

**Oracle® Communications  
Network Charging and Control**

Configuration User's Guide

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# About This Document

## Scope

The scope of this document includes all information required to give the reader a complete view on how to configure services to ready a freshly installed NCC platform for customer specific configuration.

## Audience

This guide is written primarily for administrators operating the NCC platform. However, the overview sections of the document are useful to anyone requiring an introduction.

## Related Documents

The following documents are related to this document:

- *Installation Guide*
- *System Administrator's Guide*

## Prerequisites

A solid understanding of UNIX and a familiarity with IN concepts are an essential prerequisite for safely using the information contained in this technical guide. Attempting to install, remove, configure or otherwise alter the described system without the appropriate background skills, could cause damage to the system; including temporary or permanent incorrect operation, loss of service, and may render your system beyond recovery.

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.

Formatting Convention	Type of Information
<b>Special Bold</b>	Items you must select, such as names of tabs. Names of database tables and fields.
<i>Italics</i>	Name of a document, chapter, topic or other publication. Emphasis within text.
<b>Button</b>	The name of a button to click or a key to press. <b>Example:</b> To close the window, either click <b>Close</b> , or press <b>Esc</b> .
<b>Key+Key</b>	Key combinations for which the user must press and hold down one key and then press another. <b>Example:</b> <b>Ctrl+P</b> or <b>Alt+F4</b> .
Monospace	Examples of code or standard output.
<b>Monospace Bold</b>	Text that you must enter.
<i>variable</i>	Used to indicate variables or text that should be replaced with an actual value.
<b>menu option &gt; menu option &gt;</b>	Used to indicate the cascading menu option to be selected. <b>Example:</b> <b>Operator Functions &gt; Report Functions</b>
<a href="#">hypertext link</a>	Used to indicate a hypertext link.

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

# Introduction to NCC Configuration

## Overview

### Introduction

This guide is written to give the reader a complete view on how to configure services on a freshly installed Oracle Communications Network Charging and Control (NCC) platform.

It describes the usage and configuration of the different components, and gives a presentation on the service templates delivered with the product. It also provides a walk-through for a custom service creation.

### In this chapter

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This chapter contains the following topics.

Service Management System.....	1
Create a Control Plan .....	6

## Service Management System

### Accessing SMS

Follow these steps to launch Service Management System using Java WebStart. You can use this process to install a shortcut to the SMS on your desktop.

**Note:** To launch GUI applications using Java WebStart, you must ensure that the Web server supports the `jnlp` file type. For more information, see *Setting up the Screens in Service Management System Technical Guide*.

Step	Action
1	<p>Using a Web browser, open the SMS WebStart by using one of the following methods:</p> <ol style="list-style-type: none"> <li>Open the Service Management System default page on the <code>SMS_hostname</code>, then click the WebStart link.</li> <li>Open SMS WebStart directly. The address is in the format: <code>http://SMS_hostname/sms.jnlp</code></li> </ol> <p>Where <code>SMS_hostname</code> is the hostname of the SMS or cluster which is running the SMS application.</p> <p><b>Result:</b> You see the Opening <code>sms.jnlp</code> download screen.</p>
2	<p>Select <b>Open with</b> and click <b>OK</b>.</p> <p><b>Result:</b> The following two windows open:</p> <ol style="list-style-type: none"> <li>The SMS - <code>SMS_hostname</code> window, for example:           <div data-bbox="367 1803 850 1885" data-label="Image"> </div> </li> <li>The SMS Login window.</li> </ol>

Step	Action
------	--------

See *Logging on to SMS* (on page 2).

**Note:** When launching SMS for the first time using WebStart, a shortcut icon is downloaded and displayed on the Desktop.



This enables you to open the SMS GUI directly by double-clicking the shortcut icon. The icon is removed every time you clear the system cache and downloads again when launching SMS through WebStart.

## Logging on to SMS

Follow these steps to log on to SMS.

Step	Action
------	--------

1 On the SMS Login screen:



2 Enter the account details for the default super-user. The:

- User name is `su`.
- Password is usually `ssob` on freshly installed servers.

**Note:** Please take care entering these account details as three incorrect attempts will lock out all other users. You will use your own user account as soon as you have created one. If you manage to lock the `su` account, please see your trainer or technical mentor to show you how to unlock it.

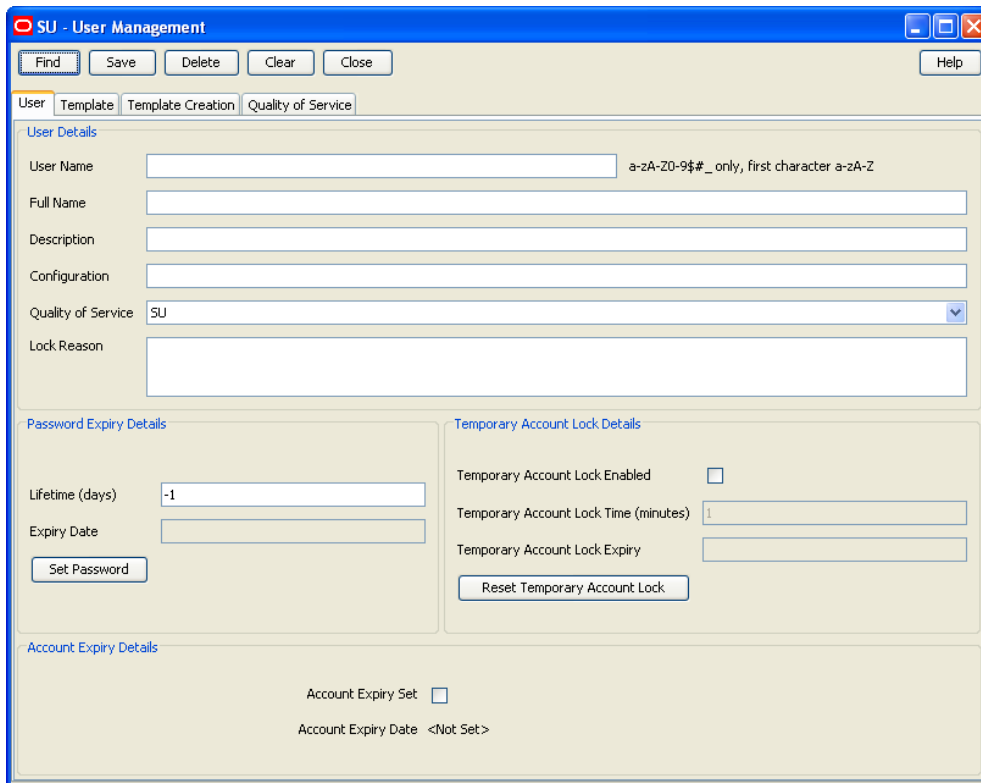


## Adding the SMS user

The system is deployed with an already existing user called `su`. It is best to create a specific user, even with the same rights in order to keep `su` as a backup in case the other login becomes corrupted.

