS operations, except 'Add Friend', start with a keyword that uniquely identifies the operation.
Note: INVITE and DENY requests are issued by forwarding a notification SMS received from the SNST. In this case the SMS is not required to start with the relevant keyword as this depends on the notification SMS definition.

Format

The keyword for each operation is configurable in the form of a single regular expression.

Example:

'QUERY' keywords = “QUERY|query|whois”

Configuring keywords

Keywords are stored in the CCS Global Profile and cannot be modified from the UI. The operator should define the required expression for each keyword before installation, and these are then automatically configured as required.

To change a keyword after installing SNST, you must use the `acsProfile` command line tool to update the CCS Global Profile.

Example: You can change the value for the YES keyword to "OK", then back to "YES" by entering the following `acsProfile` commands from the command line:

```bash
> ./acsProfile -E 1 -W 0x140013 -A "OK"
Connecting as smf/smf.
Decode CCS_GLOBAL_CONFIG.PROFILE where ID = 1
Profile is (356 bytes) and (19 tags).

Profile is (356 bytes) and (19 top level tags).

Tag      Desc                                               Len  HexData...
---------------------------------------------------------------------------
0x140013 SNST Keyword YES                                    2    4f 4b
  OK
...
> ./acsProfile -E 1 -W 0x140013 -A "YES"
Connecting as smf/smf.
Decode CCS_GLOBAL_CONFIG.PROFILE where ID = 1
Profile is (356 bytes) and (19 tags).

Profile is (356 bytes) and (19 top level tags).

Tag      Desc                                               Len  HexData...
---------------------------------------------------------------------------
0x140013 SNST Keyword YES                                    3    59 45 53
  YES
```

SNST keyword list

This table describes the function of each SNST keyword.

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Used to…</th>
<th>For more information, see</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGISTER</td>
<td>Register for the SNST service.</td>
<td>Registration process (on page 23)</td>
</tr>
<tr>
<td>YES</td>
<td>Confirm your registration request.</td>
<td></td>
</tr>
<tr>
<td>STOP</td>
<td>Deactivate the SNST service.</td>
<td>Deactivate SNST process (on page 26)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Removing Phone Friend links (on page 33)</td>
</tr>
</tbody>
</table>
SNST Service Registration

Introduction

A subscriber must first register with the SNST service to benefit from all the features of the service. For example, once registered an on-net subscriber will be able to make Phone Friend link requests.

Registration process

Here are the stages in the SMS SNST service registration process.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Request</td>
</tr>
</tbody>
</table>
|       | To register, a subscriber must send an SMS in the following format to the SNST
|       | REGISTER sent to shortcode |
|       | Where shortcode is the operator defined short code for the SNST. |
|       | **Example:** |
|       | REGISTER -> 777 |
| 2     | On-net/Off-net check |
|       | For a new subscriber (no subscriber account found), issue an HLR SRI query to determine the subscriber's IMSI. Extract the MNC from the IMSI, and compare it with a configurable operator MNC, to determine whether the registering subscriber is On-net or Off-net. |
|       | Registering subscribers with an existing account on the SNST (for example, subscribers who have registered or received a Phone Friend request) will have a Subscriber Profile entry indicating whether they are On-net or Off-net. (SNST Off-net Type profile tag). |
| 3     | Off-net error |
|       | If found to be unknown (failed HLR query), registration will fail and the registering subscriber will be sent a configurable SMS. |
|       | **Example:** Here is an example 'SNST Notif Err Unsupported MNC' notification. |
|       | I am sorry, your number could not be identified. |

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Used to...</th>
<th>For more information, see</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUERY</td>
<td>Query a single phone friend.</td>
<td>Querying a single Phone Friend (on page 34)</td>
</tr>
<tr>
<td>QUERY ALL</td>
<td>Query all phone friends.</td>
<td>Querying all Phone Friends (on page 35)</td>
</tr>
<tr>
<td>QUERY ADDED</td>
<td>Query phone friends added by SNST subscriber.</td>
<td>Querying added Phone Friends (on page 36)</td>
</tr>
<tr>
<td>REMOVE</td>
<td>Remove phone friend link.</td>
<td>Removing Phone Friend links (on page 33)</td>
</tr>
<tr>
<td>NOMINATE</td>
<td>Nominate a &quot;Best Phone Friend&quot;.</td>
<td>Nominate request (on page 50)</td>
</tr>
<tr>
<td>INVITE</td>
<td>Invite a friend to join the network.</td>
<td>Invitation to Join the Network (on page 49)</td>
</tr>
<tr>
<td>BUNDLE</td>
<td>Purchase a Service Bundle.</td>
<td>Purchasing service bundles (on page 46).</td>
</tr>
</tbody>
</table>
### Success

If the registering subscriber could be located, then perform the following actions:

- For ‘new’ (no account present on SNST platform), dynamically create the subscriber account.
- If the subscriber is On-net, update the Subscriber Profile associated with the registering subscriber’s MSISDN, set the SNST Service status to ‘Unregistered’ and set SNST Pending Registration to ‘True’.
- If the subscriber is Off-net, then update the Subscriber Profile associated with the registering subscriber’s MSISDN, set the SNST Service status to ‘Registered’ and set SNST Has Registered to ‘True’.

### Request confirmation

The SNST stores the service status, and sends a confirmation SMS to the On-net registering subscriber containing the following details:

- value of an optional one off charge in order to complete registration. This will be applied by return confirmation SMS

**Example:** Here is an example ‘SNST Notif Register Confirmation’ notification.

Thanks. reply YES in order to confirm the cost of 100c.

The cost value is defined in the **SNST Registration named event**. If the subscriber was registered previously and then deactivated, then the cost defined in the **SNST ReRegistration named event** will be used instead. This will be billed from the subscriber’s account on confirmation.

**Note:** If the subscriber is new to the NCC platform, then the registration cost is set in the ‘SUB_SNST_REGISTRATION_NONCMX’ control plan.

If the subscriber changes their mind and decides not to register, then they do not need to take any action. Their status will remain ‘Unregistered’. They can send a confirmation SMS, or a new registration request, at a later date.

Off-net subscribers do not need to send a request confirmation. They are immediately registered free of charge.

### Receive positive confirmation

If SNST receives a positive registration confirmation SMS, then perform the following actions on the registering subscriber’s profile:

- Set the SNST Service status to ‘Registered’.
- Set SNST Pending Registration to ‘False’.
- Set SNST Has Registered to ‘True’.

In addition, the SNST:

- Debits the subscriber’s account with the registration fee defined in the **SNST Registration** named event. If the subscriber was in a deactivated state before registration, then the subscriber’s account is debited with the re-registration fee defined in the **SNST ReRegistration** named event instead.
- Subscribes the subscriber’s account to the “SNST
### Stage 3: SNST Subscribers

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subscription On-net</strong> periodic charge.</td>
<td></td>
</tr>
<tr>
<td>- Sends the subscriber a single configurable notification SMS.</td>
<td></td>
</tr>
<tr>
<td><strong>Example:</strong> Here is an example ‘SNST Notif Register Suc’ notification.</td>
<td></td>
</tr>
<tr>
<td>Thanks. 0125559424 is registered. You can add numbers to your friend network by sending a number to 777.</td>
<td></td>
</tr>
<tr>
<td><strong>Internal failure</strong></td>
<td></td>
</tr>
<tr>
<td>- <strong>If an internal failure occurs, preventing the registration process from completing successfully, the SNST sends a single configuration failure notification SMS to the registering subscriber.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Example:</strong> Here is an example ‘SNST Notif Err Internal Failure’ notification.</td>
<td></td>
</tr>
<tr>
<td>I am sorry, your request could not be processed due to an internal error. Please try again later. Or contact customer service for more information.</td>
<td></td>
</tr>
</tbody>
</table>

**6 Monthly Fee**

Once the On-net subscriber has been registered, the SNST will debit a monthly fee from their account for the use of the SNST service. If this subscription is terminated, then the subscriber will be considered to be Unsubscribed.

While the monthly subscription is in place, the subscriber receives regular notification SMS messages. The following are some example notifications:

- **On successful monthly charge - SNST Notif Lifecycle On-net Suc:**
  Thanks - the friend network subscription charge has been successfully taken from your account - friend network discounts continue to apply!

- **On failed charge - SNST Lifecycle On-net Fail:**
  I am afraid the friend network subscription charge has not been taken due to a lack of funds. Please recharge your account within 10 days in order to continue to receive friend network discounts.

- **In grace period - SNST Notif Lifecycle On-net Gra:**
  You now have 5 days remaining to recharge your account before losing the friend network subscription after which you will no longer receive friend network discounts.

- **On loss of service - SNST Notif Lifecycle Srv Loss:**
  You are now unsubscribed from the friend network discounts. To re-subscribe and benefit from friend network discounts once again, please first recharge your account then text REGISTER to 777 or use the OperatorTel app on SNS.

**Note:** Notification SMS messages are configured on the **Notifications** tab of the ACS Resources screen. For more information, see **ACS User’s Guide**.
Double registration attempt

This table describes how the SNST will process a subsequent registration SMS when the registering subscriber is in one of the states listed in the table.

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unregistered</td>
<td>Prior to receiving registration confirmation:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● The SNST Service Status remains unchanged.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● The SNST sends a new confirmation request notification SMS to the registering subscriber, as per Request confirmation.</td>
<td></td>
</tr>
<tr>
<td>Registered</td>
<td>The SNST sends a configurable return SMS to the registering subscriber, such as the following 'SNST Notif Err Already Reg' notification: You are already registered! Discover the latest promotion on the OperatorTel app on SNS.</td>
<td></td>
</tr>
<tr>
<td>Deactivated</td>
<td>If the subscriber is:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● On-net, then the SNST sets the SNST Service Status to 'Unregistered' and the SNST Pending Registration to 'True' in the Subscriber Profile associated with the registering subscriber's MSISDN.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Off-net, then the SNST sets the SNST Service Status to 'Registered' and the SNST Has Registered to 'True' in the Subscriber Profile associated with the registering subscriber's MSISDN.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The SNST sends a new confirmation request notification SMS to the On-net registering subscriber, as per Request confirmation. If the subscriber has registered before, then the notification contains the re-registration cost (this may be different to the initial registration cost). On receipt of a positive registration confirmation SMS, the SNST will debit the re-registration fee from the subscriber's account. The amount to be debited is defined in the SNST ReRegistration named event.</td>
<td></td>
</tr>
</tbody>
</table>

Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.

Deactivate SNST process

Both unregistered and registered subscribers may wish to deactivate the SNST service. When deactivated, the subscriber will not:

- Receive Phone Friend link requests notifications
- Be able to request Phone Friend links
- Receive Phone Friend link discounts
- Pay a monthly fee if the subscriber is registered previously and On-net

While deactivated, the existing Phone Friend lists are maintained and will be restored when re-registering. Registered subscribers can still create Phone Friend links with deactivated subscribers, but only the registered subscriber will benefit from Phone Friend link discounts.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Request</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In order to deactivate, a subscriber must send an SMS in the following format to an operator defined short code: 3000 activating your phone number.</td>
<td></td>
</tr>
</tbody>
</table>
## Chapter 3

### SNST Subscribers

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
</table>
| STOP sent to short_code  
Where short_code is the operator defined code for the subscriber  
Example: STOP -> 777 | |
| 2 No profile | If the requesting subscriber:  
- Has no existing SNST account (Subscriber Profile), then SNST sends a single configurable notification SMS to the subscriber.  
Example: Here is an example ‘SNST Notif Err Registration Req’ notification. I am sorry, you must be registered to use the friend network service. To register, please send REGISTER to 777 or use the OperatorTel app on SNS.  
- Already deactivated  
- Is already in deactivated state, then SNST sends a single configurable notification SMS to the subscriber.  
Example: Here is an example of the ‘SNST Notif Err Already Deact’ notification. I am sorry, you have already deactivated the service. |
| 3. Deactivate | If the requesting subscriber is in either Unregistered or Registered state, then the SNST will:  
- Change SNST Service Status in the Subscriber Profile to ‘Deactivated’  
- Send a configurable notification SMS to the subscriber. A different notification SMS can be configured for previously registered or previously unregistered subscribers.  
Example notification SMS:  
- Previously Registered - ‘SNST Notif Deactivate Suc (Reg)’ Service deactivated. You will receive no further friend network discounts or notifications. To reactivate this service send REGISTER to 777 or use the OperatorTel app on SNS  
- Previously Unregistered - ‘SNST Notif Deactivate Suc (Unreg)’ Service deactivated. You will receive no further friend notifications. Send REGISTER to 777 to register or use the OperatorTel app on SNS  
If the requesting subscriber was in Registered state and On-net, then the monthly subscription fee will be terminated. |

**Note:** You configure notification SMS messages on the Notifications tab of the ACS Resources screen. For more information, see *ACS User’s Guide.*
Reregistering SNST service

Deactivated subscribers who were previously Registered may wish to re-activate their SNST subscription. They can do so by sending an SMS with the ‘REGISTRATION’ keyword. If required, SNST will apply a re-registration charge, which can be different to the original registration charge. For more information, see Registration request.

Phone Friend Lists

About phone friend lists

A subscriber’s Phone Friends are stored in a Phone Friend list in the Subscriber Profile on the SNST. This Phone Friend list is composed of three individual Phone Friend lists to allow different treatment and reporting based on the number of Phone Friend requests received and the number of Phone Friend requests sent.

The Phone Friend Requests lists are:

- **Added On-Net** – Stores Phone Friend requests made by the subscriber to other On-net subscribers.
- **Added Off-Net** – Stores Phone Friend requests made by the subscriber to subscribers from other Off-net networks.
- **Received** – Stores Phone Friend requests received from other subscribers.

List limits

Phone Friend lists have the following size limitations:

- A configurable limit for the sum of both Added lists. This is set to 10 by default.
- A configurable limit for the Received list. This is set to 50 by default.

When a list limit is reached, no new entries can be added to the list.

Phone Friend Links

Introduction

In this topic ‘Subscriber A’ is used to identify the subscriber making a Phone Friend request, and ‘Subscriber B’ is used to identify the subscriber receiving the Phone Friend request.

Creating phone friends using sms

Here are the stages in the process of creating Phone Friends using SMS.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1. Request | A registered subscriber requests a new Phone Friend link by sending an SMS in the following format:  
\[\text{phone\_friend\_msisdn} \text{ \text{sent to} \text{ \text{shortcode}}}\]  
Where:  
- \[\text{phone\_friend\_msisdn}\] is the MSISDN of the new phone friend  
- \[\text{shortcode}\] is the operator defined short code for the SNST service.  
**Example:**  
3247942861 \rightarrow 777 |
<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2     | Registration check | Only registered subscribers are allowed to request Phone Friend links. If the SNST state for the requesting subscriber is not 'Registered', then the SNST denies the request and sends a configurable notification SMS to the requesting subscriber.  
**Example:** Here is an example 'SNST Notif Err Registration Req' notification.  
I am sorry, you must be registered to use the friend network service. To register, please send REGISTER to 777 or use the OperatorTel app on SNS. |
| 3     | Phone Friend Count check | If the sum of the current Added lists sizes equals or exceeds the configurable maximum Added list size, then the SNST denies the request and sends a configurable notification SMS to the requesting subscriber.  
**Example:** Here is an example 'SNST Notif Add B Fail (no space)' notification.  
I am sorry, you have already added the maximum of 20 numbers to your friend network. To add additional numbers, you must first remove a number by sending REMOVE + number of friend to remove to 777! You can also manage your friend network using the OperatorTel app on SNS. |
| 4     | Daily Friend Changes limit check | If the number of friend changes (by adding or removing friends) exceeds the maximum number of changes within 24 hours, then the SNST denies the request and sends a configurable notification SMS to the requesting subscriber. The default limit is 10.  
**Example:** Here is an example 'SNST Notif Add A Fail (Daily Max)' notification.  
You have exceeded the maximum of 10 friend changes in 24h. Please try again later. |
| 5     | Normalize number check | Apply the following checks to the normalized MSISDN of Subscriber B. Is the number:  
- longer than a configurable minimum  
- shorter than a configurable maximum  
If the number is not valid, the SNST sends a configurable notification SMS to subscriber A.  
**Example:** Here is an example 'SNST Notif Add B Fail (Invalid)' notification.  
I am sorry. 12345 is an invalid number. Please check and try again. |
| 6     | List check | Look up the MSISDN of Subscriber B in the Phone Friend lists of Subscriber A. If the MSISDN already exists as a Phone Friend entry in any Phone Friend list, the SNST sends a configurable notification SMS to Subscriber A.  
**Example:** Here is an example of the notification 'SNST Notif Add B Fail (exists)'.  
0987654321 is already in your friend network - you already receive a discount when calling this friend. |
| 7     | Error | If there is an internal error, for example:  
- Failure to normalize the number |
<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NCC Social Networking Service Template User’s and Technical Guide</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
</table>
| 8      | Create Subscriber B  
If:  
- subscriber A is in ‘Registered’ state  
- the MSISDN of Subscriber B is valid and not an existing Phone Friend of Subscriber A  
- Subscriber B is a new subscriber (no account on SNST)  
Then the SNST performs the following actions:  
- Perform On-net/Off-net determination for Subscriber B as per Phone friend count check.  
- Dynamically create an account for Subscriber B. If subscriber B is On-net, then subscriber B’s profile will be updated. The SNST sets Service Status to ‘Unregistered’ and SNST Pending Registration to ‘True’. If Off-net, the SNST updates the Subscriber Profile Off-net tag, and immediately sets SNST Service Status to ‘Registered’.  
- Add the MSISDN of Subscriber A to the Received Phone Friend List for Subscriber B. |
| 9      | Update Subscriber B  
If:  
- subscriber A is in ‘Registered’ state  
- the MSISDN of Subscriber B is valid and not an existing Phone Friend of Subscriber A  
- Subscriber B is an existing subscriber (account on SNST)  
Then SNST adds the MSISDN of Subscriber A to the Received Phone Friend List for Subscriber B. |
| 10     | Subscriber B Received list full  
If the received list limit for a subscriber is exceeded, then SNST sends a configurable notification SMS to Subscriber A.  
Example: Here is an example ‘SNST Notif Add A Fail (B Rec F)’ notification.  
Sorry. You cannot add 0987654321 to your friend network because his received list is already full. |
### Stage 11: Update Subscriber A

If Subscriber B was successfully updated, as per Create, or Update Subscriber B, the SNST performs the following actions:

- Extract the On-net/Off-net status of Subscriber B from their Subscriber Profile.
- If Subscriber B is:
  - On-net, add the MSISDN of Subscriber B to the Added On-net list of Subscriber A.
  - Off-net, add the MSISDN of Subscriber B to the Added Off-net list of Subscriber A.
- Increment the daily friend changes counter for Subscriber A by one.

### Stage 12: Success

After successfully updating the Profiles of both Subscribers, the SNST performs the following actions:

- Send Subscriber A a configurable notification SMS.
- If Subscriber B is On-net, send Subscriber B a configurable notification SMS. This SMS must include the REMOVE keyword and the MSISDN of Subscriber A. No SMS will be sent to Subscriber B if Subscriber B is Off-net.

Different notifications are configurable depending on the state of Subscriber B. See *Success notification SMS messages* (on page 31).

#### Success notification SMS messages

- **Example notification SMS sent to Subscriber A, depending on state of Subscriber B.**

<table>
<thead>
<tr>
<th>B is...</th>
<th>Example SMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-net</td>
<td>Thanks 0987654321 from operator 122 has been added to your friend network and friend discounts now apply. Refer your friend to OperatorTel by forwarding this SMS to 777 or use the OperatorTel app on SNS. There is a reward of 10 friend minutes for every succesful referral.</td>
</tr>
<tr>
<td>Registered</td>
<td>Thanks. 0987654321 has been added to your friend network and friend discounts now apply. 0987654321 now also receives a discount when calling you.</td>
</tr>
<tr>
<td>Unregistered</td>
<td>Thanks. 0987654321 has been added to your friend network and friend discounts now apply. 0987654321 will receive a discount when calling you when they register.</td>
</tr>
<tr>
<td>Deactivated</td>
<td>Thanks. You have added 0987654321 to your friend network and friend discounts now apply. If 0987654321 registers, they will receive a discount calling you.</td>
</tr>
</tbody>
</table>

- **Example notification SMS sent to Subscriber B, depending on state of Subscriber B.**

<table>
<thead>
<tr>
<th>B is...</th>
<th>Example SMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered</td>
<td>Hi. You have received my number into your friend network &amp; you now receive a friend discount when calling me. I also receive a friend discount when calling you. To reject this request, forward this SMS or send REMOVE 0123456789 to 777</td>
</tr>
<tr>
<td>Unregistered</td>
<td>Hi. You have received my number into your friend network. I receive a discount when calling you - if you register, you will...</td>
</tr>
</tbody>
</table>

---

Chapter 3, SNST Subscribers 31
(SNST Notif Add B Suc (Unreg))

Deactivated  No SMS is sent.

Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.

Friend links using business card request

A registered SNST subscriber can make a Phone Friend request by sending the business card of his Phone Friend, in an SMS, to the SNST shortcode. This is an alternative to sending an SMS with the Phone Friend MSISDN.

VCARD and HCARD standards are supported.

Business card support is limited to business card with a single MSISDN, or a single numerical string which can represent an MSISDN. If more than a single numerical string is found, the request will fail and a configurable notification SMS will be sent to the subscriber.

Rejecting Phone Friend links

A registered subscriber will automatically have a Subscriber Profile on the SNST. The subscriber can reject a received friend request at any time, by forwarding the received notification SMS back to the SNST short code. This is called DENY request.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Request</td>
</tr>
</tbody>
</table>
|       | Phone Friend request notification SMS back to the SNST using a configurable short code.  
|       | **Example:** Here is an example of the notification 'SNST Notif Add B Suc (Reg)'.  
|       | Hi. You have received my number into your friend network & you now receive a friend discount when calling me. I also receive a friend discount when calling you. To reject this request, forward this SMS or send REMOVE 0123456789 to 777  
|       | Subscribers in the 'Registered' state can reject Phone Friend requests. |
| 2.    | No phone friend  
|       | If the MSISDN (Subscriber B) in the DENY request is not found in the Received List of Subscriber A, the SNST sends a configurable notification SMS to Subscriber A.  
|       | **Example:** Here is an example of the notification 'SNST Notif Deny Fail (Not Found)'.  
|       | I am sorry 0123456789 is not in your friend network. View your phone friend network using the OperatorTel app on SNS or send QUERY to 777  
|       | Remove Phone Friend link  
|       | If the MSISDN (Subscriber B) in the DENY request is found in the Received List of Subscriber A, the SNST performs the following actions:  
|       | • Remove the MSISDN of Subscriber:  
|       |  ▪ B from the Received List of Subscriber A.  
|       |  ▪ A from the Added List of Subscriber B (On or Off net)  
|       | • Send a single notification SMS to Subscriber A.  
|       | **Example:** Here is an example of the notification 'SNST Notif Deny A Suc'.  
|       | Thanks. You have deleted 0123456789 from your friend network. You no longer receive friend discounts when calling each other. |
### Removing Phone Friend links

A registered SNST Subscriber can remove existing Phone Friend links, whether they are Phone Friend links that they added (Added lists) or received (Received lists).