Follow these steps to add the SMS user.

Step	Action
1	Log in to the SMS server as <code>su</code> . See <a href="#">Accessing SMS</a> .
2	Select <b>Operator Functions &gt; User Management</b> . <b>Result:</b> The User Management screen, <b>User</b> tab appears.

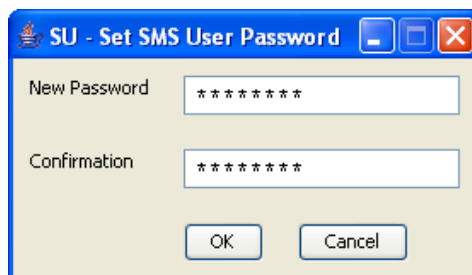


- 3 Enter your details.

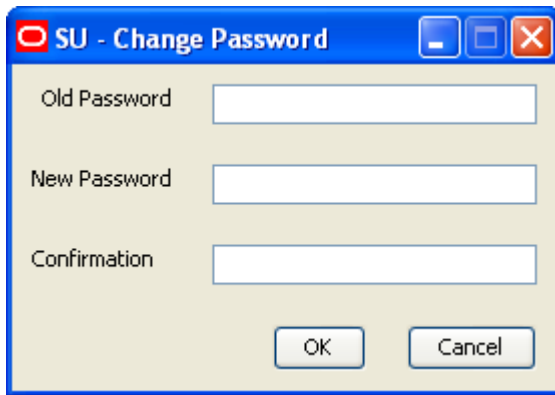
**Note:** The User Name should be in uppercase. You can click **Help** for a description of the fields.

- 4 Click **Set Password**.

**Result:** The Set SMS User Password screen appears.



Step	Action
5	Set the user password. <b>Note:</b> Please do not change passwords for any users not created by you.
6	Click <b>OK</b> .
7	Remember to <b>Save</b> and then <b>Close</b> .
8	Close the browser to log out of SMS. When you logout of SMS, you will find you can no longer log in as another user without restarting the browser and re-accessing SMS.
9	Now log in to SMS using your new user.
10	If you set the lifetime of your password to 0 days, or if the lifetime has expired, you will immediately be prompted to change your password.

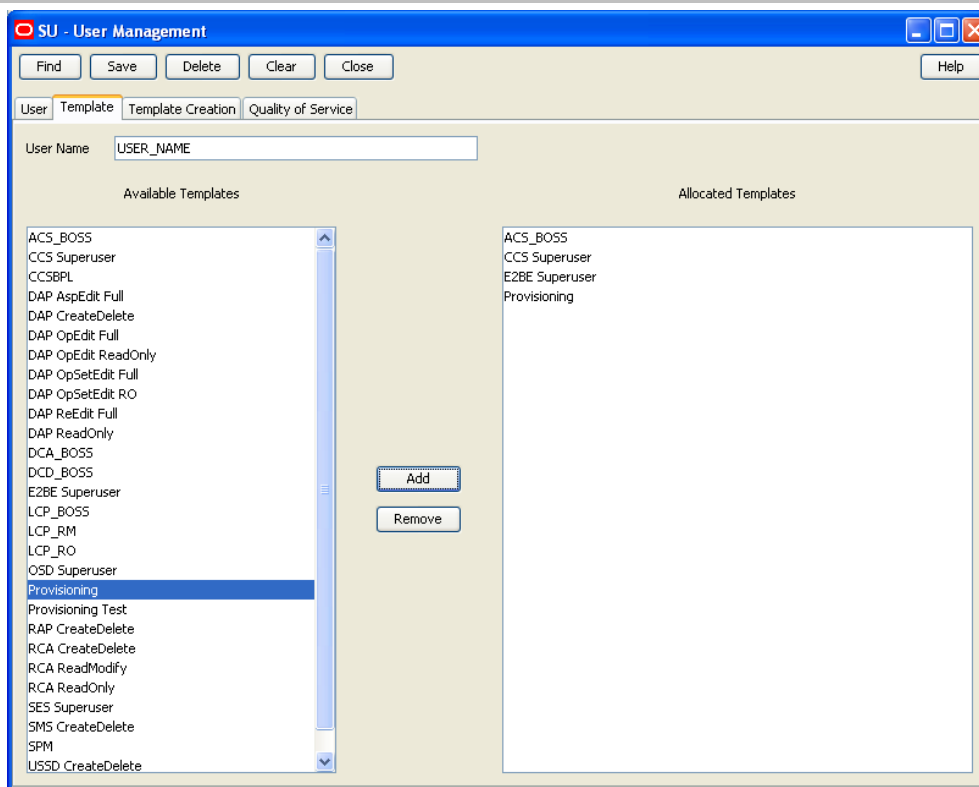


	Change the password, if required, and click <b>OK</b> .
11	When your new SMS user first logs in, no services will have been allocated to them. On the SMS Main screen, select the <b>Services</b> menu to confirm this. All new users are initially created like this by default.

### Assigning Services to user

Follow these steps to assign services to your user.

Step	Action
1	First log out of SMS, then log in again as the super user ( <code>su</code> ). Your user does not have the right to assign services.
2	Select <b>Operator Functions -&gt; User Management</b> , then click <b>Find</b> . <b>Result:</b> You see the SU – Find User screen.
3	Type your user’s name (in whole or part) into the <b>User Name</b> field and click <b>Search</b> . <b>Result:</b> The Search screen will display all users matching your search terms.
4	Select your user by clicking the relevant row in the search results, then click <b>Close</b> . <b>Result:</b> The <b>User</b> tab is now populated with the target user’s ID, and all operations accessible via the tabs across the top of the screen will now relate to that user.
5	Select the <b>Template</b> tab to access Template related options for your user.

**Step Action**


- 6 You allocate templates to the user to give them the ability to manage component services.

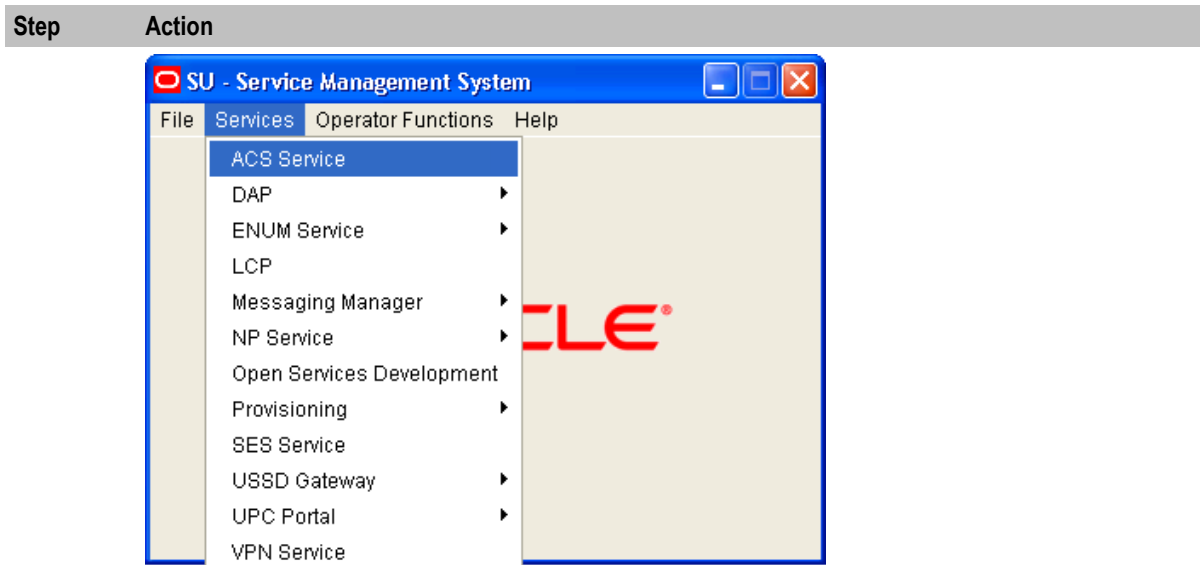
To allocate templates, select a template from the **Available Templates** list and click **Add**, repeating as required.

**Note:** The contents of the **Available Templates** list will vary, depending on which packages have been installed.

- 7 Click **Save** and then **Close**.

- 8 Log out of SMS then log in again using your newly created SMS user.

**Result:** This time you will find you have the service allocated to the template, for example, for ACS\_BOSS, the ACS Service is available.



## Create a Control Plan

### About control plans

Control plans define how calls are processed. The functionality for creating control plans is available in the ACS Control Plan Editor (CPE) accessible from the ACS UI. It includes functionality that enables you to:

- Create control plans.
- Import and export control plans.

A control plan consists of a number of feature nodes connected together. These connections define the possible routes for a call. Each feature node belongs to a specific feature node group in the control plan palette.

When you create a new user, such as the SMS user, only the Base group, containing just the Start and End feature nodes, is available to them. So that your customer can create the control plans they need, you should ensure they have access to the full feature set within the ACS Control Plan Editor. When your customer has access to additional feature sets, they will be able to access additional palettes in the ACS Control Plan Editor.

For more information about using the ACS Control Plan Editor, see *CPE User's Guide*.

### Creating a Basic Control Plan

Follow these steps to create a basic control plan that contains only the Start and End feature nodes.

Step	Action
1	On the Service Management System screen, select <b>ACS Service</b> from the <b>Services</b> menu. The <b>Advanced Control Services</b> window appears.
2	Click <b>Control Plans</b> to open the CPE.
3	From the <b>File</b> menu in the Control Plan Editor window, select <b>New</b> . The Start feature node is added to the control plan.
4	From the Base feature node group in the CPE palette, click and drag the End feature node so that it is below the Start feature node in the Control Plan Editor window.

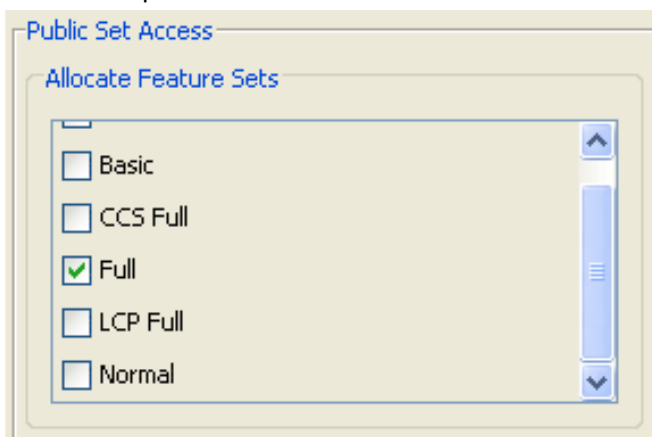
Step	Action
5	Connect the Start feature node to the End feature node by clicking the connection point on the Start feature node and dragging a connecting line to the End feature node.
6	Save the control plan by selecting <b>Save</b> from the <b>File</b> menu and entering a name in the <b>Plan Structure</b> field. When you save the control plan it will be compiled at the same time.
	<b>Note:</b> If you experience problems saving your control plan and you logged in through <b>acs.jnlp</b> , please log out, then access the CPE by selecting <b>Service Management System-&gt;Services &gt; ACS Service</b> .

## Allocating Additional Feature Nodes

Follow these steps to allocate additional sets of feature nodes to the ACS Control Plan Editor for your customer.

**Note:** Only the Start and End feature nodes are available by default.

Step	Action
1	Log in to ACS through one of the following: <ul style="list-style-type: none"> <li>• SMS as a SMS administrator (privilege 6 or 7)</li> <li>• ACS directly with a user account that has privilege level 6.</li> </ul>
2	In the ACS main window, click <b>Customer</b> .
3	In the ACS Customer window, select your customer from the <b>Customer</b> list, then select the <b>Resource Limits</b> tab.
4	Select your customer in the table and click <b>Edit</b> .
5	On the Edit Customer Resources Limits window, select the <b>Full</b> check box in the <b>Allocate Feature Sets</b> panel.