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Request</td>
</tr>
<tr>
<td></td>
<td>The subscriber sends an SMS in the following format to the SNST:</td>
</tr>
<tr>
<td></td>
<td>REMOVE phone_friend_MSISDN sent to short_code</td>
</tr>
<tr>
<td></td>
<td>Where:</td>
</tr>
<tr>
<td></td>
<td>• phone_friend_MSISDN is the MSISDN of the phone friend.</td>
</tr>
<tr>
<td></td>
<td>• short_code is the operator defined short code for the SNST service</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
</tr>
<tr>
<td></td>
<td>REMOVE 32497972861 -&gt; 777</td>
</tr>
<tr>
<td>2</td>
<td>Registration check</td>
</tr>
<tr>
<td></td>
<td>Only registered subscribers are allowed to remove Phone Friends. If the SNST state of the requesting subscriber is not 'Registered', then the SNST sends a configurable notification SMS to the requesting subscriber.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
</tr>
<tr>
<td></td>
<td>Here is an example of the notification 'SNST Notif Err Registration Req'.</td>
</tr>
<tr>
<td></td>
<td>I am sorry, you must be registered to use the friend network service. To register, please send REGISTER to 777 or use the OperatorTel app on SNS.</td>
</tr>
<tr>
<td>3</td>
<td>Result</td>
</tr>
<tr>
<td></td>
<td>A notification SMS is sent to Subscriber A. See Result notification SMS below.</td>
</tr>
</tbody>
</table>

### Result notification SMS

Depending upon the result of the REMOVE request, the SNST will send the following notification SMS to Subscriber A.

<table>
<thead>
<tr>
<th>Result</th>
<th>If...</th>
<th>Example notification SMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily max exceeded (SNST Notif Add A Fail (Day Max))</td>
<td>The number of friend changes (by adding or removing friends) has exceeded the limit of 10 within 24 hours.</td>
<td>You have exceeded the maximum of 10 friend changes in 24h. Please try again later.</td>
</tr>
<tr>
<td>No Phone Friend (SNST Notif Remove Fail (NotFound))</td>
<td>The MSISDN (Subscriber B) in the REMOVE request is not found in Subscriber A’s Phone Friend Lists</td>
<td>I am sorry, 32497972861 does not exist in your friend network. Use the OperatorTel app on SNS to view your friend network &amp; discover other promotional offers.</td>
</tr>
<tr>
<td>Success</td>
<td>If the MSISDN (Subscriber B) in the REMOVE request is found in</td>
<td></td>
</tr>
</tbody>
</table>
Subscriber A’s Phone Friend Lists, the following actions will take place:
- The MSISDN of Subscriber B is removed from Subscriber A’s Phone Friend Lists.
- The MSISDN of Subscriber A is removed from Subscriber B’s Phone Friend Lists.

(SNST Notif Remove A Suc) • A single notification SMS is sent to Subscriber A

(SNST Notif Remove B Suc) • A single notification SMS is sent to Subscriber B.

Thanks. You have removed 32497972861 from your friend network. You no longer receive a friend discount to this number.

I am sorry, 0123456789 has been removed from your friend network. You no longer receive a discount to this number.

Query Phone Friends

Introduction

In this topic Subscriber A is used to identify the subscriber requesting the query, and Subscriber B is used to identify the subscriber being queried.

Querying a single Phone Friend

Here are the stages in the process for a registered subscriber to query the SNST for a single Phone Friend.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SMS Request</td>
</tr>
<tr>
<td></td>
<td>The subscriber sends an SMS in the following format to the SNST:</td>
</tr>
<tr>
<td></td>
<td>\textbf{QUERY} \textit{phone_friend_MSISDN} sent to \textit{short_code}</td>
</tr>
<tr>
<td></td>
<td>Where:</td>
</tr>
<tr>
<td></td>
<td>\textit{phone_friend_MSISDN} is the MSISDN of the phone friend.</td>
</tr>
<tr>
<td></td>
<td>\textit{short_code} is the operator defined short code for the SNST service</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
</tr>
<tr>
<td></td>
<td>\textbf{QUERY} 32497972861 \textbf{-&gt;} 777</td>
</tr>
<tr>
<td>2</td>
<td>Registration check</td>
</tr>
<tr>
<td></td>
<td>Only registered subscribers are allowed to submit queries. If the SNST state of the requesting subscriber is not ‘Registered’, then the SNST sends a configurable notification SMS to the requesting subscriber.</td>
</tr>
<tr>
<td></td>
<td>The SNST looks up the MSISDN of Subscriber B in all the Phone Friend Lists (Added On-net, Added Off-net and Received) of Subscriber A.</td>
</tr>
<tr>
<td></td>
<td>Example: Here is an example of the notification 'SNST Notif Err Registration Req'.</td>
</tr>
<tr>
<td></td>
<td>I am sorry, you must be registered to use the friend network service. To register, please send REGISTER to 777 or use the OperatorTel app on SNS.</td>
</tr>
<tr>
<td>3</td>
<td>Result</td>
</tr>
<tr>
<td></td>
<td>SNST sends a notification SMS to Subscriber A. See Query notification SMS below.</td>
</tr>
</tbody>
</table>
Query notification SMS
Depending upon the result of the query, the following notification SMS will be sent to Subscriber A.

<table>
<thead>
<tr>
<th>Result</th>
<th>If...</th>
<th>Example notification SMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Phone Friend (SNST Notif Query Fail (Not Found))</td>
<td>The MSISDN of Subscriber B is not found in any Phone Friend List of Subscriber A.</td>
<td>I am sorry, 0123456789 is not in your friend network. To add this number, send their number to 777 or use the OperatorTel app on SNS.</td>
</tr>
<tr>
<td>Error (SNST Notif Query Fail (Invalid))</td>
<td>There is an error in the QUERY request sent, such as an invalid number.</td>
<td>Sorry, I did not understand your query request. You may only query for a single number or ALL of your friends.</td>
</tr>
<tr>
<td>Success (SNST Notif Query Suc (Single))</td>
<td>Subscriber B is a Phone Friend of Subscriber A</td>
<td>Thanks! 0123456789 already exists in your friend network and friend discounts apply when calling this number.</td>
</tr>
</tbody>
</table>

Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User’s Guide.

Querying all Phone Friends
The following stages describe the process used to query all the Phone Friends for a registered SNST subscriber.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1 | SMS Request | The subscriber sends an SMS in the following format to the SNST:  
QUERY ALL sent to short_code  
Where short_code is the operator defined short code for the SNST service.  
Example:  
QUERY ALL -> 777 |
| 2 | Registration check | Only registered subscribers are allowed to query. If the SNST state of the requesting subscriber is not 'Registered', a configurable notification SMS is sent to the requesting subscriber.  
The SNST looks up all Phone Friend entries in all of Subscriber A’s Phone Friend Lists (Added On-net, Added Off-net and Received).  
Example: Here is an example of the notification ‘SNST Notif Err Registration Req’.  
I am sorry, you must be registered to use the friend network service. To register, please send REGISTER to 777 or use the OperatorTel app on SNS. |
| 3 | Result | The SNST sends a notification SMS to Subscriber A. See Query notification SMS below. |
Query notification SMS

Depending upon the result of the query, the following notification SMS is sent to Subscriber A.

<table>
<thead>
<tr>
<th>Result</th>
<th>If...</th>
<th>Example notification SMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Phone Friend (SNST Notif Query Fail (NoFriends))</td>
<td>No Phone Friends entries are found in any of the Phone Friend Lists.</td>
<td>I am sorry, you currently have no numbers in your friend network. Simpily text a number to 777 to add a number to your friend network. I am sorry, your request could not be processed due to an internal error. Please try again later. Or contact customer service for more information.</td>
</tr>
<tr>
<td>Error (SNST Notif Err Internal Failure)</td>
<td>There is an internal error while retrieving the Phone Friend Lists of Subscriber A</td>
<td></td>
</tr>
<tr>
<td>Success</td>
<td>If Subscriber A has existing Phone Friend links, two configurable notification SMS messages will be sent to Subscriber A.</td>
<td>You have 2 numbers in your friend network. On-net: 098765432 Off-net: 058757644</td>
</tr>
<tr>
<td>(SNST Notif Query OnNet Added)</td>
<td>• A first SMS returns the Added Phone On-net and Off-net Friends</td>
<td>You have received 2 numbers into your friend network. 012345, 0123456</td>
</tr>
<tr>
<td>(SNST Notif Query Received)</td>
<td>• A second SMS returns the Received Phone Friends</td>
<td></td>
</tr>
</tbody>
</table>

Note: Notification SMS messages are configured on the **Notifications** tab of the ACS Resources screen. For more information, see *ACS User's Guide*.

Phone friend list length

When using the MAP protocol, the result notification can span several concatenated SMS messages.

The number of concatenated SMS messages depends on the actual number of Phone Friends, the SMS template, MSISDN length as well as the required alphabet.

An SMS notification can span a maximum of three individual SMS messages. Therefore, when the subscriber has large Friends Lists, the number of Phone Friends in result notifications (SNST Notif Query OnNet Added, SNST Notif Query Received) is limited to a total of 15 Friends per notification.

If the limit is exceeded, the SNST sends a configurable notification SMS that includes the total number of Phone Friends only.

Example: Here is an example of the notification ‘SNST Notif Query Fail (Too Many)’.

Thanks, you have 99 numbers in your friend network - you are too popular to display via SMS! To view your friend network, please use the OperatorTel app on SNS. To query a single number, send a SMS with QUERY + number to 777.

Note: Notification SMS messages are configured on the **Notifications** tab of the ACS Resources screen. For more information, see *ACS User's Guide*.

Querying added Phone Friends

A registered subscriber can query the SNST for only the Phone Friends that he has added himself.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The subscriber sends an SMS in the following format to the SNST:</td>
</tr>
<tr>
<td></td>
<td>QUERY ADDED sent to short_code</td>
</tr>
<tr>
<td></td>
<td>Where short_code is the operator defined short code for the</td>
</tr>
</tbody>
</table>
### Number Change

#### Logic trigger

When the MSISDN of an on-net subscriber changes, the operator shall ensure the ‘Change Number’ logic on the SNST is executed. This logic can be initiated using either XML/SOAP (in the Provisioning Interface) or SNST UI.

The request will have the old and new MSISDNs as parameters.

If no SNST account exists for the old MSISDN, then no changes need to be done and a corresponding response shall be returned.

#### Logic

On receiving a Number Change request, the SNST will execute the following logic:

- Cycle through all Phone Friends in all Phone Friend lists of the subscriber.
- Update the Phone Friend lists of all Phone Friends with the subscriber's new MSISDN
- Send a configuration notification SMS to all Phone Friends.
  
  **Example:** Here is an example of the notification ‘SNST Notif Number Change Suc’.
  
  Your friend 098765432 has changed numbers. You can now reach your friend on the following number: 098765435

- Change the MSISDN in the subscriber’s SNST profile to the new MSISDN.

### Porting In and Out

#### Porting in

When an off-net subscriber churns and is ported into the on-net operator’s network, any existing port-in processes are executed by the on-net operator. If the ported subscriber already has an SNST account, specific port-in logic must be triggered in the SNST for this subscriber.

When an off-net subscriber is ported in, the operator must ensure the ‘Port In’ logic on the SNST is executed. This logic can be initiated using either the Provisioning Interface (PI) XML/SOAP or the SNST UI.
The request will include the ported MSISDN, as a parameter:

- If no SNST account exists for the MSISDN, then no changes need to be done and a corresponding response will be returned.
- If MNP is not supported, then the subscriber will receive a new MSISDN and therefore the ‘Change Number’ logic will also be triggered.

### Porting in logic

On receiving a Port In request, the SNST will execute the following logic:

- Update the ‘off-net’ flag in the Subscriber Profile.
- Check for Referral Reward eligibility and optionally apply the referral logic (see *Best Phone Friend Referral Atom* (on page 50)).
- Optionally apply the empathy joining reward (see *Empathy Atom Joining Reward* (on page 52)).
- Move the number of the subscriber that is porting in, from the Added off-net list to Added on-net list of the friends in the received list of this subscriber.

### Porting out

When an on-net subscriber churns and is ported out to an off-net network, any existing port-out processes would be executed by the on-net operator. If the ported subscriber has an SNST account, specific port-out logic must be triggered in the SNST for this subscriber.

When an on-net subscriber is ported out, the operator must ensure the ‘Port Out’ logic on the SNST is executed. This logic can be initiated via either PI XML/SOAP or SNST UI.

The request will have the ported MSISDN as a parameter:

- If no SNST account exists for the MSISDN, then no changes need to be done and a corresponding response will be returned.
- If MNP is not supported, then the subscriber will receive a new MSISDN and therefore the ‘Change Number’ logic will be triggered.

### Porting out logic

On receiving a Port Out request, the SNST will execute the following logic:

- Update the ‘off-net’ flag in the Subscriber Profile.
- Move the number of the subscriber that is porting out, from the Added on-net list to Added off-net list of the friends in the received list of this subscriber.

### Notification SMS

#### Notification SMS delivery paths

Delivery of Notification SMS messages generated by the SNST is supported using a configurable combination of the following paths:

- MAP Direct delivery to the handset (FDA). MAP SRI_SM + MAP MT_FWD_SM
- MAP Submit to SMSc. MAP MO_FWD_SM
- UCP Submit to SMSc. UCP-51
- SMPP Submit to SMSc. SMPP_Submit
Notification message length and text

Unless explicitly stated otherwise, all notification SMS messages are configurable, with mandatory variable parts.

**Example SMS:** Hi. You have received my number into your friend network & you now receive a friend discount when calling me. I also receive a friend discount when calling you. To reject this request, forward this SMS or send REMOVE 0123456789 to 777

The total length of an SMS notification can span a maximum of three individual SMS messages.

Where possible, the length of an SMS notification should be 120 bytes or less, to avoid multiple SMS concatenation, and MAP message or SCCP segmentation, or both. A message length of 120 bytes is equivalent to 137 characters in a 7-bit ASCII alphabet. Other alphabets are supported but not recommended because of potential message concatenation and segmentation problems.

**Note:** Notification SMS messages that have not been configured (for example, where no text has been provided) will not be sent.

Notification SMS configuration

**Note:** Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see *ACS User's Guide.*
Chapter 4

Phone Friend Link Benefits

Overview

Introduction

When a registered SNST subscriber makes a HPLMN call or sends an SMS to one of their Phone Friends, they will benefit from a preferential tariff or discount.

The discounts and tariffs for SNST are configured in the Rating Management screens in CCS. For more information, see CCS Rating Management User's Guide.

In this chapter

This chapter contains the following topics.

Voice Services 41
SMS 42

Voice Services

About voice services

SNST offers an HPLMN Mobile Originating (HPLMN MO) voice service that provides the ability to charge for a call initiated by a subscriber when they are in the home network (HPLMN). A discount will be given if the called number is a SNST Friend of the calling subscriber.

The voice service assumes that the calling subscribers are prepaid subscribers on the NCC platform and that they have been allocated the SNST product type. When off-net subscribers port-in they become prepaid subscribers.

If you have both prepaid and post-paid subscribers using SNST, then you will need to extend the SNST configuration to prevent prepaid billing of these subscribers in the NCC system. You should include the following items in your configuration:

- A mechanism for routing post-paid SNST subscribers to the NCC platform. This should be done by the operator on the network.
- A mechanism of mediation of the EDRs generated to the post-paid billing applications. This should be done by the operator on the external mediation system.
- In CCS set up either post-paid Limit Type balance types or a separate product type for post-paid subscribers with its own voice control plan. The voice control plan should not bill the call on the VWS but should perform a TCAP hand-over to the network (for example, where the called Party number in the Camel IDP is prefixed with a specific value to indicate that the called party belongs to a friend list of the calling party number). For more information on configuring balance types and product types in CCS, see CCS User's Guide.

Note: The SNST template does not provide this configuration and the details for this configuration are not included in the scope of this guide.
Voice call rating

When a SNST subscriber initiates a voice call, the call is rated in NCC and the SNST charges the subscriber for the cost of the call. This is part of the standard NCC Rating Management functionality. For information on how to configure the tariffs used in rating, see CCS Rating Management User’s Guide.

When rating a call, NCC first determines the product type of the calling subscriber. Subscribers in SNST are automatically provisioned with a product type named ‘SNST’. This product type references the ‘Default SNST VOICE_MO’ tariff plan that is linked to a rate table.

NCC then proceeds to determine the following two call parameters:

- The Location that the call is coming from.
- The Destination that is being called.

It does this by matching specific network parameters (for example, MSC address, Called Party Number in the Camel IDP) against a logical tree structure that is linked to the selected rate table. The logical tree structure is called the geography set and the SNST uses the ‘SNST Geography Set’.

The combination of the rate table, the call location and the call destination allows NCC to select the appropriate rate for the call.

The call rate is composed of a number of configurable parameters, including:

- Call cost – can be a flat rate, or a variable rate during the call (for example, first minute 100c, rest of the call 50c per minute)
- Maximum cost of the call (can be set to unlimited)
- Minimum length of the call (can be set to zero)
- Billing resolution – per second rating, per minute rating, and so on

Additionally, a balance cascade must be defined for each rate. This is a list of balances that define the balances to use to pay for the service, and the order in which the balances should be used.

A discount can be given to the call rate, based on time bands (for example, time of day, day of week, holiday), and based on a discount node in the control plan being used. SNST determines via the control plan, if the called party number belongs to one of the friends in the calling subscribers friend lists. If this is the case, then the control plan logic applies a discount through the discount node.

Flash SMS notification SMS

As part of the voice service logic, the SNST can be configured to send a configurable flash notification SMS detailing the Phone Friend and Phone Friend list after the call has been completed.

Example: Here is an example of the flash notification ‘SNST Notif Post Call OffNet’:

You have successfully called your Off-Net fiend 32497972861

SMS

About SMS services

For the SMS service the SNST will expect to receive a MAP MO_FWD_SM from the originating (V)MSC.

The operator shall ensure SMS traffic from subscribed SNST subscribers is routed to the SNST.

The SMS service assumes that the calling subscribers are prepaid subscribers on the NCC platform and that they have been allocated the SNST product type. When off-net subscribers port-in they become prepaid subscribers.
If you have both prepaid and postpaid subscribers using SNST, then you will need to extend the SNST configuration to prevent prepaid billing of these subscribers in the NCC system, by including in your configuration:

- A mechanism for routing post-paid SNST subscribers to the NCC platform. This should be done by the operator on the network.
- A mechanism of mediation of the EDRs generated to the postpaid billing applications. This should be done by the operator on the external mediation system.
- In CCS set up either post-paid Limit Type balance types or a separate product type for post-paid subscribers with its own SMS control plan. The SMS control plan should not bill the SMS on the VWS but should forward the SMS with the Recipients number prefixed with a specific value to indicate that the called party belongs to a friend list of the calling party number. For more information on configuring balance types and product types in CCS, see "CCS User's Guide."

**Note:** The SNST template does not provide this configuration and therefore this configuration is not included in the scope of this guide.

### MO_FWD_SM

To support SNST analysis and billing the MAP MO_FWD_SM shall be routed to the SNST platform. The following assumption will be made:

- sm-RP-OA contains the MSISDN of Originator.
- sm-RP-DA contains the MSISDN of the Recipient.
- SCCP CallingPartyAddress contains the (V)MSC address.

### SMS rating

When a SNST subscriber sends an SMS, NCC will rate the SMS and charge the subscriber for the cost of the SMS.

NCC matches the MSC address and the MSISDN of the recipient against an ordered list of regular expression rules. This list is configured in the Short Message Charging Bundle (SMCB) application. See "NCC Short Message Charging Bundle User's & Technical Guide" for more information how to configure this list.

The best matching rule is selected, and the named event for the rule is applied. For example, the 'SNST SMS' named event may be applied when one subscriber texts another subscriber.

NCC then determines the product type of the SMS originator. The named event and product type are linked together in the named event catalogue, and the rating parameters defined in the named event catalogue for the named event are used. These will overwrite the rating settings which have been configured for the named event by default. If nothing has been defined for the named event in the named event catalogue, then the default rating parameters for the named event will be used.

The rating parameters include:

- Cash cost
- Time cost
- Unit cost
- Time periods - this allows you to configure a rate that can differ depending on a time band.

Additionally, a balance cascade must be defined for each named event. This is a list of balances that define the balances to use to pay for the service, and the order in which the balances should be used.

A discount can be given to the rate, based on a discount node in the control plan being used. SNST determines via the control plan, if the SMS recipient belongs to one of the friends in the SMS recipient friend lists. If this is the case, then the control plan logic applies a discount through the discount node.
For more information on how to configure rating, see CCS User’s Guide.

**No SNST/No Phone Friends**

If the SMS Originator has no ‘Registered’ SNST status, or the SMS Recipient is not found in the SMS Originators Phone Friend Lists, then the SNST performs the following actions:

- Bill the SMS on the VWS.
- Forward the SMS unchanged to a globally configurable GTA, representing the SMSc or SMSc pool. The SCCP Originating Address will be the GTA of the SLC handing the SMS.
- Forward the response from the SMSc to the (V)MSC.

**Phone Friend tariff**

If the SMS Recipient is found in the Phone Friend Lists of the SMS Originator, then SNST performs the following actions:

- Apply a discount and bill the SMS on the VWS.
- Forward the SMS unchanged to a globally configurable GTA, representing the SMSc or SMSc pool. The SCCP Originating Address will be the GTA of the SLC handling the SMS.
- Forward the response from the SMSc to the (V)MSC.
Overview

Introduction

This chapter explains Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) Service Bundles.

In this chapter

This chapter contains the following topics.

Service Bundles

Service Bundles

About service bundles

Service Bundles enable a subscriber to purchase credit to be used exclusively for Phone Friend Link traffic (Calls and SMS messages) during a fixed validity period. For example, a subscriber could purchase a bundle of 1000 SMS messages to use for Phone Friend links within the next month for only 10 EUR.

Friend link balances

This table lists the predefined SNST friend link balances that are used to hold service bundle credits.

<table>
<thead>
<tr>
<th>Balance</th>
<th>Expressed in</th>
<th>Charged from this balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST On-net Time</td>
<td>Seconds</td>
<td>Regular voice calls to On-net Phone Friends.</td>
</tr>
<tr>
<td>SNST Off-net Time</td>
<td>Seconds</td>
<td>Regular voice calls to Off-net Phone Friends.</td>
</tr>
<tr>
<td>SNST On-net SMS</td>
<td>Units</td>
<td>Regular SMS messages to On-net Phone Friends.</td>
</tr>
<tr>
<td>SNST Off-net SMS</td>
<td>Units</td>
<td>Regular SMS messages to Off-net Phone Friends.</td>
</tr>
</tbody>
</table>

Service bundle configuration

You can configure up to seven different service bundles for SNST. You configure service bundles through the following parameters:

- The name of the bundle
- The credit value of the bundle

The credit value of the bundle can consist of a maximum four balance credits. You should specify the following parameters for each balance credit:

- Balance Type
- Recharge Value (expressed in cash, time, or units, depending on the balance type)
- Validity (expressed in days)
• Extension Policy, which can be either:
   Replace: Any remaining credit in this balance is replaced. Expiry date is calculated as an off-set
    of the current date
   Extend: New credit is added to any remaining credit in this balance. Expiry date is calculated as
    best between existing expiry date and an off-set of the current date.

Example service bundles
Here is an example of the configuration defined for four example Service Bundles.

<table>
<thead>
<tr>
<th>SB Name</th>
<th>Description</th>
<th>SNST Time</th>
<th>Validity</th>
<th>SNST SMS</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle1</td>
<td>Phone Friend Talk &amp; Messaging</td>
<td>250 min any phone friend</td>
<td>60 days</td>
<td>250 any phone friend SMS</td>
<td>60 days</td>
</tr>
<tr>
<td>Bundle2</td>
<td>Phone Friend Talk</td>
<td>250 min any phone friend</td>
<td>60 days</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bundle3</td>
<td>Phone Friend SMS</td>
<td>0</td>
<td>0</td>
<td>250 any phone friend SMS</td>
<td>60 days</td>
</tr>
<tr>
<td>Bundle4</td>
<td>Unlimited NCC-Tel Phone Friend Talk &amp; SMS for 1 month</td>
<td>10000 On-Net SFR or RFR Phone Friend links</td>
<td>30 days</td>
<td>10000 On-Net SFR or RFR Phone Friend links</td>
<td>30 days</td>
</tr>
</tbody>
</table>

Service bundle voucher types
The SNST includes seven predefined voucher type definitions. The definitions are used in the service
bundle logic, and named SNST Bundle 1 through SNST Bundle 7. Subscribers can purchase the
voucher types using SMS, PI or IVR.

You configure which voucher type to use for each service bundle in the service bundle profile fields in
the Edit Product Type screen in the NCC UI. For more information, see SNST Product Type
Configuration (on page 92).

If required, you can create new voucher types that can be used for service bundles instead of the SNST
predefined voucher types. For example, you could create a new voucher type called “Super Promo”,
and assign this to the “SNST Bundle 1” in the SNST Product Type. A subscriber can purchase this by
sending BUNDLE Super Promo.

For more information on configuring voucher types, see CCS User’s Guide.

The ‘Purchase Service Bundle’ control plans (with the bundle purchase logic) load the voucher type
names for the seven Voucher Types defined in the product type profile fields (Bundle 1 to Bundle 7) and
match the subscriber text with these.

Purchasing service bundles
Only registered subscribers may purchase service bundles. Subscribers purchase service bundles
using the following methods:

• SMS
• IVR
• PI/XML/SOAP
• SNST UI

Purchase service bundle by SMS
A subscriber can purchase a service bundle by sending an SMS in the following format to the SNST:

• BUNDLE keyword service_bundle_name sent to short_code

Where
service_bundle_name is the name of the service bundle the subscriber is purchasing.
short_code is the operator defined short code for the SNST service.

Example:

BUNDLE Phone Friend SMS Pack1 -> 777

The keyword can be configured in keyword sections. See Configuring keywords (on page 22).

Purchase service bundle by IVR

When integrated with an external IVR, the SNST provides the ability to purchase service bundles within the IVR self care menu.

A subscriber can purchase a service bundle by calling the SNST IVR short number and select the required service bundle in the IVR menus.

Purchase service bundle by PI/XML/SOAP

A service bundle can be credited to a SNST subscriber by sending an XML or SOAP request to the SNST.

The XML/SOAP request has the following mandatory parameters:

- The MSISDN of the subscriber receiving the service bundle
- The name of the service bundle

The SNST will return a result code in response to the XML/SOAP purchase request to indicate successful application of the service bundle. For more information on the XML/SOAP request, see Web Portal (on page 61).

Purchase service bundle by UI

A service bundle can be credited to an SNST subscriber, and immediately verified as successful, through the SNST UI.

EDRs

For calls and SMS messages charged from service bundles on the SNST, the SNST produces an EDR which can be used for mediation and correlation.

An SMS notification is also sent to the subscriber. This table shows some example SMS notifications.

<table>
<thead>
<tr>
<th>Template Name</th>
<th>Default text</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST Notif Bundle Fail (No Name)</td>
<td>You have not specified a valid bundle name.</td>
</tr>
<tr>
<td>SNST Notif Bundle Fail (Recharge)</td>
<td>There was an error recharging your bundle.</td>
</tr>
<tr>
<td>SNST Notif Bundle Suc</td>
<td>Thank you. You have successfully been recharged &lt;&lt;1&gt;&gt;</td>
</tr>
</tbody>
</table>

Voice services

If the subscriber has a service bundle with a valid time based balance and if the subscriber calls a phone friend, then the call will be charged on the SNST from this time based balance.

A single rate will be available where the call is charged based on the duration in seconds from the time based balance.

Example

- Subscriber Balance before call = 250s
- Phone Friend Call duration = 120s
- Subscriber Balance after call = 130s
All calls to On-net phone friends can be charged from a dedicated ‘SNST On-net Time’ balance. All calls to Off-net phone friends can be charged from a dedicated ‘SNST Off-net Time’ balance. Service bundles can be defined which will credit the subscriber with only On-net Time, only Off-net Time, or a combination of both.

**SMS services**

If the subscriber has a service bundle with a valid SMS based balance available and sends an SMS to a phone friend, the SMS will be charged on the SNST from this SMS based balance.

A single rate will be available where the SMS is charged as one unit from an SMS based balance.

**Example**

Subscriber Balance before SMS = 10 units

Subscriber Balance after SMS = 9 units

All SMS messages to On-net phone friends can be charged from a dedicated ‘SNST On-net SMS’ balance while all SMS messages to Off-net phone friends can be charged from a dedicated ‘SNST Off-net SMS’ balance. Service bundles can be defined which credit the subscriber with only On-net SMS, only Off-net SMS, or a combination of both.
Chapter 6

Acquisition Schemes

Overview

Introduction

Subscribers to the Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) can invite off-net subscribers to join the operator. If the targeted subscriber churns, both the referred and referring subscriber can be granted a referral reward in the form of a free of charge Service Bundle.

This chapter explains the SNST acquisition schemes.

In this chapter

This chapter contains the following topics.

- Invitation to Join the Network
- Best Phone Friend Referral Atom
- Empathy Atom Joining Reward

Invitation to Join the Network

About joining the network

When an off-net Phone Friend is added, the SNST notifies the subscriber that they have added an off-net user through a configurable notification SMS. The notification SMS can be configured to include a proposal to invite the new Phone Friend to the network.

Invitation proposal

The 'off-net Phone Friend add' notification SMS is configured to include a proposal to invite the off-net Phone Friend into the network. The notification SMS must include the following items:

- MSISDN of the off-net Phone Friend
- SNST shortcode

Example: Here is an example of the notification 'SNST Notif Add A Suc (Offnet)'.

Thanks 012345678 from operator 122 has been added to your friend network and friend discounts now apply. Refer your friend to OperatorTel by forwarding this SMS to 777 or use the OperatorTel app on SNS. There is a reward of 20 friend minutes for every succesful referral.

Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.

Invitation request

On reception of an invitation request (as a forward SMS) the SNST will:

- Verify that the requesting subscriber is in On-net Registered state, the target subscriber is really off-net, and in the requesting subscribers Added list.
• Record the invitation request details in the Subscriber Profile of both subscribers in a list named ‘SNST Invited Referral List’.

• Send a configurable invitation SMS to the target off-net subscriber. The originating number of this SMS is set to the requesting subscriber's MSISDN.

  Example: Here is an example of the notification ‘SNST Notif Invite B Suc’.
  Hi, 0987654321 here. I use the OperatorTel network and when I call my friends I receive very competitive rates. Why don't you join? OperatorTel will give us both a reward of 10 Euro. To nominate me as a referrer, forward this SMS or send NOMINATE + 0987654321 to 777 or use the OperatorTel app on SNS for full details.

• Send a configurable confirmation SMS to the requesting subscriber.

  Example: Here is an example of the notification ‘SNST Notif Invite A Suc’.
  You have referred your friend to join OperatorTel. If they join based upon your referral you will receive a reward!

Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.

Best Phone Friend Referral Atom

About best phone friend referral

When Best Phone Friends call or text each other, they get a bigger discount than when calling or texting other Phone Friends. The SNST can allow a referred off-net subscriber (a subscriber that has been invited by an on-net subscriber to join the on-net subscriber's network) to nominate one of his referrer on-net Friends as 'Best Phone Friend'.

Eligibility

Only subscribers who have been referred (have received an INVITE,) and are off-net, are eligible to nominate a Best Friend.

Only on-net registered subscribers who have invited an off-net subscriber are eligible to be nominated as Best Friend.

Nomination by forwarding the invitation

If the off-net subscriber has been invited by an on-net subscriber, he can forward the received SMS to an operator defined short code for the SNST. The notification must include the following items:

• MSISDN of the on-net Phone Friend
• SNST shortcode

  Example: Here is an example of the notification ‘SNST Notif Invite B Suc’.
  Hi, 0987654321 here. I use the OperatorTel network and when I call my friends I receive very competitive rates. Why don't you join? OperatorTel will give us both a reward of 10 Euro. To nominate me as a referrer, forward this SMS or send NOMINATE + 0987654321 to 777 or use the OperatorTel app on SNS for full details.

  Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.

Nominate request

A subscriber can nominate a best Phone Friend once, by sending an SMS to the SNST in the following format:

• NOMINATE MSISDN sent to short_code

Where
• MSISDN is the MSISDN of nominated best friend
• short_code is the operator defined short code for the SNST.

Example:
NOMINATE 32497972861 -> 777

Nominate request verification

On receiving a nomination request SMS, the SNST checks the following conditions are met:

- The requesting subscriber is an off-net SNST subscriber.
- The requested best Phone Friend MSISDN is on the Referrer list of the requesting subscriber.
- The requested best Phone Friend MSISDN is on-net.

If these conditions are not met, a configurable notification SMS will be sent to the requesting subscriber.

Nominate request actions

On receiving a valid nomination request SMS, the SNST will perform the following actions:

- Subscribe the off-net subscriber to an Off-net Periodic Charge, named ‘SNST Off-Net Subscription’. This is a notification only periodic charge, that triggers monthly and notifies the off-net subscriber that they have been referred or invited.
  
  Example: Here is an example of the notification ‘SNST Notif Lifecycle Off-Net Suc’:

  Hi, you have been referred to join OperatorTel and are eligible for a special reward. Simply follow the instructions using the OperatorTel app on SNS for full details.

- If there is already an entry in the ‘Best Phone Friend’ list of the requesting subscriber, this entry will be deleted from the ‘Best Phone Friend’ list of both the requesting, and the target subscriber.
- Add the target MSISDN to the ‘Best Phone Friend’ list of the requesting subscriber.
- Add the MSISDN of the requesting subscriber to the ‘Best Phone Friend’ list of the target subscriber.
- Send a configurable notification SMS to both subscribers.

  To the requesting off-net subscriber:

  Example: Here is an example of the notification ‘SNST Notif Nominate Suc (A)’.

  You have nominated 0987654321!

  To the requested on-net subscriber:

  Example: Here is an example of the notification ‘SNST Notif Nominate Suc (B)’.

  012345678 has nominated you as a referrer. Make sure they port their number to OperatorTel so that you receive your referral reward.

Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User’s Guide.

Porting-in

When an off-net subscriber ports in, the SNST will perform the following actions simultaneously:

- Credit the subscriber’s porting in SNST account with a single configurable Service Bundle (SNST Referral Reward in the SNST Referral Scheme of the SNST Product Type), and send a configurable notification SMS to the ported in subscriber.

  Example: Here is an example of the notification ‘SNST Notif Referred Reward’.

  Welcome to OperatorTel. You have received a welcome gift of 10 Euro and so has 0987654321 for referring you.

- Credit the subscriber who had been nominated by the off-net subscriber with a single configurable Service Bundle (SNST Referrer Reward in the SNST Referral Scheme of the SNST product type), and send a configurable notification SMS to the nominated subscriber.
Example: Here is an example of the notification ‘SNST Notif Referring Reward’.
Your friend 0123456789 just joined OperatorTel thanks to your referral. Please accept a referral reward of 20 minutes.

Empathy Atom Joining Reward

About empathy joining reward

If a subscriber is porting in, but did not nominate any referring subscribers (that is, they do not have a Best Friend), this subscriber is still eligible for a joining reward.

Empathy joining reward

When porting in, if the joining subscriber is in Registered SNST state and is not eligible (no Best Friend) for a referral reward, a single configurable Service Bundle will be credited to the subscriber's SNST account.

A configurable notification SMS will be sent to the subscriber.

Example: Here is an example of the notification ‘SNST Notif Empathy Atom Reward’.
Welcome to NCC. You have received a welcome gift of 250 Phone Friend Minutes.

Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.
Overview

Introduction

This chapter explains the Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) retention schemes.

In this chapter

This chapter contains the following topics.

Influential Atom Rewards

Pressured Atom Rewards

High Risk Atom Rewards

Influential Atom Rewards

About influential atom rewards

The SNST can be configured to automatically reward popular (influential) subscribers. A subscriber's popularity is measured by the number of entries in their Received Phone Friend List (how many Phone Friend requests they have received).

After reaching a threshold, the subscriber will automatically receive a reward, on a periodic basis, of a small Service Bundle. For example, they may receive a reward every month of 100 Phone Friend SMS messages, valid for 1 month.

The more entries in their Received Phone Friend List, the larger the Service Bundle reward.

Influential rewards

You can configure rewards in SNST to allow Registered SNST subscribers to automatically receive periodic rewards based on the size of their Received Phone Friend List.

You can configure rewards to:

- Set the periodicity of the reward to weekly, monthly, quarterly or yearly and to a fixed day (such as the first day of the month) in the configured period.
- Set four reward levels, where each reward level consists of the required number of Received Entries to reach this level, and the awarded Service Bundle.

You configure reward levels in the SNST Retention Schemes profile on the Edit Product Type screen. For more information, see SNST Product Type Configuration (on page 92).

Example:

<table>
<thead>
<tr>
<th>Number of Received Entries (threshold)</th>
<th>Periodically awarded Service Bundle</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 8</td>
<td>Influential Atom Reward Bundle 1</td>
</tr>
<tr>
<td>9 to 13</td>
<td>Influential Atom Reward Bundle 2</td>
</tr>
</tbody>
</table>
Received entries threshold and bundle rewards

When reaching one of the configured Received threshold levels, the SNST subscriber automatically receives the corresponding configured Service Bundle at the end of the current period.

Each time a Received threshold is crossed, a configurable notification SMS is sent to the subscriber.

Example: Here is an example of the notification ‘SNST Notif InfAtom Sub Suc’.

Congratulations, you have now received 15 friend requests. As a reward you will receive 100 free Friend SMS every month.

Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.

Awarding bundle reward

At the end of the configured period the SNST automatically credits the currently corresponding Service Bundle to the subscriber. A configurable notification SMS is automatically sent to the subscriber.

Example: Here is an example of the notification ‘SNST InfAtomRew 2’.

You have received 50 free friend SMSs, valid for 1 month.

Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.

Pressured Atom Rewards

About pressured atom rewards

You can configure SNST to automatically reward pressured subscribers. Subscribers are considered pressured (to port out) when they have many off-net Phone Friends, for example, when they have many entries on their Off-net Added list.

Pressure rewards

You can configure SNST to allow Registered SNST subscribers to automatically receive periodic rewards based on the size of their Off-net Added Phone Friend List.

You configure the rewards in the SNST Retention Schemes profile on the Edit Profile screen. You can set the periodicity of the rewards to weekly, monthly, quarterly or yearly and set a fixed day (for example, first day of the month) for the reward.

Off-net threshold and bundle rewards

When reaching the configured threshold level, the SNST subscriber automatically receives the corresponding configured Service Bundle at the end of the current period.

When the number of entries in the subscriber's Off-net Added Phone Friends list goes above the configured threshold, a configurable SMS notifications is sent.

Example: Here is an example of the notification ‘SNST Notif PresAtom Sub Suc’.

As a valuable customer NCC-Tel will provide you with a monthly reward. You will receive 10 free Phone Friend SMS every month.
**Awarding bundle reward**

At the end of the configured period the SNST automatically credits the currently corresponding Service Bundle to the subscriber. A configurable notification SMS is automatically sent to the subscriber.

**Example:** Here is an example of the notification 'SNST Notif PresAtomRew 1'.

You have received 50 free friend SMSs, valid for 1 month.

**Note:** Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.

**High Risk Atom Rewards**

**About high risk rewards**

When a SNST registered subscriber churns (ports out), the risk of churning for his Phone Friends increases. A Service Bundle reward can automatically be applied to these Phone Friends to discourage churning.

**High Risk reward**

You can globally enable the Risk Reward feature in SNST. When Risk Reward is configured, the Port Out logic automatically credits a single configurable Service Bundle to all registered on-net Phone Friends (all Phone Friend lists) of the subscriber being ported out.

A configurable notification SMS is sent to each Phone Friend.

**Example:** Here is an example of the notification 'SNST Notif Risk Reward'.

You are a valued customer - you have received 50 free Friend SMSs.

**Note:** Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.
Overview

Introduction

This chapter explains the Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) Click 2 Call and Click 2 SMS services.

In this chapter

This chapter contains the following topics.
Click 2 Call 57
Click 2 SMS 58

Click 2 Call

About Click 2 Call

Click2Call (C2C) is an ISUP Callback service which provides the ability to set up and charge for a friend-to-friend call initiated through an Open Services Development (OSD) SOAP command.

Click 2 Call request

The OSD SOAP request for the C2C service includes a parameter with the MSISDN of the subscriber initiating the request (this is the subscriber who will be charged for the call) and a parameter for the destination subscriber.

Subscriber validation

The initiating subscriber must be a Registered, On-net SNST Subscriber. The destination subscriber must be an SNST Phone Friend of the initiating subscriber.

The request will fail if these conditions are not met and an error code will be returned.

Call setup

SNST initiates a call to the initiating subscriber using ISUP IAM (A leg).

On receiving an answer from the initiating subscriber, SNST initiates the B leg of the call to destination subscriber, and connects the call. This will appear to the destination subscriber as a standard inbound call originating from the initiating subscriber.
Click 2 SMS

About Click 2 SMS

Click 2 SMS (C2S) is a service that provides the ability to deliver, submit, and charge for friend-to-friend SMS messages. Click2SMS is initiated by OSD SOAP request to the SNST, for example, the OSD SOAP request can be issued by a Web Portal.

Click 2 SMS request

The Click 2 SMS service is initiated through an OSD SOAP operation sent to the SNST. This operation includes the following parameters:

- A parameter with the MSISDN of the subscriber initiating the request (this is the subscriber who will be charged for the SMS).
- A parameter for the MSISDN of the recipient subscriber.
- A parameter for the message to be sent.

Initiating subscriber validation

The initiating subscriber must be a Registered, On-net SNST Subscriber. The request will fail if this condition is not met and an OSD SOAP error will be returned.

SMS handling for Click 2 SMS

The Click 2 SMS service supports the same SMS submission and delivery options as for standard SNST Notification SMS messages.

Charging

The SMS will be charged in the standard way. For more information, see SMS (on page 42).
Overview

Introduction

This chapter explains how you can use IVR to access the Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) Self Care feature.

In this chapter

This chapter contains the following topics.

SNST Self Care and IVR

SNST Self Care and IVR

About IVR

In a GSM network, you can access the Self Care feature of SNST through a CS1 compatible IVR which can be integrated with SNST.

A list of all announcement semantics and identifiers that are used in the PA/PACUI operations generated by SNST is provided by SNST configuration. The operator is responsible for the recording and configuration of the required announcements in all supported languages on the IVR that shall be integrated with SNST.

SNST supports multiple languages on the IVR through the use of a language extension in the PA/PACUI operations generated by SNST. The IVR that you integrate with SNST must support this extension in order to support multiple IVR languages.

When a subscriber, who has not yet configured the preferred language, calls the self care number, the system will automatically connect the caller to an IVR menu to select the preferred language.

A subscriber accesses the IVR Self Care by calling a special number (short code), configurable by the operator.

In order to avoid call forwarding by the network the SNST service releases all incoming calls that have been forwarded.

Self care main menu

The self care main menu provides a single entry point for the IVR Self Care. The menu provides an overview of the available Self Care features and allows navigation to the sub-menus for the individual self care features.

Preferred language

A subscriber can change the preferred language through IVR Self Care.
Self care help

A subscriber can listen to help text explaining how to use and benefit from the service provided by SNST Self Care.

Phone friend count

A subscriber can listen to the following Phone Friend information:

- Number of Phone Friend links allowed
- Current number of Phone Friends. The following counts will be played:
  - Number of Added Phone Friends (total)
  - Number of Received Phone Friends
  - Total number of Phone Friends

Phone friend list

A subscriber can listen to a list of all Phone Friends. The MSISDN will be played for each Phone Friend. Lists will be played in this order:

- Added On-net Phone Friends
- Added Off-net Phone Friends
- Received Phone Friends

Service bundles

A subscriber can use IVR Self Care to find out about Service Bundles. Using IVR Self Care, subscribers can:

- Listen to a list of available Service Bundles.
- Listen to the remaining credit on currently purchased Service Bundle.
- Purchase additional Service Bundles.

Announcements

The announcements used by the IVR are set up on the Announcements tab of the ACS Configuration screen. For more information, see ACS User's Guide.
Overview

Introduction

This chapter explains the Simple Object Access Protocol (SOAP) operations that the Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) uses when exchanging messages with the web portal.

In this chapter

This chapter contains the following topics.

About the Web Portal 61
WSDL 62
snstAddFriends 63
snstBlock 65
snstBundle 66
snstClick2Call 68
snstClick2SMS 69
snstInvite 71
snstNominate 72
snstQueryFriendList 74
snstQueryFriendListSize 75
snstRegister 77
snstRemoveFriend 78
snstStatus 79
WSDL Message Parameters 81
SNST Verification SMS 85

About the Web Portal

Introduction to web portal

Simple Object Access Protocol (SOAP) is a protocol specification for exchanging messages between web services on computer networks and on the internet. The SNST uses this protocol to exchange messages with the web portal or Social Networking application of the ASP.

Web Services Description Language (WSDL) is an XML based language that provides a model for describing those web services. To develop the social networking application, you must provide the WSDL file for the required web services to the application service provider or widget developer.

The SOAP operations should be addressed to the Open Services Development (OSD) interface running on the SLC.

Note: OSD, through the OSD interface, provides a mechanism to dynamically bind incoming or outgoing SOAP requests to, or from, profile fields in a running control plan.

This section explains the available SOAP operation requests for SNST, and the corresponding result and error codes.
WSDL

About WSDL

The WSDL file is generated from a combination of control plans and the OSD configuration. When you compile the control plan in NCC, you can link it to an operation name. This results in a WSDL file being created on the SMS for the operation. This file contains the WSDL operation details, including:

- Operation request
- Operation response
- Operation fault XML messages

The WSDL operation details are based on the contents of profile fields from inbound and outbound extensions profile blocks in the control plan.

For more information, see *OSD User's & Technical Guide*.

Location of WSDL files

When you install SNST, the following WSDL file is created for SNST WSDL operations:

**SNST.wsdl** - This file contains the description of all the SNST operations and bindings.

The file is located on the SMS in the following directory:

- `/IN/html/wsdls/service_provider/SNST.wsdl`

Where `service_provider` is the ACS Customer that was selected during the SNST installation. The ACS Customer is set to "OCNCCtemplate" by default.

WSDL operations list

This table lists and describes the WSDL operations developed for SNST. These operations will be explained in more detail in the following sections.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>snstAddFriends</td>
<td>Add one or more Phone Friends to the subscriber’s Phone Friend list.</td>
</tr>
<tr>
<td>snstBlock</td>
<td>Allow a subscriber to block their SNST registration.</td>
</tr>
<tr>
<td>snstBundle</td>
<td>Purchase a service bundle.</td>
</tr>
<tr>
<td>snstClick2Call</td>
<td>Initiates the click2call service.</td>
</tr>
<tr>
<td>snstClick2SMS</td>
<td>Initiates the click2SMS service.</td>
</tr>
<tr>
<td>snstInvite</td>
<td>Initiates referral invitation logic from an On-net Registered SNST subscriber to a chosen friend MSISDN. The MSISDN must be on the initiating subscribers Off-net Added list.</td>
</tr>
<tr>
<td>snstNominate</td>
<td>Nominate an On-net Registered SNST subscriber as a Best Phone Friend. The nomination can only be done from an Off-net SNST subscriber. Once the Off-net subscriber ports in, both subscribers become Best Friends, and they get a special Best Friends discount when calling or sending each other SMS messages.</td>
</tr>
<tr>
<td>snstQueryFriendList</td>
<td>Retrieve a subscriber’s list of Phone Friends.</td>
</tr>
<tr>
<td>snstQueryFriendListSize</td>
<td>Retrieve the subscriber’s Phone Friend list size.</td>
</tr>
<tr>
<td>snstRegister</td>
<td>Allow a subscriber to request SNST service registration.</td>
</tr>
</tbody>
</table>
### Operation

<table>
<thead>
<tr>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>snstRemoveFriend</td>
<td>Allow a single Phone Friend to be removed from the subscriber’s Phone Friend list.</td>
</tr>
<tr>
<td>snstStatus</td>
<td>Retrieve the subscriber’s SNST status.</td>
</tr>
</tbody>
</table>

### WSDL operation fault messages

WSDL operation fault messages contain the standard SOAP release causes for OSD when a system failure occurs. They are used in the error code parameter of SOAP faults sent to ASPs. The following example fault message shows the common structure that is used in all SNST WSDL operation fault messages.