- Click **Save**.
- Click **Close** to close the Customer window, and then log out of SMS or ACS.
- Log in to your customer's user account and re-open the CPE to see the extra feature nodes.



# Service Provider

## Overview

### Introduction

This chapter explains how to configure a service provider.

### In this chapter

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This chapter contains the following topics.

Service Provider Creation.....	9
ACS Configuration.....	15
Service Provider Limits.....	22

## Service Provider Creation

### About service providers

A service provider provides services to your subscribers. You must have at least one service provider. Each service provider contains the specific configuration pertaining to them. For example, service provider configuration includes configuration for charging and accounts.

Each service provider can have their own set of product types. Each product type defines the available services to subscribers with that product type, and includes Product-specific configuration for:

- Subscriber accounts
- Subscriber wallets
- Tariff plans
- Control plans

You can build new services against existing product types that can be unique to a specific service provider or subscriber.

When a call is made that relates to the Prepaid Charging service, the Service Loader performs a number of checks to determine which control plan to use. It looks up the following information:

- The personal wallet of the subscriber's account.
- The product type associated with the subscriber's personal wallet.
- The Capability in that product type that matches the SLEE service key.

The control plan is then matched to the product type Capability.

### Allocating CCS permissions

Before you can create a service provider, you should allocate CCS permissions for the SMS user.

Follow these steps to allocate CCS permissions for the SMS user.

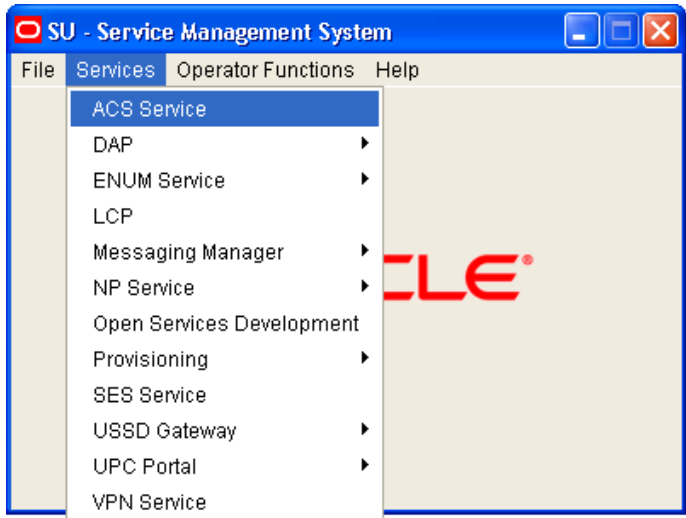
Step	Action
1	Connect to SMS by entering the following url: <code>http://SMShostname/sms.jnlp</code> Where <i>SMShostname</i> is the hostname of an SMS in the IN.
2	Log in to the SMS UI as the su user.
3	Create an SMS user, if you have not created one already. For more information, see <i>Adding the SMS user</i> (on page 3).
4	Allocate the following templates to your SMS user to give them CCS permissions: <ul style="list-style-type: none"> <li>• CCS_Superuser</li> <li>• ACS_BOSS</li> </ul> For more information, see <i>Assigning Services to user</i> (on page 4).

### Creating service provider

Prepaid Charging uses both CCS (Charging Control Services) and ACS (Advanced Control Services). In ACS you will create and configure your service provider, and the control plans that will be mapped to Prepaid Charging product types.

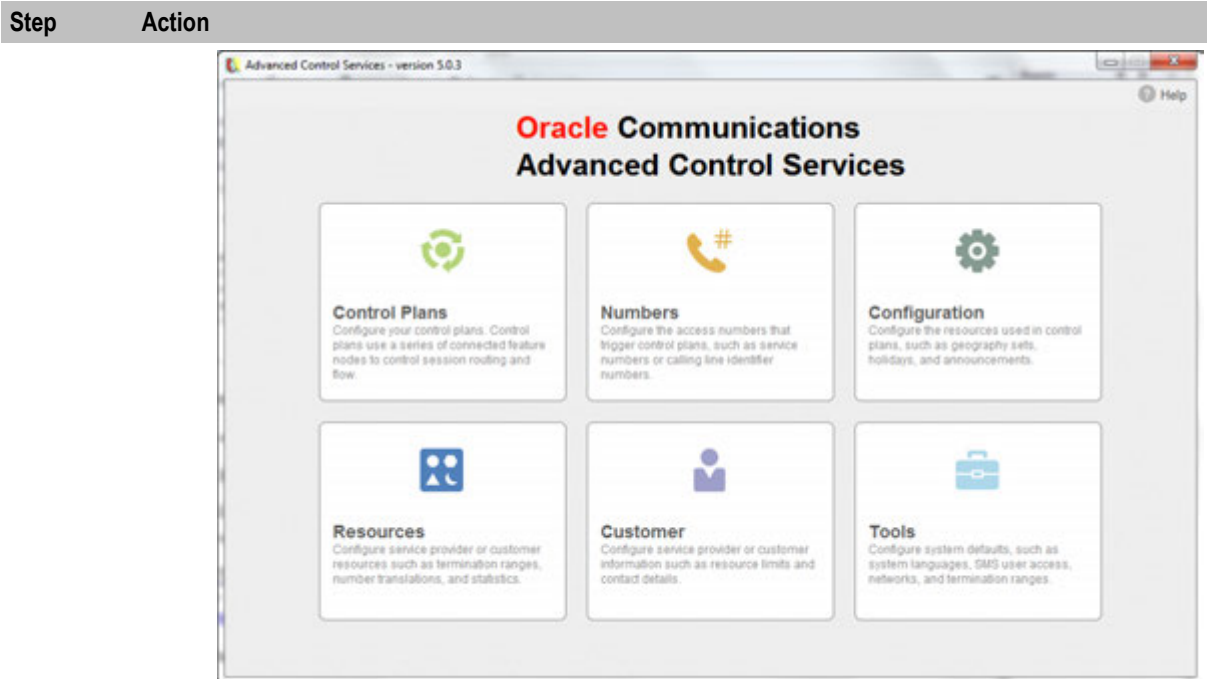
Follow these steps to create a new ACS customer that will become the service provider.