**Note:** See *OSD User’s & Technical Guide* for more information on possible error codes.

### Example fault message

Here is an example WSDL operation fault message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
  <SOAP-ENV:Body>
    <SOAP-ENV:Fault>
      <faultcode>SOAP-ENV:Server</faultcode>
      <faultstring>snst_wsdl_operation error: System Error</faultstring>
      <detail>
        <m:snstAddFriendsFault
        </m:snst_wsdl_operation_fault>
      </detail>
    </SOAP-ENV:Fault>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Where:

- `snst_wsdl_operation` is an SNST operation from the *WSDL operations list* (on page 62), for example, `snstAddFriends`.
- `snst_wsdl_operation_fault` is the corresponding fault message, for example, `snstAddFriendFault`.

### snstAddFriends

#### About snstAddFriends

This WSDL operation will add one or more Phone Friends to the subscriber’s Phone Friend list. The operation comprises the following messages:

- `snstAddFriendsRequest`
- `snstAddFriendsResult`
- `snstAddFriendsFault`

For more information on fault messages such as `snstAddFriendsFault`, see *WSDL operation fault messages* (on page 63).
snstAddFriendRequest

To add one or more Phone Friends you send the snstAddFriendsRequest message to the SNST. The following parameters are used by snstAddFriendsRequest:

- **CC_Calling_Party_Id** (on page 81)
- **SNST_Friend_List** (on page 82)

Example snstAddFriendRequest

Here is an example SNST SOAP snstAddFriendsRequest message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope xmlns:SOAPENC="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <SOAP-ENV:Header/>
  <SOAP-ENV:Body xmlns:ns1="http://10.38.244.142/wsdls/OCNCTemplate/SNST.wsdl">
    <ns1:snstAddFriendsRequest
      xmlns:ns1="http://10.38.244.142/wsdls/OCNCTemplate/SNST.wsdl">
      <CC_Calling_Party_Id>32495000330</CC_Calling_Party_Id>
      <SNST_Friend_List>
        <number>32495500330</number>
      </SNST_Friend_List>
    </ns1:snstAddFriendsRequest
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

snstAddFriendResult

SNST returns the results of a snstAddFriendsRequest operation in a snstAddFriendResult message. The following return parameters are used by snstAddFriendResult:

- **SNST_Result** (on page 84)
- **SNST_Error** (on page 81)

snstAddFriendResult error list

This table lists the possible errors returned in the snstAddFriendResult message.

<table>
<thead>
<tr>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invalid/Unallowed Friend</td>
<td>The requested number to be added in the Added List is not in a valid number format.</td>
</tr>
<tr>
<td>Already Friend</td>
<td>The request number to be added in the Friend List already exists in one of the Added lists.</td>
</tr>
<tr>
<td>Added List Full Failure</td>
<td>The Added list exceeds the maximum number of entries possible.</td>
</tr>
<tr>
<td>Provisioning Error</td>
<td>The friend to be added does not exist yet on the SNST platform, because the system was unable to create the new subscriber.</td>
</tr>
<tr>
<td>Not Registered</td>
<td>The operation is not allowed if the requesting subscriber is not in a Registered state.</td>
</tr>
<tr>
<td>Daily Friend Change Limit Exceeded</td>
<td>The maximum number of Friend Changes (max. 10) within 24 hours has been exceeded.</td>
</tr>
<tr>
<td>Received List Full</td>
<td>The requesting SNST subscriber can not be added in the Received list of the requested friend because the limit size of this list has been exceeded.</td>
</tr>
<tr>
<td>Error</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Internal Failure</td>
<td>An internal application error occurred.</td>
</tr>
</tbody>
</table>

Example snstAddFriendResult

Here is an example SNST SOAP snstAddFriendsResult message:

Date: Mon, 18 Jul 2011 09:56:33 GMT  
Server: Oracle OSD  
Content-Length: 447  
Content-Type: text/xml  
Connection: close

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
 <SOAP-ENV:Body>
 <m:snstAddFriendsResult
 xmlns:m="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
 <SNST_Result>OK</SNST_Result>
 </m:snstAddFriendsResult>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

snstBlock

About snstBlock

Use the snstBlock WSDL operation to set the status of a SNST subscriber to "Deactivated". The operation comprises the following messages:

- snstBlockRequest
- snstBlockResult
- snstBlockFault

For more information on fault messages such as snstBlockFault, see *WSDL operation fault messages* (on page 63).

snstBlockRequest

To block the SNST service you send the snstBlockRequest to the SNST. snstBlockRequest has the following parameter:

- **CC_Calling_Party_Id** (on page 81)

Example snstBlockRequest

Here is an example SNST SOAP snstBlockRequest message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
 xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/encoding/
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <SOAP-ENV:Header/>
```
<soap-env:Envelope xmlns:soap-ns1="http://10.38.244.142/wsdls/OCNCtemplate/SNST.wsdl">
  <ns1:snstBlockRequest
    xmlns:ns1="http://10.38.244.142/wsdls/OCNCtemplate/SNST.wsdl">
    <CC_Calling_Party_Id>32495000331</CC_Calling_Party_Id>
  </ns1:snstBlockRequest>
</soap-env:Envelope>

snstBlockResult

SNST returns the results of a snstBlockRequest operation in a snstBlockResult message. snstBlockResult has the following return parameters:

- **SNST_Result** (on page 84)
- **SNST_Error** (on page 81)

snstBlockResult error list

This table lists the possible errors returned in the SNST_Error parameter in the snstBlockResult message.

<table>
<thead>
<tr>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Already Deactivated</td>
<td>The SNST subscriber is already in a Deactivated state.</td>
</tr>
<tr>
<td>Internal Failure</td>
<td>An internal application error occurred.</td>
</tr>
</tbody>
</table>

Example snstBlockResult

Here is an example SNST SOAP snstBlockResult message:

```xml
Date: Mon, 18 Jul 2011 13:00:43 GMT
Server: Oracle OSD
Content-Length: 437
Content-Type: text/xml
Connection: close

<?xml version="1.0"?>
<soap-env:Envelope
  xmlns:soap-ns1="http://schemas.xmlsoap.org/soap/envelope/
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
  <soap-env:Body>
    <ns1:snstBlockResult
      xmlns:ns1="http://10.38.244.142/wsdls/OCNCtemplate/SNST.wsdl">
      <SNST_Result>OK</SNST_Result>
    </ns1:snstBlockResult>
  </soap-env:Body>
</soap-env:Envelope>
```

snstBundle

About snstBundle

Use the snstBundle WSDL operation to purchase a service bundle for the SNST subscriber. The snstBundle operation comprises the following messages:

- snstBundleRequest
- snstBundleResult
• snstBundleFault
For more information on fault messages such as snstBundleFault, see WSDL operation fault messages (on page 63).

snstBundleRequest

To purchase a service bundle you send the snstBundleRequest message to the SNST. The following parameters are used by snstBundleRequest:
• CC_Calling_Party_Id (on page 81)
• SNST_Bundle (on page 81)

Example snstBundleRequest

What follows is an example of a SNST SOAP snstBundleRequest message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope xmlns:SOAPENC="http://schemas.xmlsoap.org/soap/encoding/"
    xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <SOAP-ENV:Header/>
    <SOAP-ENV:Body xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
        <ns1:snstBundleRequest xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
            <CC_Calling_Party_Id>32495000330</CC_Calling_Party_Id>
            <SNST_Bundle>SNST Bundle 1</SNST_Bundle>
        </ns1:snstBundleRequest>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

snstBundleResult

SNST returns the results of a snstBundleRequest operation in a snstBundleResult message. snstBundleResult has the following return parameters:
• SNST_Result (on page 84)
• SNST_Error (on page 81)

snstBundleResult error list

This table lists the possible errors returned in the SNST_Error parameter in the snstBundleResult message.

<table>
<thead>
<tr>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Bundle</td>
<td>The SNST_Bundle parameter in the operation request is missing.</td>
</tr>
<tr>
<td>Error Recharging Bundle</td>
<td>A failure occurred when recharging the account on the SLC. The account might be terminated for example.</td>
</tr>
<tr>
<td>Not Registered</td>
<td>The snstBundle operation is not allowed if the SNST subscriber is not registered.</td>
</tr>
<tr>
<td>Not for Off-net</td>
<td>Only On-net SNST subscribers can purchase a service bundle.</td>
</tr>
<tr>
<td>Internal Failure</td>
<td>An internal application error occurred.</td>
</tr>
</tbody>
</table>
Example snstBundleResult

Here is an example SNST SOAP snstBundleResult message:

```xml
<?xml version="1.0"?>
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <SOAP-ENV:Header/>
 <SOAP-ENV:Body xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
  <ns1:snstBundleResult xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
   <SNST_Result>OK</SNST_Result>
  </ns1:snstBundleResult>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

snstClick2Call

About snstClick2Call

Use the snstClick2Call WSDL operation to initiate a call from the web portal. The snstClick2Call operation comprises the following messages:

- snstClick2CallRequest
- snstClick2CallResult
- snstClick2CallFault

For more information on fault messages such as snstClick2CallFault, see WSDL operation fault messages (on page 63).

snstClick2CallRequest

To initiate a call, you send the snstClick2CallRequest message to the SNST. The following parameters are used by snstClick2CallRequest messages:

- CC_Calling_Party_Id (on page 81)
- SNST_Friend (on page 82)

Example snstClick2CallRequest

Here is an example SNST SOAP snstClick2CallRequest message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope xmlns:SOAPENC="http://schemas.xmlsoap.org/soap/encoding/"
 xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <SOAP-ENV:Header/>
 <SOAP-ENV:Body xmlns:n1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
  <n1:snstClick2CallRequest xmlns:n1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
   <CC_Calling_Party_Id>32495000330</CC_Calling_Party_Id>
   <SNST_Friend>32495000331</SNST_Friend>
  </n1:snstClick2CallRequest>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```
Chapter 10

snstClick2CallResult

SNST returns the results of a snstClick2CallRequest operation in a snstClick2CallResult message. snstClick2CallResult has the following return parameters:

- **SNST_Result** (on page 84)
- **SNST_Error** (on page 81)

snstClick2CallResult error list

This table lists the possible errors returned in the SNST_Error parameter in the snstClick2CallResult message.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Answer</td>
<td>The calling SNST subscriber does not answer the call back initiated from the Click2Call service.</td>
</tr>
<tr>
<td>Subscriber Busy</td>
<td>The calling SNST subscriber is busy and does not answer the call back initiated from the Click2Call service.</td>
</tr>
<tr>
<td>Not Registered</td>
<td>The snstClick2Call operation is not allowed if the calling SNST subscriber is not registered.</td>
</tr>
<tr>
<td>Internal Failure</td>
<td>An internal application error occurred.</td>
</tr>
</tbody>
</table>

Example snstClick2CallResult

Here is an example SNST SOAP snstClick2CallResult message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
 xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
 <SOAP-ENV:Body>
  <m:snstClick2CallResult
   xmlns:m="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
   <SNST_Result>OK</SNST_Result>
  </m:snstClick2CallResult>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

snstClick2SMS

About snstClick2SMS

Use the snstClick2SMS WSDL operation to initiate a SMS from the web portal, to a friend. The snstClick2SMS operation comprises the following messages:

- snstClick2SMSRequest
- snstClick2SMSResult
- snstClick2SMSFault
For more information on fault messages such as snstClick2SMSFault, see *WSDL operation fault messages* (on page 63).

**snstClick2SMSRequest**

To send a SMS, you send the `snstClick2SMSRequest` message to the SNST using the following parameters:

- *CC_Calling_Party_Id* (on page 81)
- *SNST_Friend* (on page 82)
- *SNST_Message* (on page 84)

**Example snstClick2SMSRequest**

Here is an example SNST SOAP `snstClick2SMSRequest` message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope xmlns:SOAPENC="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <SOAP-ENV:Header/>
  <SOAP-ENV:Body xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
    <ns1:snstClick2SMSRequest xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
      <CC_Calling_Party_Id>32495000330</CC_Calling_Party_Id>
      <SNST_Friend>32495000331</SNST_Friend>
      <SNST_Message>Hello World !</SNST_Message>
    </ns1:snstClick2SMSRequest>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

**snstCLick2SMSResult**

SNST returns the results of a `snstClick2SMS` operation in a `snstClick2SMSResult` message using the following return parameters:

- *SNST_Result* (on page 84)
- *SNST_Error* (on page 81)

**snstClick2SMSResult error list**

This table lists the possible errors returned in the `SNST_Error` parameter in the `snstClick2SMSResult` message.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Delivery Failure</td>
<td>The message could not be delivered to the SNST Friend due to a telephony network error.</td>
</tr>
<tr>
<td>Not Registered</td>
<td>The <code>snstClick2SMS</code> operation is not allowed if the calling SNST subscriber is not registered.</td>
</tr>
<tr>
<td>Internal Failure</td>
<td>An internal application error occurred.</td>
</tr>
</tbody>
</table>

**Example snstClick2SMSResult**

Here is an example SNST SOAP `snstClick2SMSResult` message:

```xml
<?xml version="1.0"?>
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
SOAPENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
```

70  NCC Social Networking Service Template User's and Technical Guide
snstInvite

About snstInvite

The snstInvite WSDL operation sends an invitation from an On-net Registered SNST subscriber to join the On-net Registered SNST subscribers network, to a chosen Off-net friend MSISDN. The MSISDN must be on the initiating subscriber’s Off-net Added list. The snstInvite operation comprises the following messages:

- snstInviteRequest
- snstInviteResult
- snstInviteFault

For more information on fault messages such as snstInviteFault, see WSDL operation fault messages (on page 63).

snstInviteRequest

To invite the Off-net friend to join the On-net network, you send the snstInviteRequest message to the SNST using following parameters:

- CC_Calling_Party_Id (on page 81)
- SNST_Friend (on page 82)

Example snstInviteRequest

Here is an example SNST SOAP snstInviteRequest message:

```xml
<?xml version="1.0"?>
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xm xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
<SOAP-ENV:Header/>
<SOAP-ENV:Body xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
<ns1:snstInviteRequest xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
<CC_Calling_Party_Id>32495000330</CC_Calling_Party_Id>
<SNST_Friend>32495000331</SNST_Friend>
</ns1:snstInviteRequest>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

snstInviteResult

SNST returns the results of a snstInvite operation in a snstInviteResult message using the following return parameters:

- SNST_Result (on page 84)
- SNST_Error (on page 81)
snstInviteResult error list

This table lists the possible errors returned in the **SNST_Error** parameter in the **snstInviteResult** message.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Already Invited</td>
<td>The SNST subscriber has already invited the Off-net Friend.</td>
</tr>
<tr>
<td>Number Not Found On Friend List</td>
<td>The Off-net Friend is not in the SNST subscribers Added Off-net list.</td>
</tr>
<tr>
<td>Not Registered</td>
<td>The snstInvite operation is not allowed if the SNST subscriber is not registered.</td>
</tr>
<tr>
<td>Provisioning Error</td>
<td>An error occurred when updating the Referral lists.</td>
</tr>
<tr>
<td>Internal Failure</td>
<td>An internal application error occurred.</td>
</tr>
</tbody>
</table>

**Example snstInviteResult**

Here is an example SNST SOAP **snstInviteResult** message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
   xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
   xmlns:xsd="http://www.w3.org/2001/XMLSchema"
   SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
  <SOAP-ENV:Body>
    <m:snstInviteResult
      xmlns:m="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
      <SNST_Result>OK</SNST_Result>
    </m:snstInviteResult>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

**snstNominate**

**About snstNominate**

Use the **snstNominate** WSDL operation to nominate an On-net Registered SNST subscriber as a Best Phone Friend. The nomination can only be done from an Off-net SNST subscriber. Once the Off-net subscriber ports in, both subscribers become Best Friends and they get a special Best Friends discount when calling each other or sending each other SMS messages. The **snstNominate** operation comprises the following messages:

- **snstNominateRequest**
- **snstNominateResult**
- **snstNominateFault**

For more information on fault messages such as **snstNominateFault**, see *WSDL operation fault messages* (on page 63).

**snstNominateRequest**

To nominate an On-net friend as Best Friend, you send the **snstNominateRequest** message to the SNST using the following parameters:

- **CC_Callig_Party_Id** (on page 81)
- **SNST_Friend** (on page 82)
Example snstNominateRequest

Here is an example SNST SOAP snstNominateRequest message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope xmlns:SOAPENC="http://schemas.xmlsoap.org/soap/encoding/"
 xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <SOAP-ENV:Header/>
 <SOAP-ENV:Body xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
  <ns1:snstNominateRequest
   xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
   <CC_Calling_Party_Id>32495000330</CC_Calling_Party_Id>
   <SNST_Friend>32495000331</SNST_Friend>
  </ns1:snstNominateRequest>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

snstNominateResult

SNST returns the results of a snstNominate operation in a snstNominateResult message using the following return parameters:

- **SNST_Result** (on page 84)
- **SNST_Error** (on page 81)

snstNominateResult error list

This table lists the possible errors returned in the SNST_Error parameter in the snstNominateResult message.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only Off-net allowed to nominate friend</td>
<td>Only Off-net subscribers are allowed to nominate a best friend.</td>
</tr>
<tr>
<td>Only On-net Can Be Nominated</td>
<td>The Off-net subscriber can only nominate an On-net subscriber.</td>
</tr>
<tr>
<td>Not In Received Referral List</td>
<td>The Off-net subscriber initiating the nomination to an On-net subscriber has not been invited by that On-net subscriber previously.</td>
</tr>
<tr>
<td>Internal Failure</td>
<td>An internal application error occurred.</td>
</tr>
</tbody>
</table>

Example snstNominateResult

Here is an example SNST SOAP snstNominateResult message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope xmlns:SOAPENC="http://schemas.xmlsoap.org/soap/encoding/"
 xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <SOAP-ENV:Header/>
 <SOAP-ENV:Body xmlns:m="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
  <m:snstNominateResult
   xmlns:m="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
   <SNST_Result>OK</SNST_Result>
  </m:snstNominateResult>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```
snstQueryFriendList

About snstQueryFriendList

Use the snstQueryFriendList WSDL operation to retrieve the subscriber's list of Phone Friends. The snstQueryFriendList operation comprises the following messages:

- snstQueryFriendListRequest
- snstQueryFriendListResult
- snstQueryFriendListFault

For more information on fault messages such as snstQueryFriendListFault, see WSDL operation fault messages (on page 63).

snstQueryFriendListRequest

To query a subscriber's Phone Friend list, you send the snstQueryFriendListRequest message to the SNST using the following parameter:

- CC_Calling_Party_Id (on page 81)

Example snstQueryFriendListRequest

Here is an example SNST SOAP snstQueryFriendListRequest message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope xmlns:SOAPENC="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:SOAP=ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
<SOAP-ENV:Header/>
<SOAP-ENV:Body xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
<ns1:snstQueryFriendListRequest xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
<CC_Calling_Party_Id>32495000330</CC_Calling_Party_Id>
</ns1:snstQueryFriendListRequest>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

snstQueryFriendListResult

SNST returns the results of a snstQueryFriendList operation in a snstQueryFriendListResult message using the following return parameters:

- SNST_Friend_List_Added_On-net (on page 83)
- SNST_Friend_List_Added_Off-net (on page 82)
- SNST_Friend_List_Received (on page 83)
- SNST_Error (on page 81)

snstQueryFriendListResult error list

This table lists the possible errors returned in the SNST_Error parameter in the snstQueryFriendListResult message.

<table>
<thead>
<tr>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not a SNST registered subscriber</td>
<td>The snstQueryFriendList Operation is only allowed for registered SNST subscribers.</td>
</tr>
<tr>
<td>Error</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Unknown Status</td>
<td>The SNST service status of the subscriber can not be retrieved.</td>
</tr>
</tbody>
</table>

**Example snstQueryFriendListResult**

Here is an example SNST SOAP `snstQueryFriendListResult` message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
  <SOAP-ENV:Body>
    <m:snstQueryFriendListResult
      xmlns:m="http://10.38.244.142/wsdls/OCNCTemplate/SNST.wsdl">
      <SNST_Friend_List_Added_On-net>
        <number>32495500333</number>
        <number>32495500334</number>
      </SNST_Friend_List_Added_On-net>
      <SNST_Friend_List_Received>
        <number>32495500335</number>
        <number>32495500336</number>
      </SNST_Friend_List_Received>
    </m:snstQueryFriendListResult>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

**snstQueryFriendListSize**

**About snstQueryFriendListSize**

Use the `snstQueryFriendListSize` WSDL operation to retrieve the subscriber's list sizes. The `snstQueryFriendListSize` operation comprises the following messages:

- `snstQueryFriendListSizeRequest`
- `snstQueryFriendListSizeResult`
- `snstQueryFriendListSizeFault`

For more information on fault messages such as `snstQueryFriendListSizeFault`, see *WSDL operation fault messages* (on page 63).

**snstQueryFriendListSizeRequest**

To query the subscriber's friend list sizes, you send the `snstQueryFriendListSizeRequest` message to the SNST using the following parameter:

- `CC_Calling_Party_id` (on page 81)

**Example snstQueryFriendListSizeRequest**

Here is an example SNST SOAP `snstQueryFriendListSizeRequest` message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope xmlns:SOAPENC="http://schemas.xmlsoap.org/soap/encoding/"
  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
  <SOAP-ENV:Body>
    <m:snstQueryFriendListSizeRequest
      xmlns:m="http://10.38.244.142/wsdls/OCNCTemplate/SNST.wsdl">
      <CC_Calling_Party_id>12345</CC_Calling_Party_id>
    </m:snstQueryFriendListSizeRequest>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```
Chapter 10

xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <SOAP-ENV:Header/>
    <sn:snstQueryFriendListSizeRequest
      xmlns:sn="http://10.38.244.142/wsdl/OCNCCtemplate/SNST.wsdl">
      <CC_Calling_Party_Id>32495000330</CC_Calling_Party_Id>
    </sn:snstQueryFriendListSizeRequest>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>

snstQueryFriendListSizeResult

SNST returns the results of a snstQueryFriendListSize operation in a
snstQueryFriendListSizeResult message using the following return parameters:

- **SNST_Friend_List_Added_On-net_Size** (on page 83)
- **SNST_Friend_List_Added_Off-net_Size** (see "SNST_Friend_List_Added_Off-net" on page 83)
- **SNST_Friend_List_Received_Size** (see "SNST_Friend_List_Added_Off-net" on page 84)
- **SNST_Error** (on page 81)

snstQueryFriendListSizeResult error list

This table lists the possible errors returned in the **SNST_Error** parameter in the
snstQueryFriendListSizeResult message.

<table>
<thead>
<tr>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not a SNST registered subscriber</td>
<td>The snstQueryFriendListSize Operation is only allowed for registered SNST subscribers.</td>
</tr>
<tr>
<td>Unknown Status</td>
<td>The SNST service status of the subscriber can not be retrieved.</td>
</tr>
</tbody>
</table>

Example snstQueryFriendListSizeResult

Here is an example SNST SOAP snstQueryFriendListSizeResult message:

Date: Tue, 19 Jul 2011 14:33:45 GMT
Server: Oracle OSD
Content-Length: 670
Content-Type: text/xml
Connection: close

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
   xmlns:xsd="http://www.w3.org/2001/XMLSchema"
   SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
  <SOAP-ENV:Body>
    <m:snstQueryFriendListSizeResult
      xmlns:m="http://10.38.244.142/wsdl/OCNCCtemplate/SNST.wsdl">
      <SNST_Friend_List_Added_On-net_Size>2</SNST_Friend_List_Added_On-net_Size>
      <SNST_Friend_List_Added_Off-net_Size>0</SNST_Friend_List_Added_Off-net_Size>
      <SNST_Friend_List_Received_Size>2</SNST_Friend_List_Received_Size>
    </m:snstQueryFriendListSizeResult>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```
snstRegister

About snstRegister

Use the snstRegister WSDL operation to request the SNST service registration for a subscriber. The snstRegister operation comprises the following messages:

- snstRegisterRequest
- snstRegisterResult
- snstRegisterFault

For more information on fault messages such as snstRegisterFault, see WSDL operation fault messages (on page 63).

snstRegisterRequest

To register the SNST subscriber, you send the snstRegisterRequest message to the SNST using the following parameter:

- **CC_Calling_Party_Id** (on page 81)

Example snstRegisterRequest

Here is an example SNST SOAP snstRegisterRequest message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
 xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/
 xmlns:xsd="http://www.w3.org/2001/XMLSchema
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <SOAP-ENV:Header/>
 <SOAP-ENV:Body xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
  <ns1:snstRegisterRequest
 xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
   <CC_Calling_Party_Id>32495000331</CC_Calling_Party_Id>
  </ns1:snstRegisterRequest>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

snstRegisterResult

SNST returns the results of a snstRegister operation in a snstRegisterResult message using the following return parameters:

- **SNST_Result** (on page 84)
- **SNST_Error** (on page 81)

snstRegisterResult error list

This table lists the possible errors returned in the SNST_Error parameter in the snstRegisterResult message.

<table>
<thead>
<tr>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Already Registered</td>
<td>The SNST subscriber is already in a Registered state.</td>
</tr>
<tr>
<td>Number Extraction</td>
<td>The MSISDN in the CC_Calling_Party_Id field of the received</td>
</tr>
<tr>
<td>Failure</td>
<td>snstRegisterRequest operation is not valid.</td>
</tr>
<tr>
<td>Provisioning Error</td>
<td>An error occurred during account creation or processing profile tag updates for the account.</td>
</tr>
<tr>
<td>Error</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Internal Failure</td>
<td>An internal application error occurred.</td>
</tr>
</tbody>
</table>

**Example snstRegisterResult**

Here is an example SNST SOAP `snstRegisterResult` message:

```xml
Date: Wed, 20 Jul 2011 08:04:42 GMT
Server: Oracle OSD
Content-Length: 443
Content-Type: text/xml
Connection: close

<?xml version="1.0"?>
<SOAP-ENV:Envelope
 xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 xmlns:SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
<SOAP-ENV:Body>
<m:snstRegisterResult
 xmlns:m="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
<SNST_Result>OK</SNST_Result>
</m:snstRegisterResult>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

**snstRemoveFriend**

**About snstRemoveFriend**

Use the `snstRemoveFriend` WSDL operation to remove a single Phone Friend from the SNST subscriber's Phone Friend lists. The `snstRemoveFriend` operation comprises the following messages:

- `snstRemoveFriendRequest`
- `snstRemoveFriendResult`
- `snstRemoveFriendFault`

For more information on fault messages such as `snstRemoveFriendFault`, see *WSDL operation fault messages* (on page 63).

**snstRemoveFriendRequest**

To remove a phone friend from the subscriber's phone friend lists, you send the `snstRemoveFriendRequest` message to the SNST using the following parameters:

- `CC_Calling_Party_Id` (on page 81)
- `SNST_Friend` (on page 82)

**Example snstRemoveFriendRequest**

Here is an example SNST SOAP `snstRemoveFriendRequest` message:

```xml
<?xml version="1.0"?>
 xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
<SOAP-ENV:Header/>
<SOAP-ENV:Body xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
```
snstRemoveFriendRequest

SNST returns the results of a snstRemoveFriend operation in a snstRemoveFriendResult message using the following return parameters:

- SNST_Result (on page 84)
- SNST_Error (on page 81)

snstRemoveFriendResult error list
This table lists the possible errors returned in the SNST_Error parameter in the snstRemoveFriendResult message.

<table>
<thead>
<tr>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friend Not Found</td>
<td>The friend to be removed cannot be found in the subscriber's friends lists.</td>
</tr>
<tr>
<td>Not Registered</td>
<td>The snstRemoveFriendRequest operation is only allowed for Registered SNST subscribers.</td>
</tr>
<tr>
<td>Provisionning Error</td>
<td>An error occurred during removal of the friend from the subscriber's friend lists in the subscriber's profile.</td>
</tr>
<tr>
<td>Daily Friend Change Limit Exceeded</td>
<td>The maximum number of friend changes (10) has been exceeded within 24 hours.</td>
</tr>
<tr>
<td>Internal Failure</td>
<td>An internal application error occurred.</td>
</tr>
</tbody>
</table>

Example snstRemoveFriendResult
Here is an example SNST SOAP snstRemoveFriendResult message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
 xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
 <SOAP-ENV:Body>
  <m:snstRemoveFriendResult
   xmlns:m="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
   <SNST_Result>OK</SNST_Result>
  </m:snstRemoveFriendResult>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

snstStatus

About snstStatus

Use the snstStatus WSDL operation to query the status of a subscriber. The snstStatus operation comprises the following messages:

- snstStatusRequest
- snstStatusResult
Chapter 10

- snstStatusFault
For more information on fault messages such as snstStatusFault, see WSDL operation fault messages (on page 63).

**snstStatusRequest**

To query the status of a SNST subscriber, you send the snstStatusRequest message to the SNST using the following parameter:

- **CC_Calling_Party_Id** (on page 81)

**Example snstStatusRequest**

Here is an example SNST SOAP snstStatusRequest message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
    xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <SOAP-ENV:Header/>
    <SOAP-ENV:Body xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
        <ns1:snstStatusRequest
            xmlns:ns1="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
            <CC_Calling_Party_Id>32495000331</CC_Calling_Party_Id>
        </ns1:snstStatusRequest>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

**snstStatusResult**

SNST returns the results of a snstStatus operation in a snstStatusResult message using the following return parameters:

- **SNST_Result** (on page 84)
- **SNST_Error** (on page 81)

**snstStatusResult error list**

This table lists the possible errors returned in the SNST_Error parameter in the snstStatusResult message.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown Status</td>
<td>The status of the subscriber can not be retrieved.</td>
</tr>
</tbody>
</table>

**Example snstStatusResult**

Here is an example SNST SOAP snstStatusResult message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
    xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <SOAP-ENV:Header/>
    <SOAP-ENV:Body>
        <m:snstStatusResult
            xmlns:m="http://10.38.244.142/wsdls/OCNCCtemplate/SNST.wsdl">
            <SNST_Result>Registered</SNST_Result>
        </m:snstStatusResult>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```
WSDL Message Parameters

About WSDL message parameters

This section lists the available parameters that can be used in the messages sent in SNST WSDL operations.

**CC_Calling_Party_Id**

**Syntax:**

```
<CC_Calling_Party_Id>Subscriber_ID_Number</CC_Calling_Party_Id>
```

**Description:**

*Subscriber_ID_Number* is The subscriber ID of the SNST subscriber.

**Type:**

Integer

**Optionality:**

Mandatory.

**Allowed:**

An existing SNST subscriber ID number.

**Default:**

None

**Notes:**

Example:

```
<CC_Calling_Party_Id>012345678</CC_Calling_Party_Id>
```

**SNST_Bundle**

**Syntax:**

```
<SNST_Bundle>Bundle_Name</SNST_Bundle>
```

**Description:**

*Bundle_Name* is the name of the service bundle that can be purchased. The standard bundle names that are configured automatically for SNST are "SNST Bundle 1" to "SNST Bundle 7"

**Type:**

String

**Optionality:**

Mandatory.

**Allowed:**

An existing SNST bundle name.

**Default:**

None

**Notes:**

Example:

```
<SNST_Bundle>SNST Bundle 1</SNST_Bundle>
```

**SNST_Error**

**Syntax:**

```
<SNST_Error>error_string</SNST_Error>
```

**Description:**

*error_string* contains the error description if the operation failed.

**Type:**

String

**Optionality:**

Optional.

**Allowed:**

None

**Default:**

None

**Notes:**

Example:

```
<SNST_Error>Internal Failure</SNST_Error>
```
SNST_Friend

Syntax: 

```xml
<SNST_Friend>Number</SNST_Friend>
```

Description: 

`Number` is the MSISDN of the friend or called party. This is:

- The number to call for snstClick2CallRequest messages.
- The number to send SMS messages to, for snstClick2SMSRequest messages.
- The number to send the invitation to, for snstInviteRequest messages.
- The number for the friend you want to nominate, for snstNominateRequest messages.
- The number to remove, for snstRemoveFriendRequest messages.

Type: Integer
Optionality: Mandatory.
Allowed: None
Default: None
Notes:

Example: 

```xml
<SNST_Friend>0987654321</SNST_Friend>
```

SNST_Friend_List

Syntax: 

```xml
<SNST_Friend_List>
  <number>Number</number>
  <number>Number</number>
  ...
</SNST_Friend_List>
```

Description: 

`Number` is the MSISDN to add to the subscriber's Phone Friend list. Each number in the list must be specified within the `<SNST_Friend_List>` container using the `<number>Number</number>` syntax.

Type: Integer list
Optionality: Mandatory.
Allowed: None
Default: None
Notes:

Example: 

```xml
<SNST_Friend_List><number>01234567</number><number>01234568</number></SNST_Friend_List>
```

SNST_Friend_List_Added_Off-net

Syntax: 

```xml
<SNST_Friend_List_Added_Off-net>
  <number>Number</number>
</SNST_Friend_List_Added_Off-net>
```

Description: 

`Number_List` is the list of numbers included in the subscriber's Added Off-net List. Numbers are included in the list using the following syntax:

```xml
<number>Integer</number> where Integer is the MSISDN of a subscriber's friend.
```

Type: Integer list
Optionality: Optional
Allowed: None
Default: None
Notes:

Example: 

```xml
<SNST_Friend_List_Added_Off-net><number>32495000001</number><number>32495000002</number></SNST_Friend_List_Added_Off-net>
```
SNST_Friend_List_Added_On-net
Syntax:  
<SNST_Friend_List_Added_On-net>
  <Number_List/></SNST_Friend_List_Added_On-net>
Description:  
Number_List is the list of numbers included in the subscriber's Added On-net List. Numbers are included in the list using the following syntax:  
<number>Integer<number> where Integer is the MSISDN of a subscriber's friend.
Type:  
Integer list
Optionality:  
Optional
Allowed:  
None
Default:  
None
Notes:  
Example:  
<SNST_Friend_List_Added_On-net><number>32495000001</number><number>32495000002</number></SNST_Friend_List_Added_On-net>

SNST_Friend_List_Received
Syntax:  
<SNST_Friend_List_Received>
  <Number_List/></SNST_Friend_List_Received>
Description:  
Number_List is the list of numbers included in the subscriber's Received List. Numbers are included in the list using the following syntax:  
<number>Integer<number> where Integer is the MSISDN of a subscriber's friend.
Type:  
Integer list
Optionality:  
Optional
Allowed:  
None
Default:  
None
Notes:  
Example:  
<SNST_Friend_List_Received><number>32495000001</number><number>32495000002</number></SNST_Friend_List_Received>

SNST_Friend_List_Added_Off-net
Syntax:  
<SNST_Friend_List_Added_Off-net_Size>
  <List_Size/></SNST_Friend_List_Added_Off-net_Size>
Description:  
List_Size is the number of entries in the subscriber's Added Off-net List.
Type:  
Integer
Optionality:  
Mandatory
Allowed:  
None
Default:  
None
Notes:  
Example:  
<SNST_Friend_List_Added_Off-net_Size>3</SNST_Friend_List_Added_Off-net_Size>

SNST_Friend_List_Added_On-net_Size
Syntax:  
<SNST_Friend_List_Added_On-net_Size>
  <List_Size/></SNST_Friend_List_Added_On-net_Size>
Description:  
List_Size is the number of entries in the subscriber's Added On-net List.
Type:  
Integer
Optionality:  
Mandatory
Chapter 10

SNST_Friend_List_Added_Off-net
Syntax:  
<SNST_Friend_List_Received_Size>
<number>List_Size</SNST_Friend_List_Received_Size>
Description:  
List_Size is the number of entries in the subscriber's Received List.
Type:  
Integer
Optionality:  
Mandatory
Allowed:  
None
Default:  
None
Notes:  
Example:  
<SNST_Friend_List_Received_Size>1</SNST_Friend_List_Received_Size>

SNST_Message
Syntax:  
<SNST_Message>Message_String</SNST_Message>
Description:  
Message_String is the actual text of the SMS.
Type:  
String
Optionality:  
Mandatory.
 Allowed:  
None
Default:  
None
Notes:  
Example:  
<SNST_Message>Hi, dear friend</SNST_Message>

SNST_Result
Syntax:  
<SNST_Result>Result_String</SNST_Result>
Description:  
Result_String contains the status of the executed operation. For operations other than snstStatus, there are two possible results:

- "OK" - the operation has been successfully executed.
- "Error" - a fault occurred during the operation. The error description is given in the SNST_Error parameter.

For the snstStatus operation, the following results are possible:

- "Unregistered" - the subscriber is not registered and On-net.
- "Registered" - the subscriber is registered and On-net.
- "Deactivated" - the subscriber has stopped the SNST service.
- "Unregistered Off-Net" - the subscriber is not registered and Off-net.
- "Registered Off-net" - the subscriber is registered and Off-net.
Type:  
String
Optionality:  
Mandatory.
 Allowed:  
None
Default:  
None
Notes:  
Example:  
<SNST_Result>OK</SNST_Result>
SNST Verification SMS

Verification SMS

A web portal application can submit SMS messages to the SNST through SMPP. The SMPP destination address is set to the MSISDN of an SNST subscriber. The SMPP User Data is set to the verification string that must be passed to the subscriber.

The web portal application issues an authentication verification string to a subscriber. To achieve this, the SNST receives an SMPP Submit message from the web portal application. An optional notification message can be wrapped around the user data passed by the web portal application.

Verification SMS template

You can define a notification template which will be a wrapper around the verification string, prior to delivering the SMS.

Example: Here is an example of the notification ‘SNST Verification SMS’.

Thank you for your request. Your verification string is 9c34f. Please enter this string now on the web page.

Note: Notification SMS messages are configured on the Notifications tab of the ACS Resources screen. For more information, see ACS User's Guide.
Overview

Introduction

This chapter describes the predefined User Profiles configured in the Oracle Communications Network Charging and Control (NCC) UI for different types of Social Networking Service Template (SNST) users, and explains what functionality is available to each type of user.

In this chapter

This chapter contains the following topics.

User Profiles

User Profiles

About user profiles

The SNST UI provides access to all SNST subscriber details, and the ability to perform changes to SNST subscriber accounts.

When you add a SNST user to the system, you specify the User Profile they will use. The User Profile defines which screens in the SNST UI that the user will be able to access, and the type of access available to them (for example, whether they will have read-write access).

Note: User profiles are configured in the NCC UI on the SMS User Management screen. For more information on configuring user profiles in SMS, see SMS User’s Guide.

The SNST includes three predefined User Profiles, each having a different level of system access:

- SNST_CSR - Customer Support Representative (CSR) users
- SNST_Operator - Operations users
- SNST_Administrator - Administrator users

CSR

Customer Support Representatives (CSR) are in direct contact with subscribers who call the operator support line. CSR profiles have access to all subscriber data (personal details, wallet and balance status, service subscriptions, last calls made or SMSs sent, and so on), and are able to award Service Bundle credits to subscribers. CSR users have the following levels of access to SNST subscriber data:

- Read-write access to data that is not related to the balances of the subscriber.
- Read-only access (no modifications can be made) to data related to subscriber balances.

A user who is linked to the CSR user profile has the following levels of access to the following Subscriber details:

- Read-write access to Phone Friend lists (On/Off-net Added List, Received List, Best Friend List).
- Read-only access to Service Bundle Balance credits.
- Read-write access to SNST Status and Off-net type.
Chapter 11

- Read-only access to SNST Retention Reward status.

The CSR user also has:

- Read-only access to the last call records (EDR) of each subscriber.
- Execute access to the BPLs that process Service Bundle awards.

**Operations**

Operations staff (or 2nd line support) have access to the same features as CSR, with additional access to a wider range of system configurations, including discount configuration, service settings, service bundle configuration.

A user linked to the Operations user profile has access to the same features as the CSR user profile, with the following additions:

- Read-write access to Service Bundle Balance credits.
- Access to all important system configuration features, including SNST keyword definitions, Service Bundle configuration, SNST Discount, Retention and Referral Reward number ranges, and so on.
- Ability to execute SNST logic for the following actions:
  - Number Change
  - Purchase Service Bundle
  - Add Friend
  - Remove Friend
  - Registration and Re-registration
  - Deactivation
  - Invite Off-net subscriber
  - Nominate Best Friend
  - Port In
  - Port Out
- Access to the alarm and statistics viewer.

**Administrator**

Administrator users have access to the same features as Operations users. In addition, they are able to create new SNST users on the system with one of the three predefined User Profiles:

- **SNST_CSR** - for CSR users
- **SNST_Operator** - for Operations users
- **SNST_Administrator** - for Administrator users
Overview

Introduction

This chapter describes the Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) User Interface (UI). The available screens in the SNST UI have been built using the Subscriber Profile Manager (SPM) and are automatically installed by the SNST template.

This chapter describes:

- The configuration available in the Edit Subscriber screen for an SNST subscriber.
- The SNST configuration settings available at a product type level in the Edit Product Type screen.

In this chapter

This chapter contains the following topics.

- Edit Subscriber Screen for SNST Subscribers 89
- SNST Product Type Configuration 92

Edit Subscriber Screen for SNST Subscribers

Introduction

The Edit Subscriber screen in the NCC UI enables you to edit a subscriber's configuration. When you install the SNST template, an additional SNST configuration option is provided in the Edit Subscriber screen. Depending on your user profile this will enable you to either view, or view and update the configuration details for SNST subscribers.

For more information on configuring subscribers in NCC, see CCS User's Guide. For more information on SNST user profiles, see SNST User Profiles (on page 87).

Accessing SNST subscriber details

Follow these steps to access the details of an SNST subscriber in the NCC Edit Subscriber screen.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Browse to the NCC Service Management System screen and select Prepaid Charging-&gt;Subscriber Management from the Services menu.</td>
</tr>
<tr>
<td>2</td>
<td>In the Subscriber Management screen, select the Service Provider from the drop down box.</td>
</tr>
<tr>
<td>3</td>
<td>On the Subscriber tab, search for the subscriber to view or edit.</td>
</tr>
<tr>
<td>4</td>
<td>Highlight the row in the search results for the required subscriber.</td>
</tr>
<tr>
<td>5</td>
<td>Click Edit.</td>
</tr>
</tbody>
</table>

Result: You see the Edit Subscriber screen.
Step | Action
--- | ---
6 | Select the **SNST** option from the left hand menu in the Edit Subscriber screen.  
**Result:** You see the SNST configuration details for the selected SNST subscriber. For an example screen, see *Example SNST subscriber configuration* (on page 90).

7 | If required, edit the subscriber configuration by editing the fields on this screen. For a description of each field, see *SNST subscriber configuration fields* (on page 91).

8 | Click **Save**.

**Example SNST subscriber configuration**

Here is an example Edit Subscriber screen showing the available configuration fields when you select the SNST option in the Edit Subscriber screen.
Scroll down the screen to see the following additional SNST configuration fields.

### SNST subscriber configuration fields

This table describes the function of the SNST fields that become available in the Edit Subscriber screen when you select the SNST option.

**Note:** Depending on the user profile, the fields will be protected with read-only rights or read-write rights.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Status Code</td>
<td>The status of the SNST subscriber. One of:</td>
</tr>
<tr>
<td></td>
<td>- Unregistered</td>
</tr>
<tr>
<td></td>
<td>- Registered</td>
</tr>
<tr>
<td></td>
<td>- Deactivated</td>
</tr>
<tr>
<td>Off-net Network Type</td>
<td>This is the MNC network code used for Off-net SNST subscribers.</td>
</tr>
<tr>
<td></td>
<td>The field is blank when the subscriber is On-net.</td>
</tr>
<tr>
<td>Has Registered Before</td>
<td>Indicates whether this subscriber has been previously registered.</td>
</tr>
<tr>
<td>Pending Registration</td>
<td>Indicates whether the subscriber has requested a registration that has not</td>
</tr>
<tr>
<td></td>
<td>been confirmed yet.</td>
</tr>
<tr>
<td>snstRegister</td>
<td>Click this button to initiate a BPL in order to register the SNST subscriber.</td>
</tr>
<tr>
<td>snstDeactivate</td>
<td>Click this button to initiate a BPL in order to deactivate the SNST subscriber.</td>
</tr>
<tr>
<td>snstAddFriends</td>
<td>Click this button to initiate a BPL in order to add new friends to the SNST subscriber.</td>
</tr>
<tr>
<td>Function</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>snstAddBestFriend</td>
<td>Click this button to initiate a BPL in order to add a Best Friend to the SNST subscriber.</td>
</tr>
<tr>
<td>snstBundle</td>
<td>Click this button to initiate a BPL in order to purchase a service bundle for the SNST subscriber.</td>
</tr>
<tr>
<td>Friend Change Count</td>
<td>Number of friend changes (added, deleted friends, and so on) done in one day.</td>
</tr>
<tr>
<td>Last Reset</td>
<td>Date when the SNST Friend Changes count was last reset to zero.</td>
</tr>
<tr>
<td>Added On-net Friend List</td>
<td>List containing the On-net friends, where the friend link was requested by this subscriber.</td>
</tr>
<tr>
<td>Added Off-net Friend List</td>
<td>List containing the Off-net friends, where the friend link was requested by this subscriber.</td>
</tr>
<tr>
<td>Received Friend List</td>
<td>List containing the received friends where the friend link was requested by the friend subscriber.</td>
</tr>
<tr>
<td>Best Friend List</td>
<td>Lists all friends with whom this subscriber has a best friend relationship.</td>
</tr>
<tr>
<td>Invited Referral List</td>
<td>List of friends to whom this subscriber has created a referral (has sent an invitation).</td>
</tr>
<tr>
<td>Received Referral List</td>
<td>List of friends that this subscriber has received a referral from (in case the SNST subscriber is/was off-net and received an invitation).</td>
</tr>
<tr>
<td>Subscription On-net</td>
<td>This displays the status of the On-net Subscription periodic charge. The on-net subscriber is subscribed to this periodic charge after having confirmed the registration request.</td>
</tr>
<tr>
<td>Subscription Off-net</td>
<td>This displays the status of the Off-net Subscription periodic charge. The off-net subscriber is subscribed to this periodic charge after having nominated an on-net friend from whom he received a referral.</td>
</tr>
<tr>
<td>Retention Reward 1–4</td>
<td>These fields display the status of the Influential Atom Reward periodic charges.</td>
</tr>
<tr>
<td>Pressured Atom Reward</td>
<td>This field displays the status of the Pressured Atom Reward periodic charge.</td>
</tr>
</tbody>
</table>

**SNST Product Type Configuration**

**Introduction**

The Edit Product Type screen in the NCC UI enables you to change the configuration of the selected Product Type. When you install the SNST template, the following additional SNST configuration options are provided in the Edit Product Type screen:

- SNST Config
- SNST Discounts
- SNST Referral Scheme
- SNST Retentions Scheme

For more information on configuring product types in NCC, see *CCS User's Guide.*
Accessing SNST product type configuration

Follow these steps to access configuration details for SNST product types in the Edit Product Type screen.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Browse to the NCC Service Management System screen and select Prepaid Charging- &gt;Subscriber Management from the Services menu.</td>
</tr>
<tr>
<td>2</td>
<td>In the Subscriber Management screen, select the Service Provider from the drop down box.</td>
</tr>
<tr>
<td>3</td>
<td>On the Product Type tab, search for the Product Type to view or edit.</td>
</tr>
<tr>
<td>4</td>
<td>Select the product type in the search results, and click Edit.</td>
</tr>
<tr>
<td><strong>Result:</strong></td>
<td>You see the Edit Product Type screen.</td>
</tr>
<tr>
<td>5</td>
<td>Under the Profiles option in the left hand panel, you see the available configuration options for SNST product types.</td>
</tr>
<tr>
<td></td>
<td>To view or edit the configuration, select the relevant option. For details on the fields available in each option see:</td>
</tr>
<tr>
<td></td>
<td>• SNST Config product type fields (on page 94)</td>
</tr>
<tr>
<td></td>
<td>• SNST Discounts product type fields (on page 95)</td>
</tr>
<tr>
<td></td>
<td>• SNST Referral Scheme product type fields (on page 96)</td>
</tr>
<tr>
<td></td>
<td>• SNST Retention Schemes product type fields (on page 97)</td>
</tr>
<tr>
<td>6</td>
<td>Amend the SNST Product Type details as required.</td>
</tr>
<tr>
<td>7</td>
<td>Click Save.</td>
</tr>
</tbody>
</table>
Example SNST Config Profile option panel

Here is an example SNST Config Profile option in the Edit Product Type screen.