Step	Action
1	Open the ACS UI by selecting <b>ACS service</b> from the <b>Services</b> menu in the <b>Service Management System</b> screen.



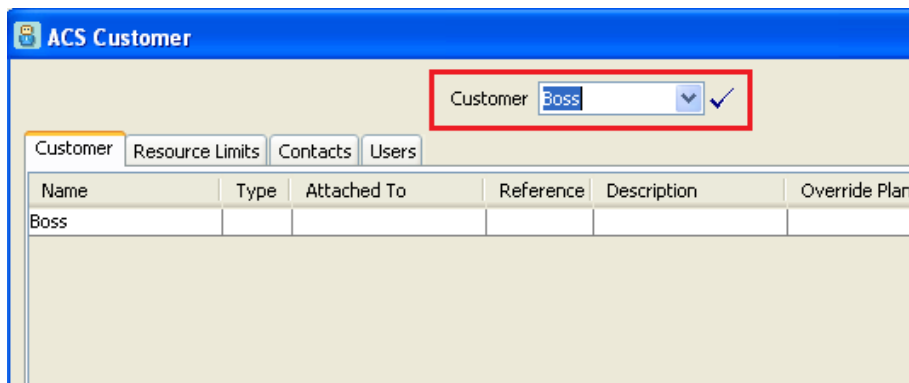
**Result:** The Advanced Calling Services screen is displayed.





2 Click **Customer**.

3 To see what customers are already on the system, clear the **Customer** drop down box and **Enter**.



4 Do one of the following:

- Click **New** to create a new ACS customer.
- Select an existing customer and click **Edit**.

- | Step | Action  |
|------|---|
| 5    | Give your customer a unique name and reference number ( <b>Customer Name</b> and <b>Customer Reference</b> fields). |

Managed customer option means that it is managed through the SMS GUI, so requiring a login to those first. It is also possible to connect directly to the ACS UI by clearing the **Managed Customer** check box.

An administrative user for your new customer will be created for you if you select **Create User for Customer**.

- |   |   |
|---|---|
| 6 | Select the Termination Number Range Rules.<br>The default is <b>No Checking</b> . This will use the Termination Ranges set up on the <b>Termination Ranges</b> tab of the ACS Resources screen. |
| 7 | Click <b>Save</b> when you have finished adding your customer.  |

**Note:** You may need to clear the **Customer** drop down field (often defaulting to Boss) and **Enter** to see your new customer in the list.

## Self managed customer

A self managed ACS customer is a customer who is managed directly in ACS, instead of being managed by the operator in SMS. You must manually create an ACS user for each self managed ACS customer, to enable them to log in to ACS directly.

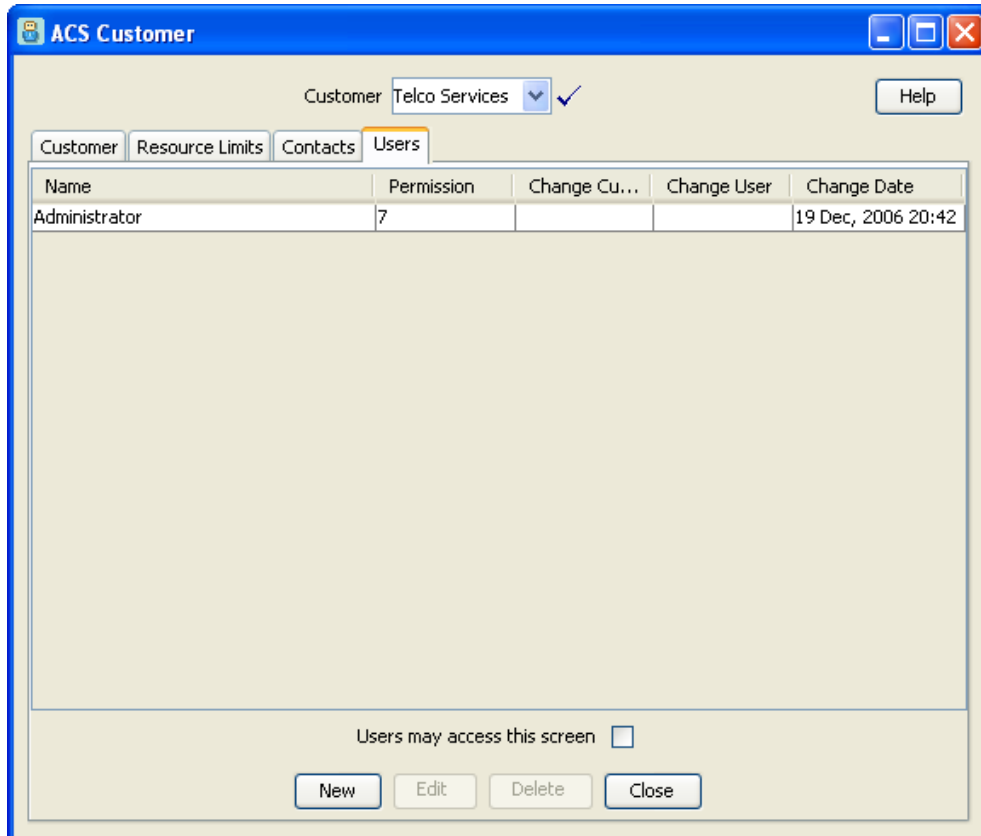
To create or edit a self managed customer user.