SNST Config product type fields

This table describes the function of the fields that become available when you select the SNST Config Profile option in the Edit Product Type screen.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Added Friend List Size</td>
<td>The maximum number of friends a subscriber can have across both their Added lists.</td>
</tr>
<tr>
<td>Risk Reward</td>
<td>Determines whether the Risk Reward logic will be applied when a subscriber ports out.</td>
</tr>
<tr>
<td>SNST Bundle 1 – 7</td>
<td>Displays the name of the bundle or voucher type that will be credited to the subscriber when they purchase bundle 1 to bundle 7.</td>
</tr>
</tbody>
</table>
Example SNST Discounts Profile option panel

Here is an example SNST Config Profile option in the Edit Product Type screen.

### SNST Discounts product type fields

This table describes the function of the fields that become available when you select the SNST Discounts Profile option in the Edit Product Type screen.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST Voice Discount</td>
<td>Sets the discount given on the cost of a voice call to a SNST Friend.</td>
</tr>
<tr>
<td>SNST SMS Discount</td>
<td>Sets the discount given on the cost of sending a SMS to a SNST Friend.</td>
</tr>
<tr>
<td>SNST Best Friend Voice Discount</td>
<td>Sets the discount given on the cost of a voice call to a SNST Best Friend.</td>
</tr>
<tr>
<td>SNST Best Friend SMS Discount</td>
<td>Sets the discount given on the cost of sending a SMS to a SNST Best Friend.</td>
</tr>
</tbody>
</table>
Example SNST Referral Scheme Profile option panel

Here is an example SNST Referral Scheme Profile option in the Edit Product Type screen.

SNST Referral Scheme product type fields

This table describes the function of the fields that become available when you select the SNST Referral Scheme Profile option in the Edit Product Type screen.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST Referral Reward</td>
<td>Displays the name of the voucher type that will be awarded to the off-net subscriber porting in, after nominating an on-net subscriber as Best Friend.</td>
</tr>
<tr>
<td>SNST Referrer Reward</td>
<td>Displays the name of the voucher type that will be awarded to the on-net subscriber after being nominated as Best Friend by an off-net subscriber porting in.</td>
</tr>
</tbody>
</table>
Example SNST Retention Schemes Profile option panel

Here is an example SNST Retention Scheme Profile option in the Edit Product Type screen.

SNST Retention Schemes product type fields

This table describes the function of the fields that become available when you select the SNST Retention Schemes Profile option in the Edit Product Type screen.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST influential Atom Reward Level 1 - 4</td>
<td>The minimum number of Received friends to have in order to receive the influential atom reward 1 - 4.</td>
</tr>
<tr>
<td>&quot;or more Received =&gt; Reward1 - 4&quot;</td>
<td>Displays the name of the influential atom reward level 1 – 4 that will be given to the subscriber on reaching the corresponding influential Atom Reward Level.</td>
</tr>
<tr>
<td>SNST Pressured Atom Reward Threshold</td>
<td>The minimum number of Off-net Added friends to have in order to receive the pressured atom reward.</td>
</tr>
<tr>
<td>&quot;or more Added Off-net =&gt; Reward&quot;</td>
<td>The name of the pressured atom reward that will be given to the subscriber when the minimum number of Off-net Added friends has been exceeded.</td>
</tr>
</tbody>
</table>
Overview

Introduction

This chapter explains how Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) business intelligence is collected.

In this chapter

This chapter contains the following topics.

About SNST Business Intelligence

About SNST Business Intelligence

SNST business intelligence

The SNST is designed to stimulate on-net subscribers through innovative tariff plan schemes, service bundles and personalized rewards. Using an automated process the SNST gathers Business Intelligence on subscriber relationships, including information on strong bonds between users for both on-net and off-net subscribers.

This information can be used specifically for retention campaigns for on-net subscribers, and also for acquisition campaigns for targeting off-net subscribers.

SNST business intelligence aids acquisition by:

- Using the operator’s own valuable subscriber base to gather intelligence.
- Highlighting strong acquisition targets through their existing customer base.
- Producing Off-net SNST Index reports to detail the value of targets.
- Providing automated rewards to the acquired subscriber.

SNST business intelligence aids retention by:

- Highlighting the most influential atoms amongst circles of friends.
- Highlighting pressured atoms.
- Producing On-net SNST Index reports to highlight value rating.
- Providing specific rewards to this micro-segment.
- Focusing on increasing usage and by keeping the valuable subscriber
Chapter 14
Social Networking Service Template Configuration

Overview

Introduction

This chapter provides details on the configuration used to define the Oracle Communications Network Charging and Control (NCC Social Networking Service Template (SNST) service.

In this chapter

This chapter contains the following topics.
- SNST Generic Concepts 101
- SNST Product Type Profile Data 103
- SNST Global Configuration 106
- SNST Reports 108
- SNST Control Plans 108
- Detailed Control Plan Logic 114
- SNST_SMS_Keyword Control Plan 116
- Registration Sub Control Plan 118

SNST Generic Concepts

NCC nodes

An SNST solution is composed of the standard components that form a typical NCC environment:

- SMS
- One or more VWS pairs
- One or more SLC nodes

SNST network integration

This table describes the network integration required for specific features of the SNST service.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Network Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice</td>
<td>SLC is triggered in Camel 2 or 3, over M3UA or SUA, using the Sigtran component (sua_if). The Service Key is routed to a CCS Service (ccsSvcLoader).</td>
</tr>
<tr>
<td>IVR</td>
<td>The SLC will use ETC to connect the A-party to the IVR. The IVR is expected to query the SLC in INAP CS1 with ARI.</td>
</tr>
<tr>
<td>HLR Query</td>
<td>The ‘Store My Network ID’ feature node from the LCP component is used to send an SRI to the HLR. The node uses the Sigtran component (sua_if).</td>
</tr>
</tbody>
</table>
Inbound SMS

The Messaging Manager (xmsTrigger) component is used. MAP (through the Sigtran component), EMI and SMPP can be used. Messaging Manager will trigger a SLEE Service Key routed to a CCS Service (ccsSvcLoader).

Outbound SMS

The Messaging Manager (xmsTrigger) component is used. MAP (through the Sigtran component), EMI and SMPP can be used. Messaging Manager will trigger a SLEE Service Key routed to a CCS Service (ccsSvcLoader).

### SNST subscriber profile data

SNST profile tags are mapped to the CCS Subscriber Profile Block in the ACS Profile Tag Mappings. They can be viewed (and modified, depending on SMF template access rights) in the Prepaid Charging Edit Subscriber screens in the SNST panel.

**Note:** The SNST panel is an additional panel configured through the Subscriber Profile Manager.

Profile tags can also be retrieved and updated by:

- Using the standard CCSCD9 PI command.
- From the Control Plans that implement the SNST self-care service logic.

The following SNST subscriber information is held in profile tags:

- Friend lists
- Subscription status

Subscribers can have their CCS subscriber profile populated with a number of additional tags as well. For details, see *Additional subscriber profile tags* (on page 102).

### Friend lists

SNST revolves around the friend-link relationships between subscribers. To satisfy all SNST functionality, friends are split across three lists:

- On-net friends list, where the friend link was requested by this subscriber.
- Off-net friends list, where the friend link was requested by this subscriber.
- A friends list where the friend link was requested by the friend subscriber.

Each list maps to a Limited Ordered Prefix Tree profile tag. Each SNST subscriber will have a CCS subscriber account with all tags in the profile block.

### Subscription status

Each CCS subscriber account holds the SNST Subscription Status. This determines whether or not the subscriber is subscribed to SNST.

This information is kept in String profile tags.

### Additional subscriber profile tags

This table describes the available additional subscriber profile tags.

<table>
<thead>
<tr>
<th>Profile Tag Name</th>
<th>Tag Type</th>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST Friend List Added On-net</td>
<td>Limited Ordered Prefix Tree</td>
<td>1310750</td>
<td>See Friend lists (on page 102).</td>
</tr>
<tr>
<td>SNST Friend List Added Off-net</td>
<td>Limited Ordered Prefix Tree</td>
<td>1310751</td>
<td>See Friend lists.</td>
</tr>
</tbody>
</table>
### SNST Product Type Profile Data

#### Product type profile block

A significant number of profile tags are created and mapped to the Product Type profile block. You can view or modify the profile tag values in additional SPM groups included in the Product Type Profile panel in the CCS Product Type screen. This means you can easily modify a large number of SNST service parameters without modifying the control plans. The control plans can then read the required values from the Product Type profile.

**Note:** The SNST configuration only sets up a single Product Type named "SNST".

#### Profile tag groups

Product Type profile tags can be split into four groups, that correspond to four different SPM groups in the Product Type screen:

- SNST Config for general configuration
- SNST Discounts for discount configuration
- SNST Referral Scheme for referral configuration
- SNST Retention Schemes for retention scheme configuration

<table>
<thead>
<tr>
<th>Profile Tag Name</th>
<th>Tag Type</th>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST Friend List Received</td>
<td>Limited Ordered Prefix Tree</td>
<td>1310754</td>
<td>See Friend lists.</td>
</tr>
<tr>
<td>SNST Service Status</td>
<td>String</td>
<td>1310752</td>
<td>See Friend lists.</td>
</tr>
<tr>
<td>SNST Off-Net Type</td>
<td>String</td>
<td>1310756</td>
<td>For off-net subscribers, the MNC part of their IMSI.</td>
</tr>
<tr>
<td>SNST Has Registered</td>
<td>Boolean</td>
<td>1310862</td>
<td>Indicates whether this subscriber had been previously registered.</td>
</tr>
<tr>
<td>SNST Pending Registration</td>
<td>Boolean</td>
<td>1310799</td>
<td>Indicates whether subscriber has requested a registration but hasn't confirmed yet.</td>
</tr>
<tr>
<td>SNST Best Friend List</td>
<td>Limited Ordered Prefix Tree</td>
<td>1310748</td>
<td>Lists all friends with whom this subscriber has a best friend relationship.</td>
</tr>
<tr>
<td>SNST Invited Referral List</td>
<td>Limited Ordered Prefix Tree</td>
<td>1310758</td>
<td>List of friends to whom this subscriber has created a referral.</td>
</tr>
<tr>
<td>SNST Referral Received List</td>
<td>Limited Ordered Prefix Tree</td>
<td>1310831</td>
<td>List of friends that this subscriber has received a referral from.</td>
</tr>
<tr>
<td>SNST Friend Changes</td>
<td>Integer</td>
<td>1310778</td>
<td>Number of friend changes (added friends, deleted friends, and so on) done in one day.</td>
</tr>
<tr>
<td>SNST Friend Changes Reset</td>
<td>Date</td>
<td>1310764</td>
<td>Date where the SNST Friend Changes count will be reset again to zero.</td>
</tr>
</tbody>
</table>
### General configuration tags

This table describes the general SNST configuration profile tags.

<table>
<thead>
<tr>
<th>Profile Tag Name</th>
<th>Tag Type</th>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST Friend List Added Size</td>
<td>Integer</td>
<td>1310842</td>
<td>The maximum number of friends a subscriber can have across both his Added lists.</td>
</tr>
<tr>
<td>SNST Risk Reward</td>
<td>Boolean</td>
<td>1310860</td>
<td>Determines whether the Risk Reward logic will be applied (when a subscriber ports out).</td>
</tr>
<tr>
<td>SNST Bundle 1</td>
<td>String</td>
<td>1310763</td>
<td>Contains the name of the bundle or voucher type that will be credited to the subscriber when he purchases bundle 1.</td>
</tr>
<tr>
<td>SNST Bundle 2</td>
<td>String</td>
<td>1310766</td>
<td>Contains the name of the bundle or voucher type that will be credited to the subscriber when they purchases bundle 2.</td>
</tr>
<tr>
<td>SNST Bundle 3</td>
<td>String</td>
<td>1310769</td>
<td>Contains the name of the bundle or voucher type that will be credited to the subscriber when they purchases bundle 3.</td>
</tr>
<tr>
<td>SNST Bundle 4</td>
<td>String</td>
<td>1310772</td>
<td>Contains the name of the bundle or voucher type that will be credited to the subscriber when they purchases bundle 4.</td>
</tr>
<tr>
<td>SNST Bundle 5</td>
<td>String</td>
<td>1310775</td>
<td>Contains the name of the bundle or voucher type that will be credited to the subscriber when they purchases bundle 5.</td>
</tr>
<tr>
<td>SNST Bundle 6</td>
<td>String</td>
<td>1310791</td>
<td>Contains the name of the bundle or voucher type that will be credited to the subscriber when they purchases bundle 6.</td>
</tr>
<tr>
<td>SNST Bundle 7</td>
<td>String</td>
<td>1310799</td>
<td>Contains the name of the bundle or voucher type that will be credited to the subscriber when they purchases bundle 7.</td>
</tr>
</tbody>
</table>

### Discount configuration tags

This table describes the Discount configuration profile tags.

<table>
<thead>
<tr>
<th>Profile Tag Name</th>
<th>Tag Type</th>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST Discount Voice</td>
<td>Discount</td>
<td>1310762</td>
<td>The discount given on the cost of a voice call to a SNST Friend.</td>
</tr>
<tr>
<td>SNST Discount SMS</td>
<td>Discount</td>
<td>1310765</td>
<td>The discount given on the cost of sending a SMS to a SNST Friend.</td>
</tr>
<tr>
<td>SNST BF Discount Voice</td>
<td>Discount</td>
<td>1310767</td>
<td>The discount given on the cost of a voice call to a SNST Best Friend.</td>
</tr>
<tr>
<td>SNST BF Discount SMS</td>
<td>Discount</td>
<td>1310768</td>
<td>The discount given on the cost of sending a SMS to a SNST Best Friend.</td>
</tr>
</tbody>
</table>
### Referral scheme configuration tags

This table describes the Referral Scheme configuration profile tags.

<table>
<thead>
<tr>
<th>Profile Tag Name</th>
<th>Tag Type</th>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST Referral SB</td>
<td>String</td>
<td>1310872</td>
<td>Contains the name of the voucher type that will be awarded to the Off-net subscriber that ports in, after they have nominated an On-net subscriber as Best Friend.</td>
</tr>
<tr>
<td>SNST Referrer SB</td>
<td>String</td>
<td>1310788</td>
<td>Contains the name of the voucher type that will be awarded to the On-net subscriber, after they have been nominated as Best Friend by an Off-net subscriber who ports in.</td>
</tr>
</tbody>
</table>

### Referral scheme configuration tags

This table describes the Retention Scheme configuration profile tags.

<table>
<thead>
<tr>
<th>Profile Tag Name</th>
<th>Tag Type</th>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST Influential Atom Reward 1 Min</td>
<td>Integer</td>
<td>1310855</td>
<td>The minimum number of Received friends to have to receive the influential atom reward level 1.</td>
</tr>
<tr>
<td>SNST Influential Atom Reward SB</td>
<td>String</td>
<td>1310866</td>
<td>The name of the influential atom reward level 1.</td>
</tr>
<tr>
<td>SNST Influential Atom Reward 2 Min</td>
<td>Integer</td>
<td>1310856</td>
<td>The minimum number of Received friends to have to receive the influential atom reward level 2.</td>
</tr>
<tr>
<td>SNST Influential Atom Reward 2 SB</td>
<td>String</td>
<td>1310867</td>
<td>The name of the influential atom reward level 2.</td>
</tr>
<tr>
<td>SNST Influential Atom Reward 3 Min</td>
<td>Integer</td>
<td>1310857</td>
<td>The minimum number of Received friends to have to receive the influential atom reward level 3.</td>
</tr>
<tr>
<td>SNST Influential Atom Reward 3 SB</td>
<td>String</td>
<td>1310868</td>
<td>The name of the influential atom reward level 3.</td>
</tr>
<tr>
<td>SNST Influential Atom Reward 4 Min</td>
<td>Integer</td>
<td>1319858</td>
<td>The minimum number of Received friends to have to receive the influential atom reward level 4.</td>
</tr>
<tr>
<td>SNST Influential Atom Reward 4 SB</td>
<td>String</td>
<td>1319869</td>
<td>The name of the influential atom reward level 4.</td>
</tr>
<tr>
<td>SNST Pressured Atom Reward Min</td>
<td>Integer</td>
<td>1310848</td>
<td>The minimum number of Off-net Added friends to have to receive the pressured atom reward.</td>
</tr>
<tr>
<td>SNST Pressured Atom Reward SB</td>
<td>String</td>
<td>1310876</td>
<td>The name of the pressured atom reward.</td>
</tr>
</tbody>
</table>
SNST Global Configuration

About SNST global configuration

A number of SNST parameters are stored in the CCS Global Config rather than the Product Type config. These parameters are stored here because:

- They may be required in scenarios where no CCS subscriber exists, hence no Product Type profile is loaded.
- The parameter value should be the same across all product types.

As with the parameters stored in the Product Type profile, these parameters are loaded and used in the control plans. This allows them to be updated dynamically without updating any control plans.

Keywords

Every SNST keyword has a corresponding String type profile field in the CCS Global Config block. The string represents the regular expression which will be used to match this keyword.

Example default keyword values

This example output shows the default keyword values.

```
> ./acsProfile -E 1
Connecting as smf/smf.
Decode CCS_GLOBAL_CONFIG.PROFILE where ID = 1

Tag     Desc            Len  HexData...
-----------------------------------------
0x140013 SNST Keyword YES               3    59 45 53
                  YES
0x140014 SNST Keyword ADDED             5    41 44 44 45 44
                  ADDED
0x140015 SNST Keyword STOP              4    53 54 4f 50
                  STOP
0x140016 SNST Keyword REMOVE            6    52 45 4d 4f 56 45
                  REMOVE
0x140017 SNST Keyword QUERY             5    51 55 45 52 59
                  QUERY
0x140019 SNST Keyword REGISTER          8    52 45 47 49 53 54 45 52
                  REGISTER
0x14001a SNST Keyword ALL               3    41 4c 4c
                  ALL
0x140028 SNST Keyword BUNDLE            6    42 55 4e 44 4c 45
                  BUNDLE
0x140083 SNST Keyword INVITE            8    49 4e 56 49 54 45 45
                  INVITE
0x140084 SNST Keyword NOMINATE          8    4e 4f 4d 49 4e 41 54 45
                  NOMINATE
```

Account creation parameters

When dynamically creating a new CCS subscriber account from the control plan, the logic must decide which ACS Customer and which Product Type the account should be created for. The template logic allows the definition of separate ACS customers, product types and billing engine domain IDs for On-net and Off-net subscribers.

Example default values

In this example output, the default example values assume 'OCNCCtemplate' for the ACS customers and 'SNST' for the Product Types, and 1 for the VWS domain IDs.

```
> ./acsProfile -E 1
```
Connecting as smf/smf.
Decode CCS_GLOBAL_CONFIG.PROFILE where ID = 1

<table>
<thead>
<tr>
<th>Tag</th>
<th>Desc</th>
<th>Len</th>
<th>HexData...</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x140027</td>
<td>SNST On-Net PT</td>
<td>4</td>
<td>53 4e 53 54</td>
</tr>
<tr>
<td>0x140041</td>
<td>SNST Off-Net PT</td>
<td>4</td>
<td>53 4e 53 54</td>
</tr>
<tr>
<td>0x14004a</td>
<td>SNST On-Net Domain ID</td>
<td>10</td>
<td>31 20 3a 20 4f 6e 2d 4e 65 74</td>
</tr>
<tr>
<td>0x14004b</td>
<td>SNST Off-Net Domain ID</td>
<td>11</td>
<td>31 20 3a 20 4f 66 66 2d 4e 65 74</td>
</tr>
<tr>
<td>0x14004c</td>
<td>SNST On-Net Customer template</td>
<td>13</td>
<td>4f 43 4e 43 74 65 6d 70 6c 61 74 65</td>
</tr>
<tr>
<td>0x14004d</td>
<td>SNST Off-Net Customer template</td>
<td>13</td>
<td>4f 43 4e 43 74 65 6d 70 6c 61 74 65</td>
</tr>
</tbody>
</table>

Other parameters example
This example output shows these parameters:

- SNST DAP User - defines the user code that the DAP nodes in the control plans on the SLC need to use for http authentication in the SOAP requests sent to the PI on the SMS.
- SNST DAP Pwd - defines the password of the user code that the DAP nodes on the SLC need to use for http authentication in the SOAP requests sent to the PI on the SMS
- SNST Short Code - defines the short code that will be used as the source address for, and as a variable in, SMS notifications sent by the control plans.

> ./acsProfile -E 1

Editing parameter values
Follow these steps to edit SNST parameters stored in the CCS Global Config.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Use the acsProfile command line tool to modify the SNST global configuration.</td>
</tr>
</tbody>
</table>

Example output
<table>
<thead>
<tr>
<th>Tag</th>
<th>Desc</th>
<th>Len</th>
<th>HexData...</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x140036</td>
<td>SNST DAP User</td>
<td>13</td>
<td>59 45 53 7c 79 65 73 7c 4f 4b 7c 6f 6b</td>
</tr>
</tbody>
</table>

Example output

> ./acsProfile -E 1 -W 0x140013 -A "YES|yes|OK|ok"

Connecting as smf/smf.
Decode CCS_GLOBAL_CONFIG.PROFILE where ID = 1

<table>
<thead>
<tr>
<th>Tag</th>
<th>Desc</th>
<th>Len</th>
<th>HexData...</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x140013</td>
<td>SNST Keyword YES</td>
<td>13</td>
<td>59 45 53 7c 79 65 73 7c 4f 4b 7c 6f 6b</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td>yes</td>
<td>OK</td>
</tr>
</tbody>
</table>
SNST Reports

Introduction

This topic describes the available SNST reports.

- SNST Subscriber Detail (on page 108)
- SNST Subscriber Summary (on page 108)
- SNST Usage Summary (on page 108)

Note on reports

For more information on CCS reports, refer to the CCS User's Guide. For information on executing reports, refer to the SMS User's Guide.