Step	Action
------	--------

1 In the ACS Customer window, select your new customer from the **Customer** list.

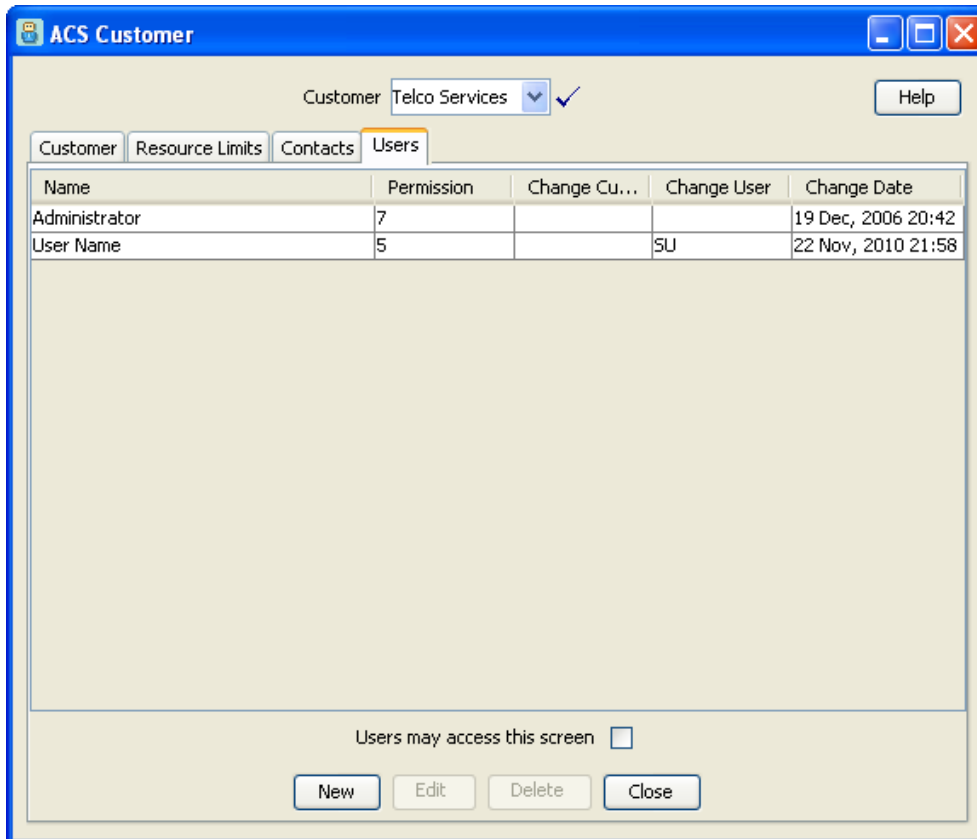
2 Select the **Users** tab.

**Result:** You see a list of all users that the ACS customer has. If you selected **Create User for Customer** when creating a new customer, you will see Administrator in this list.



3 Click **New** to create a new user, or **Edit** to change an existing user. For example you can edit the Administrator user to rename them to be the customer's ACS user.

- | Step | Action   |
|------|--|
| 4    | <p>Enter a name, privilege level, and password for the user.</p> <p>Whether you rename Administrator or create a new user, ensure your user has privilege level 5.</p> <p><b>Note:</b> You may also wish to create a level 6 user for your customer just to compare the differences between level 5 and level 6 users. To allocate privilege 6 to the user, you must log into the Service Management System with a privilege level 7 user (such as the su user).</p> |
| 5    | <p>When you have finished creating or editing your user, click <b>Save</b>.</p> <p>The updated list of users is displayed.</p>   |



- 6 Click **Close**.
- 7 To test the ACS user for your ACS customer, log in to ACS directly as the ACS user, by entering the following url in an internet browser:  
`http://SMShostname/acs.jnlp`  
 Where *SMShostname* is the hostname of the SMS on the IN.

**Note:** If this is a managed customer, you will not be able to log in this way. Instead, the customer will be managed by the operator using SMS. You can access the SMS by entering the following url:

`http://SMShostname/sms.jnlp`

## Create / Allocate data sets to your Service Provider

You can use existing reusable data sets (from the ACS Configuration screen). Ensure your ACS customer/service provider has at least a public set of the following:

- Geographical set
- Holiday set
- Announcement set
- Feature node set (including ACS and CCS feature nodes)

Follow these steps to create / allocate data sets to your service provider.

Step	Action
1	Select <b>Services &gt; ACS Service -&gt; Customer</b> .
2	Allocate Resource limits. On the <b>Resource Limits</b> tab, select your customer and click <b>Edit</b> .  <b>Note:</b> If there are no publicly available data sets for you to use, on the system, you'll need to create your own data set(s).
3	On the Edit Customer Resource Limits screen, set the numbers allowed and click <b>Save</b> .

## ACS Configuration

### Introduction

To configure the ACS component of Oracle Communications Network Charging and Control (NCC), select **Services > ACS Services > Configuration**.

Configure the:

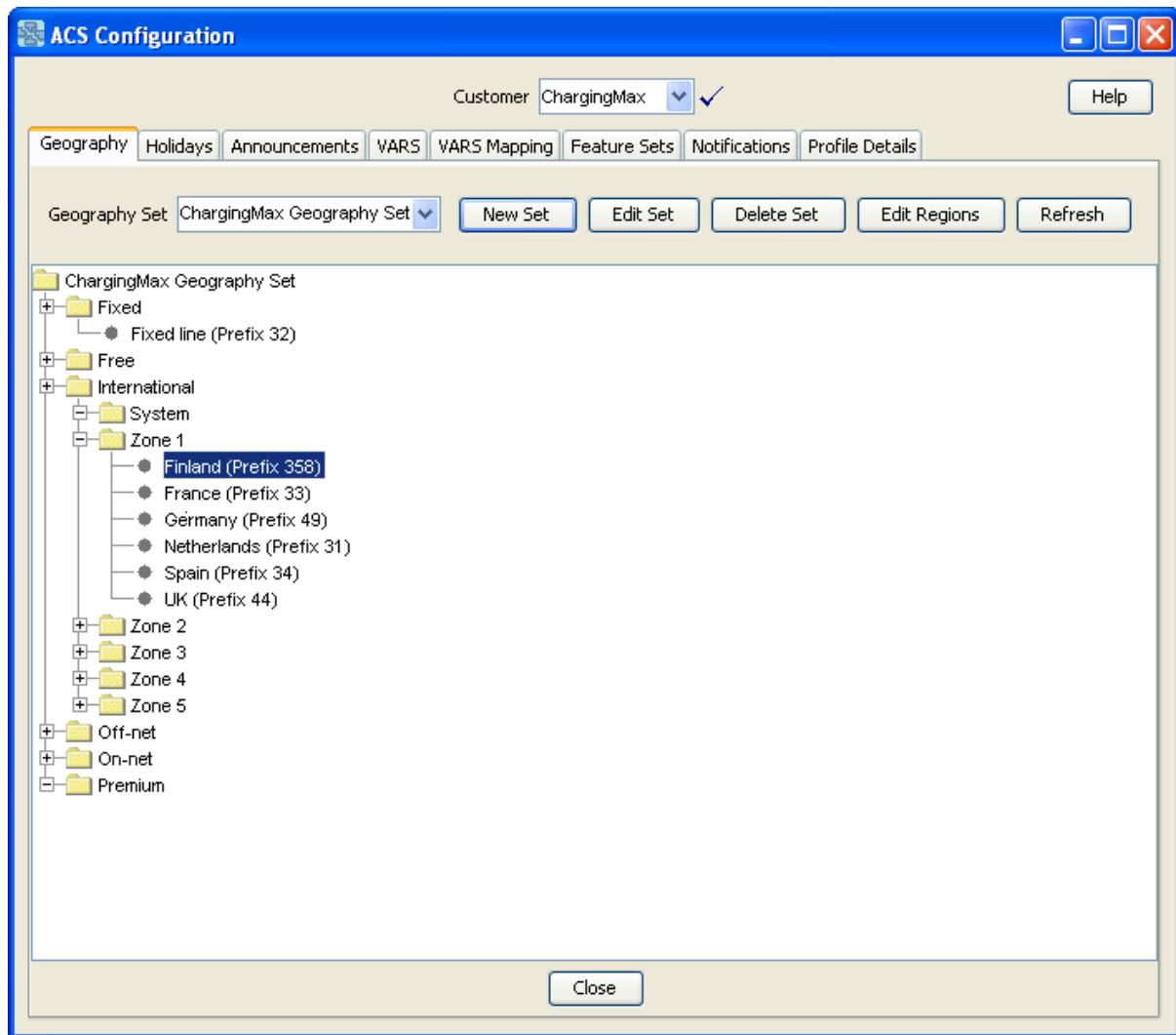
- Geography set
- Holiday set
- Announcement set
- Feature node set

### Geography set

A geography set is used to determine the rating. This is done by grouping prefixes. This allows you to group sets of numbers in one geographical location, so you can create a tariff for all of them at once (but you can also create a tariff specific to each of the prefix).

For example, all mobile numbers (3249, 3247 and 3248) can be grouped under "Belgium Mobile" and a tariff to be created for them.

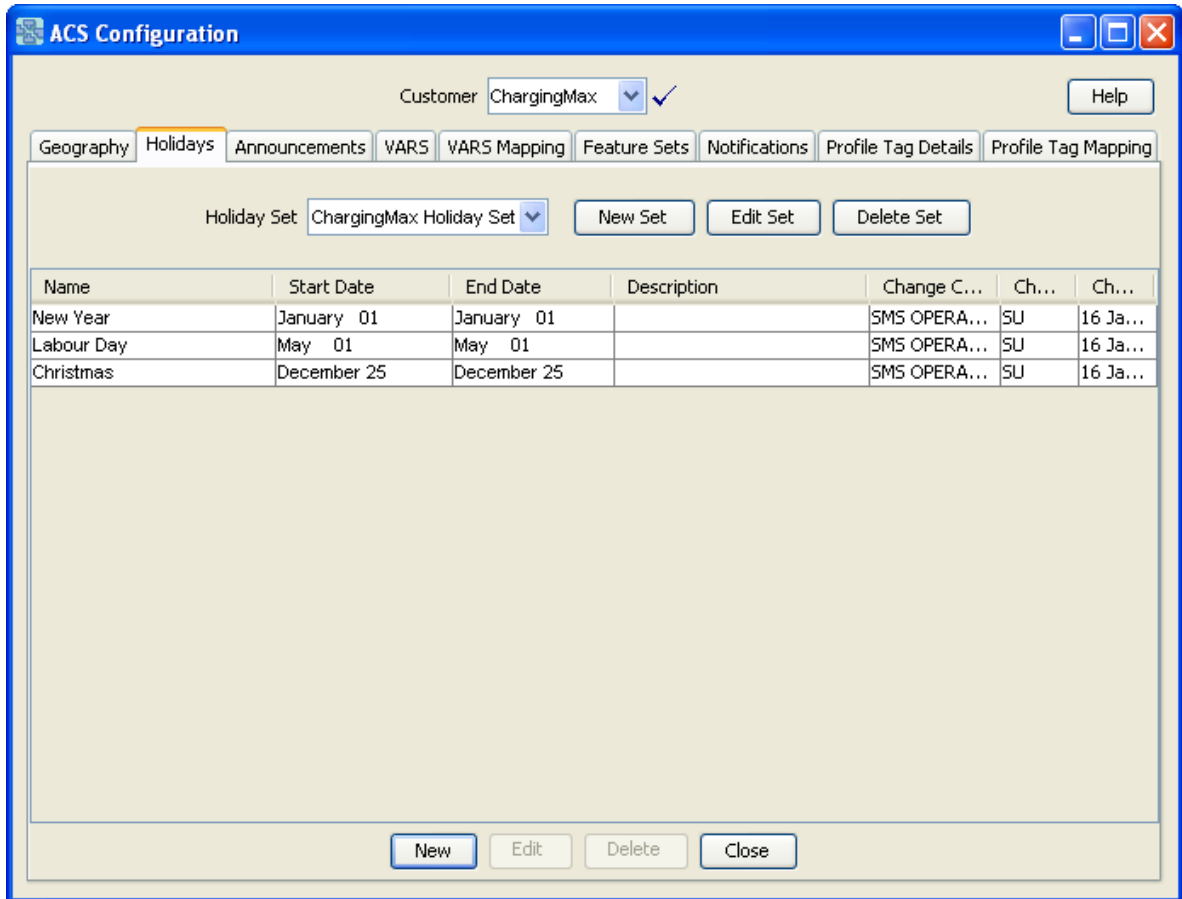
The prefix defines a range of numbers which is generally used to differentiate different operators. Here you can see the default Prepaid Charging geography set.



## Holiday set

This is where holidays are defined (for example, Christmas and New Year.)

Holidays can be defined so that there are cost reductions during that time. Holidays go from a start date to an end date.



## Announcement set

An announcement set is a collection of recorded voice announcements for subscriber interaction.