SNST Subscriber Detail

The SNST Subscriber Detail report provides detailed information on registered SNST subscribers. For each SNST subscriber, it lists the subscriber MSISDN, status, friend count, and list of friend's MSISDNs.

SNST Subscriber Summary

The SNST Subscriber Summary report summarizes SNST subscriber information. It groups subscribers by service provider and product type and lists their MSISDN, wallet type and number of friends. The report includes SNST balance information for the following cumulative balance categories:

- SNST Calls
- SNST SMS
- SNST service bundles

As this report includes balance information it will create a DB link to the VWS nodes in order to retrieve the wallet and balance information it requires.

Note: If a balance category is empty then a zero value will be included in the report.

SNST Usage Summary

The SNST Usage Summary report details SNST specific statistics over a specified time period such as one month or a year. Example statistics recorded are:

- SNST_REGISTER
- SNST_BLOCK
- SNST_ADD_FRIEND
- SNST_REMOVE_FRIEND
- SNST_QUERY_ALL

SNST Control Plans

About SNST control plans

The Social Networking Service Template includes a number of predefined control plans. SNST control plans fall into four categories:

1 Service control plans. These are control plans that are triggered from the network.
2 BPL control plans. These are triggered by the smsTrigDaemon on the SMS either from the UI or from PI.

3 OSD control plans. These are triggered by the osdInterface on the SLC, initiated by SOAP requests coming from a Web portal.

4 Sub control plans. Sub control plans are not triggered directly, but are executed from inside other control plans. They execute the service logic and are called by service control plans, or by BPL control plans, which typically map one-to-one with many sub control plans. For example: the ‘BPL_SNST_ADD’ control plan calls the ‘SUB_SNST_ADD_FRIEND’ sub control plan.

The naming convention used for SNST control plans is:

- SNST_* for Service control plans
- BPL_SNST_* for BPL control plans
- OSD_SNST_* for OSD control plans
- SUB_SNST_* for SNST sub control plans

**Service control plans**

This table describes the predefined Service control plans.

<table>
<thead>
<tr>
<th>Control Plan Name</th>
<th>Description</th>
<th>Triggered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNST_IVR</td>
<td>IVR Self-Care control plan. Connects to IVR for user interaction.</td>
<td>Service: CCS with CdPN = &lt;IVR shortcode) -&gt; Capability: SMS_IVR Control plan configured in Product Type for this Capability.</td>
</tr>
<tr>
<td>SNST_SMS</td>
<td>Control plan for handling inbound, regular (non self-care) SMS messages (MM triggers the service). Checks for friend-link discount and charges from VWS.</td>
<td>Service: CCS_SM_MO -&gt; Capability: SNST SM MO or SMSMO Control plan configured in Product Type for this Capability.</td>
</tr>
<tr>
<td>SNST_SMS_NONCMX</td>
<td>Control plan for handling inbound, regular (non self-care) SMS messages from unknown subscribers (no CCS account) Simply sends back a Continue operation.</td>
<td>Service: CCS_SM_MO -&gt; Capability: SNST SM MO or SMSMO Default control plan in Capability.</td>
</tr>
<tr>
<td>SNST_VOICE</td>
<td>Control plan for handling MO Voice calls. Checks for friend-link discount and charges from VWS.</td>
<td>Service: CCS -&gt; Capability: VOICE_MO or HPLMN MO Control plan configured in Product Type for this Capability.</td>
</tr>
<tr>
<td>SNST_VOICE_NONCMX</td>
<td>Control plan for handling MO Voice calls from unknown subscribers (no CCS account) Simply sends back a Continue operation</td>
<td>Service: CCS -&gt; Capability: VOICE_MO or HPLMN MO Default control plan in Capability.</td>
</tr>
<tr>
<td>SNST_VOICE_CALL_BACK</td>
<td>Handles B-leg for Click2Call service. Triggered after handover by Call Initiation Node in Click2Call BPL Control Plan. Attempts to connect the call and charge from VWS.</td>
<td>Service: SNST_VOICE_CALL_BACK -&gt; Capability: SNST_VOICE_CALL_BACK Control plan configured in Product Type for this Capability.</td>
</tr>
<tr>
<td>Control Plan Name</td>
<td>Description</td>
<td>Triggered by</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>SNST_SMS_KEYWORD</strong></td>
<td>Main control plan for SMS Self-Care. Analyzes the SMS user data and compares with all known SNST keywords. Then executes the appropriate sub control plan.</td>
<td>Service: CCS_SM_MO + CdPN = Self-care shortcode -&gt; Capability: SNST Short-Code Control plan configured in Product Type for this Capability.</td>
</tr>
<tr>
<td><strong>SNST_SMS_KEYWORD_NONCMX</strong></td>
<td>Main control plan for SMS Self-Care for SMS messages from unknown subscribers (no CCS account). Analyzes the SMS user data and compares with all known SNST keywords. Then executes the appropriate sub control plan.</td>
<td>Service: CCS_SM_MO + CdPN = Self-care shortcode -&gt; Capability: SNST Short-Code Default Control Plan in Capability.</td>
</tr>
</tbody>
</table>

**BPL control plans**

This table describes the predefined BPL control plans.

<table>
<thead>
<tr>
<th>Control Plan Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BPL_SNST_ADD</strong></td>
<td>Expects a parameter in BPL EXT3 with one or more MSISDNs to be added as Friends for the triggered subscriber. Executes the SUB_SNST_ADD_FRIEND sub control plan for each target friend MSISDN.</td>
</tr>
<tr>
<td><strong>BPL_SNST_ADD_BEST_FRIEND</strong></td>
<td>Expects a parameter in BPL EXT3 with one MSISDN. Adds the MSISDN to the Best Friend list of the triggered subscriber.</td>
</tr>
<tr>
<td><strong>BPL_SNST_BUNDLE</strong></td>
<td>Expects a parameter in BPL EXT3 with the name of a Service Bundle. Executes the SUB_SNST_KEYWORD_BUNDLE sub control plan.</td>
</tr>
<tr>
<td><strong>BPL_SNST_CLICK_TO_CALL</strong></td>
<td>Expects a parameter in BPL EXT3 with the MSISDN of the party to call (B-number). Runs the Call Initiation node to issue a callback to the triggering subscriber, then hands over to the SNST_VOICE_CALL_BACK control plan.</td>
</tr>
<tr>
<td><strong>BPL_SNST_DEACTIVATE</strong></td>
<td>Executes the SUB_SNST_KEYWORD_STOP sub control plan.</td>
</tr>
</tbody>
</table>
| **BPL_SNST_IAR** | This Control Plan is triggered by BPL from within the ADD and REMOVE sub control plans. It will:  
  - Check which Influential Atom Reward PC should be subscribed to  
  - Apply (un)subscriptions as required  
Where:  
  - MSISDN = Account Reference Profile = Subscriber B (has been added by A).  
  - EXT3 = The number of entries in the Received List. If this field is empty, it will recount the Received List. |
| **BPL_SNST_INVITE** | Expects a parameter in BPL EXT3 with the MSISDN to |
which an invite from the triggered subscriber should be sent to.
Runs the SUB_SNST_KEYWORD_INVITE sub control plan.

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
</table>
| **BPL_SNST_NUMBER_CHANGE**      | Expects a parameter in BPL EXT3 with the new MSISDN of the subscriber. The old MSISDN is the triggered subscriber. Loops through Received List, and for each Received Friend:  
  - Loads his profile  
  - Checks if MSISDN is o the On-net or Off-net Added list  
  - Deletes old MSISDN from list using DAP or PI  
  - Adds new MSISDN to list using DAP or PI  
  - Sends notification SMS to this Friend  

Loops through On-net and Off-net Added lists, and for each friend:  
- Loads his profile  
- Deletes old MSISDN from Received list using DAP or PI  
- Adds new MSISDN to Received list using DAP or PI  
- Sends notification SMS to this Friend  
Changes the subscriber’s own old MSISDN to the new MSISDN. |
| **BPL_SNST_PORT_IN**            | Executes Port-In logic for the triggered subscriber. For example:  
  - Best Friend Logic  
  - Empathy Atom Reward  
  - Move this subscriber from Off-net Added to On-net Added for all his Received Friends |
| **BPL_SNST_PORT_OUT**           | Executes Port-Out logic for the triggered subscriber. For example:  
  - Risk Reward logic  
  - Unsubscribe from all Reward periodic charges  
  - Move this subscriber from On-Net Added to Off-Net Added for all his Received Friends |
| **BPL_SNST_REGISTER**           | Executes the SUB_SNST_REGISTRATION or SUB_SNST_REGISTRATION_NONCMX (depending on whether the subscriber already has a CCS account) |
| **BPL_SNST_REMOVE**             | Expects a parameter in BPL EXT3 with one MSISDN, to be removed as Friend for the triggered subscriber. Executes the SUB_SNST_KEYWORD_REMOVE sub control plan. |
| **BPL_SNST_STATUS**             | Executes the SUB_SNST_CHECK_STATUS sub control plan and returns a response code based on the subscriber SNST status and Off-net flag. The response code is mapped to a response string by the BPL response mappings. |
**OSD control plans**

This table describes the predefined OSD control plans.

<table>
<thead>
<tr>
<th>Control Plan Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSD_SNST_ADD</td>
<td>Executes the SUB_SNST_ADD_FRIEND sub control plan for each target friend MSISDN.</td>
</tr>
<tr>
<td>OSD_SNST_BUNDLE</td>
<td>Executes the SUB_SNST_KEYWORD_BUNDLE sub control plan.</td>
</tr>
<tr>
<td>OSD_SNST_CLICK_TO_CALL</td>
<td>Runs the Call Initiation node to issue a callback to the triggering subscriber, then hands over to the SNST_VOICE_CALL_BACK control plan.</td>
</tr>
<tr>
<td>OSD_SNST_CLICK_TO_SMS</td>
<td>Sends a SMS message to a target Friend MSISDN.</td>
</tr>
<tr>
<td>OSD_SNST_DEACTIVATE</td>
<td>Executes the SUB_SNST_KEYWORD_STOP sub control plan.</td>
</tr>
<tr>
<td>OSD_SNST_INVITE</td>
<td>Sends an invite from the triggered subscriber to a target MSISDN.</td>
</tr>
<tr>
<td></td>
<td>Runs the SUB_SNST_KEYWORD_INVITE sub control plan.</td>
</tr>
<tr>
<td>OSD_SNST_NOMINATE</td>
<td>Nominates an on-net subscriber as a Best Friend.</td>
</tr>
<tr>
<td></td>
<td>Runs the SUB_SNST_KEYWORD_NOMINATE sub control plan.</td>
</tr>
<tr>
<td>OSD_SNST_QUERY_FRIEND</td>
<td>Returns the Added and Received Friend Lists of the subscriber.</td>
</tr>
<tr>
<td>OSD_SNST_QUERY_FRIEND_SIZE</td>
<td>Returns the sizes of the Added and Received Friend Lists of the subscriber.</td>
</tr>
<tr>
<td>OSD_SNST_REGISTER</td>
<td>Executes the SUB_SNST_REGISTRATION or SUB_SNST_REGISTRATION_NONCMX (depending on whether the subscriber already has a CCS account.</td>
</tr>
<tr>
<td>OSD_SNST_REMOVE</td>
<td>Removes a Friend from the Friends Lists of the triggered subscriber.</td>
</tr>
<tr>
<td></td>
<td>Executes the SUB_SNST_KEYWORD_REMOVE sub control plan.</td>
</tr>
<tr>
<td>OSD_SNST_REFERRAL_REWARD</td>
<td>Applies a Voucher Type Recharge for the Referral Reward.</td>
</tr>
<tr>
<td></td>
<td>Triggered from the BPL_SNST_PORT_IN control plan.</td>
</tr>
<tr>
<td>OSD_SNST_STATUS</td>
<td>Executes the SUB_SNST_CHECK_STATUS sub control plan and returns a response code based on the subscriber SNST status and off-net flag.</td>
</tr>
</tbody>
</table>

**Sub control plans**

Unless otherwise specified, these are never triggered directly. Instead, they are run by Service, OSD and BPL control plans using the sub control plan feature node.

<table>
<thead>
<tr>
<th>Control Plan Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB_SNST_ADD_FRIEND</td>
<td>Attempts to add a new friend to the correct friend list of the triggered subscriber. It will:</td>
</tr>
<tr>
<td></td>
<td>• Check any limitations are not</td>
</tr>
</tbody>
</table>
exceeded and the friend MSISDN is valid.
- Determine if the friend is Off-net or On-net.
- Optionally create a new CCS account for the friend.
- Update the correct friend list for both the triggered subscriber account, and the friend account.

<table>
<thead>
<tr>
<th>SUB_SNST_BPL_SETUP</th>
<th>Run all BPL control plans for generic actions such as setting BPL HOST and USER values in BE CDR tags.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB_SNST_CHECK_BPL_EC</td>
<td>Run by most BPL control plans. Inspects the 'SNST BPL Error' tag in the Temporary profile block, which can be set by multiple BPL or sub control plans, or both. Applies a Disconnect with the corresponding Release Cause (which will be mapped by BPL Response Mappings).</td>
</tr>
<tr>
<td>SUB_SNST_CHECK_STATUS</td>
<td>Run by almost all control plans except BPL control plans. Checks the SNST Service Status and number of friends of the subscriber, and takes one of multiple exits based on the result.</td>
</tr>
<tr>
<td>SUB_SNST_FIND_FRIEND</td>
<td>Looks up the CC Pending TN in all three possible friend lists of the subscriber and copies the number to the 'SNST Friend Entry' profile in the Temporary block, if found. Exits are based on which list the number was found in, or if the number was not found.</td>
</tr>
<tr>
<td>SUB_SNST_KEYWORD_BUNDLE</td>
<td>Attempts to recharge the subscriber with the Service Bundle (Voucher Type) indicated by the SMS user data. Attempts to charge the Subscriber for the purchased Service Bundle.</td>
</tr>
<tr>
<td>SUB_SNST_KEYWORD_INVITE</td>
<td>Builds a customized 'invitation' SMS that will be sent to the target B-number as if it was sent by the A-number (=triggered subscriber). Checks that the B-number is actually Off-net and appears on the Off-net Added list of the triggered subscriber. Checks that this particular invitation has not been sent previously.</td>
</tr>
<tr>
<td>SUB_SNST_KEYWORD_NOMINATE</td>
<td>Adds the target B-number to the Best Friend List of the triggered Off-net subscriber, and vice versa. Checks subscriber is eligible for Best Friend nomination (On-net and has sent invitation to triggered subscriber previously).</td>
</tr>
<tr>
<td>SUB_SNST_KEYWORD_QUERY</td>
<td>Determines the type of friend query (Added friends, All friends, specific MSISDN), looks up the numbers from the triggered subscriber’s friend lists. Then builds a customized response SMS with all MSISDNs of the friends.</td>
</tr>
<tr>
<td>Keyword Analysis</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SUB_SNST_KEYWORD_REMOVE</td>
<td>Attempts to remove an existing friend from the correct friend list of the triggered subscriber. It will:</td>
</tr>
<tr>
<td></td>
<td>- Look up the friend across all friend lists</td>
</tr>
<tr>
<td></td>
<td>- Remove the friend from the subscriber’s friend list, and vice versa.</td>
</tr>
<tr>
<td></td>
<td>- Apply Pressured Atom Reward logic.</td>
</tr>
<tr>
<td></td>
<td>- Apply Influential Atom Reward logic.</td>
</tr>
<tr>
<td>SUB_SNST_KEYWORD_STOP</td>
<td>Changes the SNST Service Status of a subscriber to Deactivated. Unsubscribes the subscribers from all possible Periodic Charges.</td>
</tr>
<tr>
<td>SUB_SNST_KEYWORD_YES</td>
<td>Changes the SNST Service Status of a subscriber to Registered. Charges for the registration and subscribes to a monthly charge.</td>
</tr>
<tr>
<td>SUB_SNST_LOCATION_DETERMINATION</td>
<td>Looks up the IMSI of the CC Calling Logical Number and determines if the subscriber is on- or off-net, by comparing the IMSI with SNST Mobile Network Code Geography Set.</td>
</tr>
<tr>
<td>SUB_SNST_POST_CALL_NOTIFICATION</td>
<td>Sends a post-call notification SMS to the subscriber. Used in the SNST VOICE Service Control Plan after a friend-to-friend call.</td>
</tr>
<tr>
<td>SUB_SNST_REGISTRATION</td>
<td>Sets the current account in a pending Registered state for on-net subscribers and in a Registered state for off-net subscribers. If successful and on-net, sends a confirmation request SMS to the subscriber. Used when the subscriber already has a CCS subscriber account.</td>
</tr>
<tr>
<td>SUB_SNST_REGISTRATION_NONCMX</td>
<td>Sets the current account in a pending Registered state for on-net subscribers and in a Registered state for off-net subscribers. If successful and on-net, sends a confirmation request SMS to the subscriber. Used when the subscriber does not have a CCS subscriber account yet.</td>
</tr>
</tbody>
</table>

**Detailed Control Plan Logic**

**Introduction**

This topic provides a detailed review of some of the SNST control plans.

**Note:** All SNST control plans include detailed comments in Note feature nodes within the control plan.

**Keyword analysis**

The SNST_SMS_KEYWORD control plan and the SNST_SMS_KEYWORD_NONCMX control plan follow the same high-level logic. Keywords are allowed based on the following criteria:
The subscriber must exist. If the subscriber does not exist, then the SNST_SMS_KEYWORD_NONCMX control plan will be triggered, allowing the subscriber to Register only.

- The SNST Status of a subscriber
- The On or Off-net Status of a subscriber

**Keyword logic**

This diagram shows the high level logic used in the SNST_SMS_KEYWORD and the SNST_SMS_KEYWORD_NONCMX control plans.
General keyword analysis

This procedure explains how keywords used in SNST control plans are analyzed.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1     | The Format Text feature node (FN) is used to create an expression of each keyword by:  
|       | - Retrieving the configurable keyword string from the CCS Global Profile.  
|       | - Prefixing this string with "^".  
|       | - Storing the resulting string in the Temporary Storage block. |
| 2     | Once a number of expressions have been formed, the Text Branching FN is used to test whether the SMS User Data contains any of the formed expressions. All keywords are tested until a match is found.  
|       | In case of:  
|       | - Digits. If the SMS User Data contains only digits it is treated as an Add Friend Request.  
|       | - VCARD. If the SMS User Data contains the string ‘vcard’ it is treated as a VCARD Add Friend Request. |
| 3     | If no match is found and the SMS User Data is not empty then a configurable error notification will be sent to the SNST user. |

Check keyword logic diagram

Here is an example diagram showing logic used for the main check keyword analysis.

SNST_SMS_Keyword Control Plan

SNST_SMS_KEYWORD control plan

The SNST_SMS_KEYWORD control plan applies special logic for a self-care SMS for:
• A forwarded add friend notification to deny the friend link.
• A forwarded add Off-net friend notification to invite an Off-net friend to the network.
• A forwarded invite notification to nominate an on-net subscriber as Best Friend.

When a registered subscriber is added as a friend by another subscriber, they will receive the "SNST Add Notif B Suc (Reg)" notification. They can forward this notification back to the SNST short-code to deny (remove) the friend link.

Because the notification text is configurable and language dependent, the following special logic is required to recognize the forwarded notification SMS:

• First, the Extract Content FN is used to store the SMS payload temporarily in a profile tag, called "SNST Error". The profile tag provides a reusable buffer in which to store the incoming SMS message.

• Then the Format Text FN and Keyword Search and Replace FN are used to load the default notification text from the configured ACS template notification into the SMS payload buffer and replace all variable parts with ".*". This creates a regular expression that will match the forwarded SMS User Data.

  Example
  "Hi. You have received my number into your friend network & you now receive a friend discount when calling me. I also receive a friend discount when calling you. To reject this request, forward this SMS or send .* .* to .\n"

• Finally the regular expression from the SMS payload buffer is moved to a temporary buffer and the previously stored original message from the "SNST error" buffer is moved back into the SMS payload buffer. The Text Content Branching FN must try to match the content of the SMS payload with the regular expression stored in the Temporary buffer.

**Note:** The control plans for Off-net Friend invitation and the Best Friend nomination function in the same way.

**Default notification text**

The default notification text defined in the ACS template notification configuration is:

"Hi. You have received my number into your friend network & you now receive a friend discount when calling me. I also receive a friend discount when calling you. To reject this request, forward this SMS or send <<16>> <<17>> to <<18>>"

**Example output**

"Hi. You have received my number into your friend network & you now receive a friend discount when calling me. I also receive a friend discount when calling you. To reject this request, forward this SMS or send REMOVE 0123456789 to 777"
SNST_SMS_Keyword logic

Here is an example of the SMS forwarding logic used by the SNST_SMS_KEYWORD control plan.

Registration Sub Control Plan

Introduction

The SUB_SNST_REGISTRATION sub control plan is executed when an existing subscriber sends the REGISTRATION keyword to the SNST short code self-care number.

Registration sub control plan processing

This topic describes the SUB_SNST_REGISTRATION sub control plan processing.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>An existing subscriber sends the REGISTER keyword.</td>
</tr>
<tr>
<td>2</td>
<td>Check whether the subscriber is Deactivated, Unregistered (Off-net or On-net) or Registered (Off-net or On-net).</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Because sub control plans cannot be used within sub control plans, this logic in the control plan is a copy of the SUB_SNST_CHECK_STATUS control plan.</td>
</tr>
<tr>
<td>3</td>
<td>For Deactivated subscribers and subscribers whose status has not been ascertained (Unknown), determine whether they are On-net or Off-net.</td>
</tr>
<tr>
<td>Stage</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>4</td>
<td>Depending on the determined status, do one of the following:</td>
</tr>
<tr>
<td></td>
<td>- Change status of Off-net Subscribers directly to Registered without confirmation.</td>
</tr>
<tr>
<td></td>
<td>- Change status of On-net subscribers to Unregistered with the Pending Registration flag set. Determine the cost of registration for On-net subscribers and send this to the subscriber in a notification message. The subscriber can confirm registration using the 'YES' keyword.</td>
</tr>
<tr>
<td></td>
<td>- Send &quot;Already Registered&quot; notification message to subscribers that are already registered.</td>
</tr>
</tbody>
</table>

**Registration sub control plan logic**

Here is an example of the SUB_SNST_CHECK_STATUS sub control plan logic used in the SUB_SNST_REGISTRATION sub control plan.

![Diagram showing the logic used depending on subscriber status.](image)

Here is a diagram showing the logic used depending on subscriber status.
Overview

Introduction

This chapter explains how to improve the performance of Oracle Communications Network Charging and Control (NCC) Social Networking Service Template (SNST) by increasing the internal throughput of the SOAP requests sent from the Service Logic Controller (SLC) to the Service Management System (SMS).

This chapter contains the following topics.

- Performance Tuning Configuration Overview
- DAP Configuration for Load Balancing
- PI Configuration for Load Balancing
- Apache and Mod Proxy Balancer Configuration

Performance Tuning Configuration Overview

Load balancing self-care updates

SNST subscriber profile changes, such as adding a new entry on a friend list, or updating the service status, are typically initiated from the SLC nodes following a self-care SMS, or an OSD request.

The SLC sends update requests to the SMS by using a SOAP request sent from a dapRequest node and dapInterface on the SLC to a PI SOAP port on the SMS.

The achievable throughput of SOAP requests is constrained by the throughput of the single PI port process. However, you can significantly increase this throughput by load balancing the SOAP requests from the SLC nodes across multiple PI ports.

This section explains how to achieve load balancing of SOAP requests by configuring the NCC application, and using Apache with the mod_proxy_balancer. When you configure NCC as described in this section, DAP requests from the SLC nodes will be directed to the Apache instance on the SMS node, and load-balanced across multiple PI ports.
Load balancing configuration example
Here is an example diagram showing how to configure NCC to achieve load balancing of SOAP requests.

DAP Configuration for Load Balancing

DAP operation configuration
All requests from DAP to PI must be in SOAP format, with implicit login. To ensure all DAP requests to the PI are in the correct format, you should review the following configuration:

- Review all occurrences of DAP Request nodes in all relevant control plans, and take note of the configured DAP operation.
- Review the XML template of each noted DAP operation and ensure it specifies the PI command in PI SOAP format with implicit login.

Example
Here is an example PI command using PI SOAP format with implicit login.

```xml
<pi:CCSCD9_CHG>
  <pi:username>dap</pi:username>
  <pi:password>dap</pi:password>
  <pi:MSISDN>$$MSISDN$$</pi:MSISDN>
  <pi:TAG>Language</pi:TAG>
  <pi:VALUE>2</pi:VALUE>
</pi:CCSCD9_CHG>
```

Where:
- `username` is the login id used in the implicit login.
- `password` in the password for the login id.
DAP ASP configuration

All DAP operations must use the same DAP ASP. You should use the following configuration for the DAP ASP:

- **Destination URL**: http://sms_hostname:port_number/
  - Where:
    - `sms_hostname` should be replaced by the hostname or IP address of the SMS node.
    - `port_number` should be replaced by an unused port on the SMS. This port will be used for Apache.
- **Protocol**: SOAP
- **Connection**: HTTP

DAP interface configuration

Ensure that no additional overhead is caused from re-establishing TCP/IP connections by configuring the DAP Interfaces on the SLC to use persistent connections.

To configure persistent connections for DAP interfaces, set the following configuration items in the `eserv.config` file on the SLC nodes:

- `DAP.persistentConnections = true`
- `DAP.persistentConnectionCheckTimeout = 30`

PI Configuration for Load Balancing

PI SOAP configuration

On the SMS, configure the PI to accept implicit SOAP logins and ignore PI authentication strings.

To configure the PI to accept implicit SOAP logins, set the following parameters in the `eserv.config` file on the SMS:

- `pi.soap.implicitLoginsSupported = true`
- `pi.soap.validateAuthStrings = false`

Configuring PI ports for load balancing

Follow these steps to configure multiple PI ports to load-balance across.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In the SMS UI, select <strong>Provisioning-&gt;Administration</strong> from the <strong>Services</strong> menu.</td>
</tr>
<tr>
<td>2</td>
<td>On the <strong>Ports</strong> tab, create a new range of PI ports that will be used for load balancing. For example, create 10 ports numbered 9001 through 9010. Specify the following configuration for each port:</td>
</tr>
<tr>
<td></td>
<td><strong>Parameter</strong></td>
</tr>
<tr>
<td></td>
<td>Secure</td>
</tr>
<tr>
<td></td>
<td>Max Connections</td>
</tr>
<tr>
<td></td>
<td>Type</td>
</tr>
<tr>
<td>3</td>
<td>To activate the new ports, restart the PImanager by logging on to the SMS as user <code>smf_oper</code> and entering the command: <code>pkill PImanager</code></td>
</tr>
</tbody>
</table>
Apache and Mod Proxy Balancer Configuration

About Apache mod proxy balancer

You must have installed Apache version 2.1 or higher on the SMS node to be able to use the mod_proxy_balancer module.

Note: Apache v2.1 or higher is not installed by default in Solaris 10 u9. If it is not installed already, you should install it on the SMS node.

To install Apache v2.1 or higher, follow the download and installation instructions on the Apache website:

http://httpd.apache.org/

httpd.conf configuration

This table describes the minimum configuration that you should define in the $PREFIX/conf/httpd.conf file. Where $PREFIX refers to the location where Apache has been installed, for example: /usr/local/apache2.

Note: This guide assumes you are using Apache 2.2.17.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KeepAliveTimeout 31</td>
<td>Set this parameter to be one second longer than the value configured for: DAP.persistentConnectionCheckTimeout. This will ensure that DAP detects a connection closed by Apache after expiry of this timer. <strong>Warning:</strong> You should dedicate this Apache instance for load balancing DAP traffic. It should not serve any other use. In particular, do not use this setting for serving high volumes of web pages.</td>
</tr>
<tr>
<td>MaxKeepAliveRequests 0</td>
<td>Set the default amount from 100 to 0 (unlimited) to ensure apache never drops the connection with dapIF.</td>
</tr>
<tr>
<td>Listen 9000 or Listen 10.10.0.2:9000</td>
<td>Configure the TCP port on which Apache will be listening for connections from the DAP Interfaces on the SLCs. You should replace 9000 with the port previously specified for DAP ASP configuration (on page 123). If the SMS node has multiple network interfaces or IP addresses, or both, this parameter can be used to limit the IP addresses that will be used. In this case replace 10.10.0.2 with the desired local IP address.</td>
</tr>
<tr>
<td>LoadModule proxy_balancer_module modules/mod_proxy_balancer.so</td>
<td>Ensure the mod_proxy_balancer is loaded</td>
</tr>
<tr>
<td>Include conf/extra/httpd-proxy-balancer.conf</td>
<td>Include external configuration for the mod_proxy_balancer module</td>
</tr>
<tr>
<td>&lt;Location /balancer-manager&gt;</td>
<td>SetHandler balancer-manager Order Deny,Allow Deny from all Allow from all</td>
</tr>
</tbody>
</table>
Configuring http-proxy-balancer.conf

Follow these steps to configure the http-proxy-balancer.conf file.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1    | Edit the $PREFIX/conf/extra/httpd-proxy-balancer.conf file to use the following configuration template:  

```
<Proxy balancer://mycluster>
BalancerMember http://localhost:9001 route=1 max=1
BalancerMember http://localhost:9002 route=2 max=1
BalancerMember http://localhost:9003 route=3 max=1
BalancerMember http://localhost:9004 route=4 max=1
BalancerMember http://localhost:9005 route=5 max=1
BalancerMember http://localhost:9006 route=6 max=1
BalancerMember http://localhost:9007 route=7 max=1
BalancerMember http://localhost:9008 route=8 max=1
BalancerMember http://localhost:9009 route=9 max=1
BalancerMember http://localhost:9010 route=10 max=1
</Proxy>
ProxyPass /piBalancer balancer://mycluster |
| 2    | Replace the template port numbers 9001-9010 with the port numbers previously chosen for the PI ports. Add one entry for each PI port. |
| 3    | Use the max=1 directive to limit the number of TCP/IP connections Apache will open towards the PI ports. |

Starting Apache

To start Apache, log in to the SMS as user root and enter the following command:

```
$PREFIX/bin/apachectl start
```

Ensure this Apache instance is automatically started after a reboot and stopped on shutdown, by creating the required startup scripts in the following files:

- /etc/init.d
- /etc/rc2.d
- /etc/rc3.d
NCC Glossary of Terms

ACS
Advanced Control Services configuration platform.

ASP
- Application Service Provider, or

BE
Billing Engine

CAMEL
Customized Applications for Mobile network Enhanced Logic
This is a 3GPP (Third Generation Partnership Project) initiative to extend traditional IN services found in fixed networks into mobile networks. The architecture is similar to that of traditional IN, in that the control functions and switching functions are remote. Unlike the fixed IN environment, in mobile networks the subscriber may roam into another PLMN (Public Land Mobile Network), consequently the controlling function must interact with a switching function in a foreign network. CAMEL specifies the agreed information flows that may be passed between these networks.

CAP
CAMEL Application Part

CC
Country Code. Prefix identifying the country for a numeric international address.

CCS
1) Charging Control Services (or Prepaid Charging) component.
2) Common Channel Signalling. A signalling system used in telephone networks that separates signalling information from user data.

CDR
Call Data Record
Note: The industry standard for CDR is EDR (Event Detail Record). Over time EDR will replace CDR in the Oracle documentation.

Connection
Transport level link between two peers, providing for multiple sessions.

CS1
ETSI INAP Capability Set 1. An ITU standard.
DAP
Data Access Pack. An extension module for ACS which allows control plans to make asynchronous requests to external systems over various protocols including XML and LDAP.

DB
Database

Diameter
A feature rich AAA protocol. Utilises SCTP and TCP transports.

DP
Detection Point

DTMF
Dual Tone Multi-Frequency - system used by touch tone telephones where one high and one low frequency, or tone, is assigned to each touch tone button on the phone.

EDR
Event Detail Record

Note: Previously CDR. The industry standard for CDR is EDR (Event Detail Record). Over time EDR will replace CDR in the NCC documentation.

EMI
Exchange Message Interface protocol

ETSI
European Telecommunications Standards Institute

FDA
First Delivery Attempt - the delivery of a short message directly to the SME rather than relaying it through the MC.

GMSC
Gateway MSC. The first MSC which handles a call. For a MOC, this is the caller’s attached MSC. For an MTC, this is the first non-transit MSC in the subscriber’s network that receives the inbound call.

GPRS
General Packet Radio Service - employed to connect mobile cellular users to PDN (Public Data Network- for example the Internet).

GSM
Global System for Mobile communication.
It is a second generation cellular telecommunication system. Unlike first generation systems, GSM is digital and thus introduced greater enhancements such as security, capacity, quality and the ability to support integrated services.

**GUI**

Graphical User Interface

**HLR**

The Home Location Register is a database within the HPLMN (Home Public Land Mobile Network). It provides routing information for MT calls and SMS. It is also responsible for the maintenance of user subscription information. This is distributed to the relevant VLR, or SGSN (Serving GPRS Support Node) through the attach process and mobility management procedures such as Location Area and Routing Area updates.

**HPLMN**

Home PLMN

**HTML**

HyperText Markup Language, a small application of SGML used on the World Wide Web. It defines a very simple class of report-style documents, with section headings, paragraphs, lists, tables, and illustrations, with a few informational and presentational items, and some hypertext and multimedia.

**IDP**

INAP message: Initial DP (Initial Detection Point)

**IMSI**

International Mobile Subscriber Identifier. A unique identifier allocated to each mobile subscriber in a GSM and UMTS network. It consists of a MCC (Mobile Country Code), a MNC (Mobile Network Code) and a MSIN (Mobile Station Identification Number).

The IMSI is returned by the HLR query (SRI-SM) when doing FDA. This tells the MSC exactly who the subscriber is that the message is to be sent to.

**IN**

Intelligent Network

**INAP**

Intelligent Network Application Part - a protocol offering real time communication between IN elements.

**Initial DP**

Initial Detection Point - INAP Operation. This is the operation that is sent when the switch reaches a trigger detection point.

**IP**

1) Internet Protocol

2) Intelligent Peripheral - This is a node in an Intelligent Network containing a Specialized Resource Function (SRF).
IP address
Internet Protocol Address - network address of a card on a computer

ISDN
Integrated Services Digital Network - set of protocols for connecting ISDN stations.

ISUP
ISDN User Part - part of the SS7 protocol layer and used in the setting up, management, and release of trunks that carry voice and data between calling and called parties.

ITU
International Telecommunication Union

IVR
Interactive Voice Response - systems that provide information in the form of recorded messages over telephone lines in response to user input in the form of spoken words or, more commonly, DTMF signalling.

LCP
Location Capabilities Pack - set of software components used by other applications to look up the location of mobile devices.

M3UA
MTP3 User Adaptation. The equivalent of MTP in the SIGTRAN suite.

MAP
Mobile Application Part - a protocol which enables real time communication between nodes in a mobile cellular network. A typical usage of the protocol would be for the transfer of location information from the VLR to the HLR.

MC
Message Centre. Also known as SMSC.

MCC
Mobile Country Code. In the location information context, this is padded to three digits with leading zeros. Refer to ITU E.212 ("Land Mobile Numbering Plan") documentation for a list of codes.

Messaging Manager
The Messaging Manager service and the Short Message Service components of Oracle Communications Network Charging and Control product. Component acronym is MM (formerly MMX).

MM
Messaging Manager. Formerly MMX, see also XMS (on page 135) and Messaging Manager (on page 130).
**MNC**
Mobile Network Code. The part of an international address following the mobile country code (MCC), or at the start of a national format address. This specifies the mobile network code, that is, the operator owning the address. In the location information context, this is padded to two digits with a leading zero. Refer to ITU E.212 ("Land Mobile Numbering Plan") documentation for a list of codes.

**MNP**
Mobile Number Portability

**MO**
Mobile Originated

**MOC**
Managed Object Class

**MS**
Mobile Station

**MSC**
Mobile Switching Centre. Also known as a switch.

**MSIN**
Mobile Station Identification Number.

**MSISDN**
Mobile Station ISDN number. Uniquely defines the mobile station as an ISDN terminal. It consists of three parts; the country code (CC), the national destination code (NDC) and the subscriber number (SN).

**MT**
Mobile Terminated

**MTC**
Mobile Terminated Call. The part of the call associated with a subscriber receiving an inbound call.

**MTP**
Message Transfer Part (part of the SS7 protocol stack).

**MTP3**
Message Transfer Part - Level 3.

**NOA**
Nature Of Address - a classification to determine in what realm (Local, National or International) a given phone number resides, for the purposes of routing and billing.
Oracle
Oracle Corporation

**PACUI**
Play Announcement and Collect User Information

**PC**
Point Code. The Point Code is the address of a switching point.

**Peer**
Remote machine, which for our purposes is capable of acting as a Diameter agent.

**PI**
Provisioning Interface - used for bulk database updates/configuration instead of GUI based configuration.

**PLMN**
Public Land Mobile Network

**SCCP**
Signalling Connection Control Part (part of the SS7 protocol stack).

**SCTP**
Stream Control Transmission Protocol. A transport-layer protocol analogous to the TCP or User Datagram Protocol (UDP). SCTP provides some similar services as TCP (reliable, in-sequence transport of messages with congestion control) but adds high availability.

**Service Provider**
See Telco.

**SGML**

**SGSN**
Serving GPRS Support Node

**SLC**
Service Logic Controller (formerly UAS).

**SLEE**
Service Logic Execution Environment
SME
Short Message Entity - an entity which may send or receive Short Messages. It may be located in a fixed network, a mobile, or an SMSC.

SMPP
Short Message Peer-to-Peer protocol

SMS
Depending on context, can be:
- Short Message Service
- Service Management System platform
- NCC Service Management System application

SMSC
Short Message Service Centre - stores and forwards a short message to the indicated destination subscriber number.

SN
Service Number

SNMP

SOAP

SRF
Specialized Resource Function - This is a node on an IN which can connect to both the SSP and the SLC and delivers additional special resources into the call, mostly related to voice data, for example play voice announcements or collect DTMF tones from the user. Can be present on an SSP or an Intelligent Peripheral (IP).

SRI
Send Routing Information - This process is used on a GSM network to interrogate the HLR for subscriber routing information.

SS7
A Common Channel Signalling system used in many modern telecoms networks that provides a suite of protocols which enables circuit and non circuit related information to be routed about and between networks. The main protocols include MTP, SCCP and ISUP.

SSP
Service Switching Point
SUA
Signalling Connection Control Part User Adaptation Layer

TCAP
Transaction Capabilities Application Part – layer in protocol stack, message protocol.

TCP
Transmission Control Protocol. This is a reliable octet streaming protocol used by the majority of applications on the Internet. It provides a connection-oriented, full-duplex, point to point service between hosts.

Telco
Telecommunications Provider. This is the company that provides the telephone service to customers.

Telecommunications Provider
See Telco.

UCAI
Universal Call Agent ISUP (formerly VSSP)

VLR
Visitor Location Register - contains all subscriber data required for call handling and mobility management for mobile subscribers currently located in the area controlled by the VLR.

Voice Call
The term “voice call” in this document is intended to denote any call controlled by CAMEL or INAP InitialDP. In practice this also includes fax calls, data-over-voice calls, and also includes 3G voice and video conference calls.

VSSP
Virtual SSP - old name for UCAI

VWS
Oracle Voucher and Wallet Server (formerly UBE).

WSDL
Web Services Description Language.

XML
eXtensible Markup Language. It is designed to improve the functionality of the Web by providing more flexible and adaptable information identification.

It is called extensible because it is not a fixed format like HTML. XML is a `metalanguage' — a language for describing other languages—which lets you design your own customized markup languages for limitless different types of documents. XML can do this because it's written in SGML.
XMS

Three letter code used to designate some components and path locations used by the Oracle Communications Network Charging and Control Messaging Manager (on page 130) service and the Short Message Service. The published code is MM (on page 130) (formerly MMX).
Index

A
About Apache mod proxy balancer • 128
About best phone friend referral • 52
About Click 2 Call • 59
About CLick 2 SMS • 60
About empathy joining reward • 54
About high risk rewards • 57
About influential atom rewards • 55
About IVR • 15, 61
About joining the network • 51
About phone friend lists • 29
About pressured atom rewards • 56
About service bundles • 47
About SMS services • 44
About SNST • 1
About SNST Business Intelligence • 101
About SNST control plans • 111
About SNST global configuration • 108
About snstAddFriends • 65
About snstBlock • 67
About snstBundle • 69
About snstClick2Call • 70
About snstClick2SMS • 72
About snstInvite • 73
About snstNominate • 74
About snstQueryFriendList • 76
About snstQueryFriendListSize • 77
About snstRegister • 79
About snstRemoveFriend • 80
About snstStatus • 82
About the Web Portal • 63
About This Document • vii
About user profiles • 89
About voice services • 43
About WSDL • 64
About WSDL message parameters • 83
Accessing SNST product type configuration • 95
Accessing SNST subscriber details • 91
Account creation parameters • 109
Acquisition Schemes • 51
ACS • 131
Additional subscriber profile tags • 104
Administrator • 90
Alarms • 7
Alarms, Statistics, Reports and EDRs • 7
Announcements • 62
Apache and Mod Proxy Balancer Configuration • 128
ASP • 131
Audience • vii
Awarding bundle reward • 56, 57

B
BE • 131
Best Phone Friend Referral Atom • 39, 52
BPL control plans • 112

C
Call setup • 59
CAMEL • 131
CAP • 131
CC • 131
CC_Calling_Party_Id • 66, 67, 69, 70, 72, 73, 75, 76, 78, 79, 81, 82, 83
CCS • 131
Ccs_Service statistics • 8
CDR • 131
Charging • 60
Check keyword logic diagram • 120
Click 2 Call • 59
Click 2 Call request • 59
Click 2 Call/Click 2 SMS • 59
Click 2 SMS • 60
Click 2 SMS request • 60
Configuring http-proxy-balancer.conf • 129
Configuring keywords • 22, 49
Configuring PI ports for load balancing • 127
Connection • 131
Copyright • ii
Creating phone friends using sms • 29
CS1 • 131
CSR • 89

D
DAP • 132
DAP ASP configuration • 127, 128
DAP Configuration for Load Balancing • 126
DAP interface configuration • 127
DAP operation configuration • 126
DB • 132
Deactivate SNST process • 23, 27
Deactivated state • 20
Default notification text • 121
Detailed Control Plan Logic • 118
Diameter • 132
Discount configuration tags • 106
Document Conventions • viii
Double registration attempt • 26
Downstream impact • 3, 4, 5, 6
DP • 132
DTMF • 132

E
Edit Subscriber Screen for SNST Subscribers • 91
Editing parameter values • 110
EDR • 132
EDRs • 9, 49
Logic trigger • 39

M

M3UA • 134
MAP • 134
MC • 134
MCC • 134
Messaging Manager • 134, 139
MM • 134, 139
MNC • 135
MNP • 135
MO • 135
MO_FWD_SM • 45
MOC • 135
MS • 135
MSC • 135
MSIN • 135
MSISDN • 135
MT • 135
MTC • 135
MTP • 135
MTP3 • 135

N

NCC nodes • 103
Network interfaces • 12
No SNST/No Phone Friends • 46
NOA • 135
Nominate request • 23, 52
Nominate request actions • 53
Nominate request verification • 53
Nomination by forwarding the invitation • 52
Note on reports • 110
Notification message length and text • 40
Notification SMS • 40
Notification SMS configuration • 41
Notification SMS delivery paths • 40
Notification SMS messages • 16
Number Change • 39
Number Normalization • 16

O

Off-net threshold and bundle rewards • 56
Operations • 90
Oracle • 136
OSD control plans • 114
Other parameters example • 109
Overview • 1, 11, 19, 43, 47, 51, 55, 59, 61, 63, 89, 91, 101, 103, 125

P

PACUI • 136
PC • 136
Peer • 136
Performance Tuning Configuration Overview • 125
Phone friend count • 62
Phone Friend Link Benefits • 43
Phone Friend Links • 29
Phone friend list • 62
Phone friend list length • 38
Phone Friend Lists • 29
Phone Friend tariff • 46
PI • 136
PI Configuration for Load Balancing • 127
PI SOAP configuration • 127
PLMN • 136
Porting In • 39
Porting In and Out • 39
Porting in logic • 39
Porting out • 40
Porting out logic • 40
Porting-in • 53
Preferred language • 61
Prerequisites • 77
Pressure rewards • 56
Pressured atom • 3
Pressured atom relationships • 4
Pressured Atom Rewards • 4, 56
Product type profile block • 105
Profile tag groups • 105
Purchase service bundle by IVR • 49
Purchase service bundle by PI/XML/ SOAP • 49
Purchase service bundle by SMS • 49
Purchase service bundle by UI • 49
Purchasing service bundles • 23, 48

Q

Query notification SMS • 36, 37
Query Phone Friends • 35
Querying a single Phone Friend • 23, 36
Querying added Phone Friends • 23, 38
Querying all Phone Friends • 23, 37

R

Received entries threshold and bundle rewards • 56
Referral scheme configuration tags • 107
Registered state • 20
Registration process • 22, 23
Registration Sub Control Plan • 122
Registration sub control plan logic • 123
Registration sub control plan processing • 122
Rejecting Phone Friend links • 33
Removing Phone Friend links • 23, 34
Reports • 9
Reregistering SNST service • 28
Result notification SMS • 35
Retention Schemes • 35
Rewards • 3, 4, 5

S

SCCP • 136
snstRemoveFriend • 80
snstRemoveFriendRequest • 81
snstRemoveFriendResult • 81
snstRemoveFriendResult error list • 81
snstStatus • 82
snstStatusRequest • 82
snstStatusResult • 82
snstStatusResult error list • 83
SOAP • 137
SOAP Interface • 15
Social Networking Service Template • 11
Social Networking Service Template
  Configuration • 103
Social Networking Service Template
  Description • 11
Social Networking Service Template UI • 91
Social networking site integration • 6
Social Networking Sites and SNST • 6
SRF • 137
SRI • 137
SS7 • 137
SSP • 137
Starting Apache • 129
Statistics • 8
SUA • 138
Sub control plans • 115
Subscriber accounts • 19
Subscriber states • 19
Subscriber states diagram • 21
Subscriber validation • 59
Subscription status • 104
Success notification SMS messages • 32
System Overview • 1

T
Target atom • 5
Target atom relationships • 6
TCAP • 138
TCP • 138
Telco • 138
Telecommunications Provider • 138
Typographical Conventions • viii

U
UCAI • 138
Unregistered state • 20
User Profiles • 89

V
Verification SMS • 87
Verification SMS template • 88
VLR • 138
Voice and IVR interfaces • 12
Voice Call • 138
Voice call rating • 44
Voice services • 49
Voice Services • 43

VSSP • 138
VWS • 138

W
Web Portal • 6, 15, 49, 63
Web service • 15
What is SNST? • 1
WSDL • 64, 138
WSDL Message Parameters • 83
WSDL operation fault messages • 65, 66, 67, 69, 70, 72, 73, 75, 76, 78, 79, 80, 82
WSDL operations list • 64, 65

X
XML • 138
XMS • 134, 139

XML • 138
XMS • 134, 139