The screenshot shows the 'ACS Configuration' window with the 'Announcements' tab active. The customer is set to 'ChargingMax'. Below the tabs, there are buttons for 'New Set', 'Edit Set', 'Delete Set', and 'Refresh'. The main area contains a table of announcement sets.

Name	Description	Change C...	Change User	Change Date
Account disabled	Your account is currently disabled. Please contact...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
Account expiry	Your wallet will expire in <vp> days.	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
Balance expiry	This balance will expire in %% days.	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BDR Discount	This gives you a discount of %% percent on all nat...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BDR Help	<help announcement explaining what BDR is>	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BDR Insufficient	This is insufficient to qualify for a BDR discount...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BDR Menu	To check your current BDR discount level press 1, ...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BF Current	Your Best Friend number is currently set to %%	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BF Enter number	Please enter the new Best Friend number, followed ...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BF is set	Your Best Friend number has been modified.	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BF New FF is BF	The number you have entered is currently your Best...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BF not set	You currently do not have a Best Friend number.	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BF Number already present	The number you have entered is already your Best F...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BF Promotion	The number you have entered is currently on your F...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Activated	has been activated. It will remain valid for %% d...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Active	is currently active. This Booster will expire in ...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Active Subscribe	To subscribe to this Booster so it is renewed auto...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Booster 1	(name of booster 1) booster	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Booster 2	(name of booster 2) booster	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Booster 3	(name of booster 3) booster	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Booster 4	(name of booster 4) booster	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Booster 5	(name of booster 5) booster	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Booster will expire	This booster will expire on (date).	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Help	<TBD - Help information for Booster service>	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...
BOOST Inactive	To purchase a Booster, press 1. To subscribe to a ...	SMS OPERA...	ACS_ADMIN	22 Oct, 2010 ...

At the bottom of the window, there are buttons for 'New', 'Edit', 'Delete', and 'Close'.



In that announcement set, you have a collection of announcements which are linked to a resource ID (to be played on the IVR) and a corresponding language.

**Edit Announcements**

Entry

Name: Account disabled

Description: Your account is currently disabled. Please contact...

Language	Resource Name	Resource ID	VARS Mapping
English	SRF	100	-
French	SRF	100	-

Mapping Editor

Language: English

Type of Mapping:

- Resource ID + Resource Name
- VARS Mapping

Resource Name: [ ]

Resource ID: [ ]

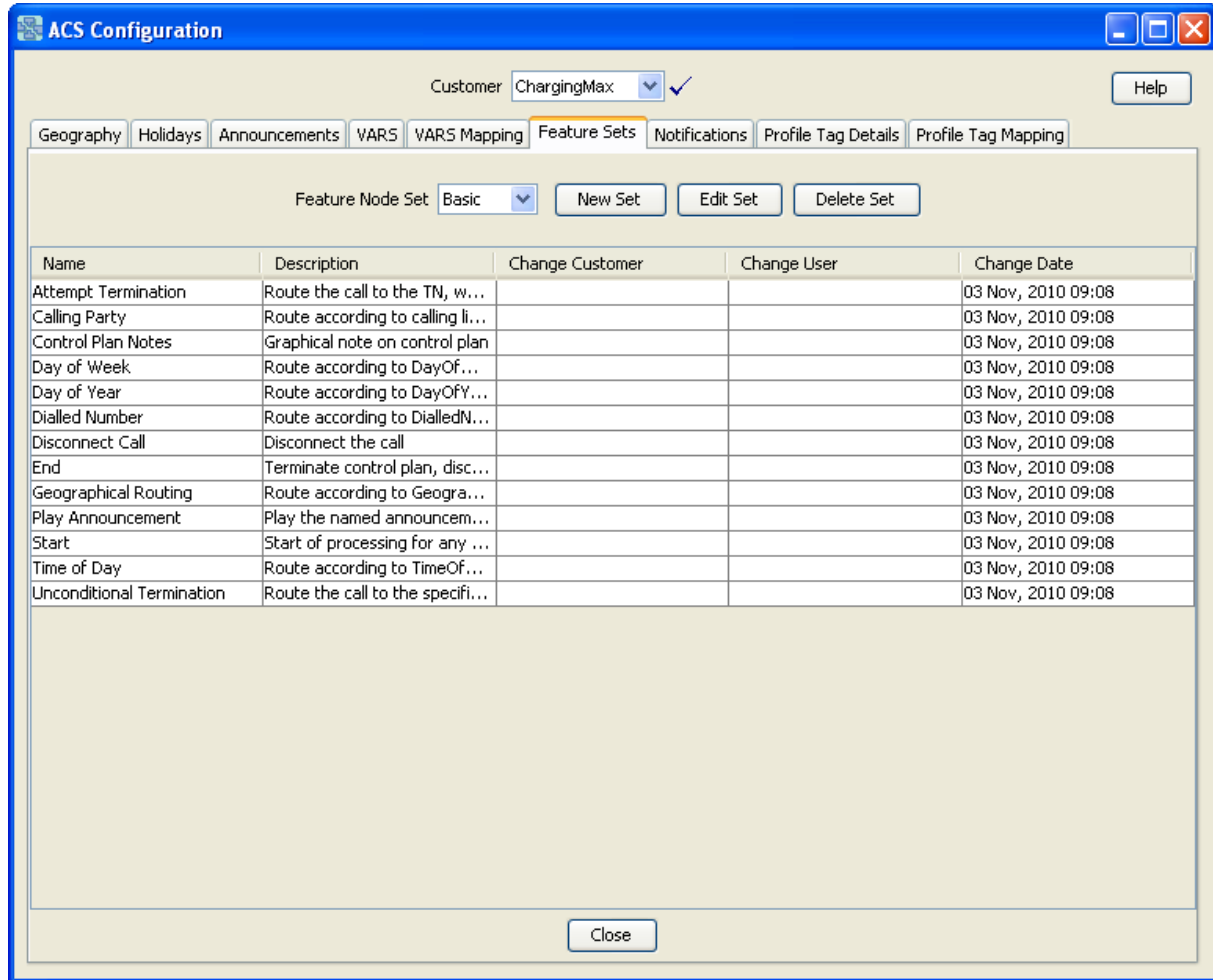
Add

Remove

Save Cancel Help

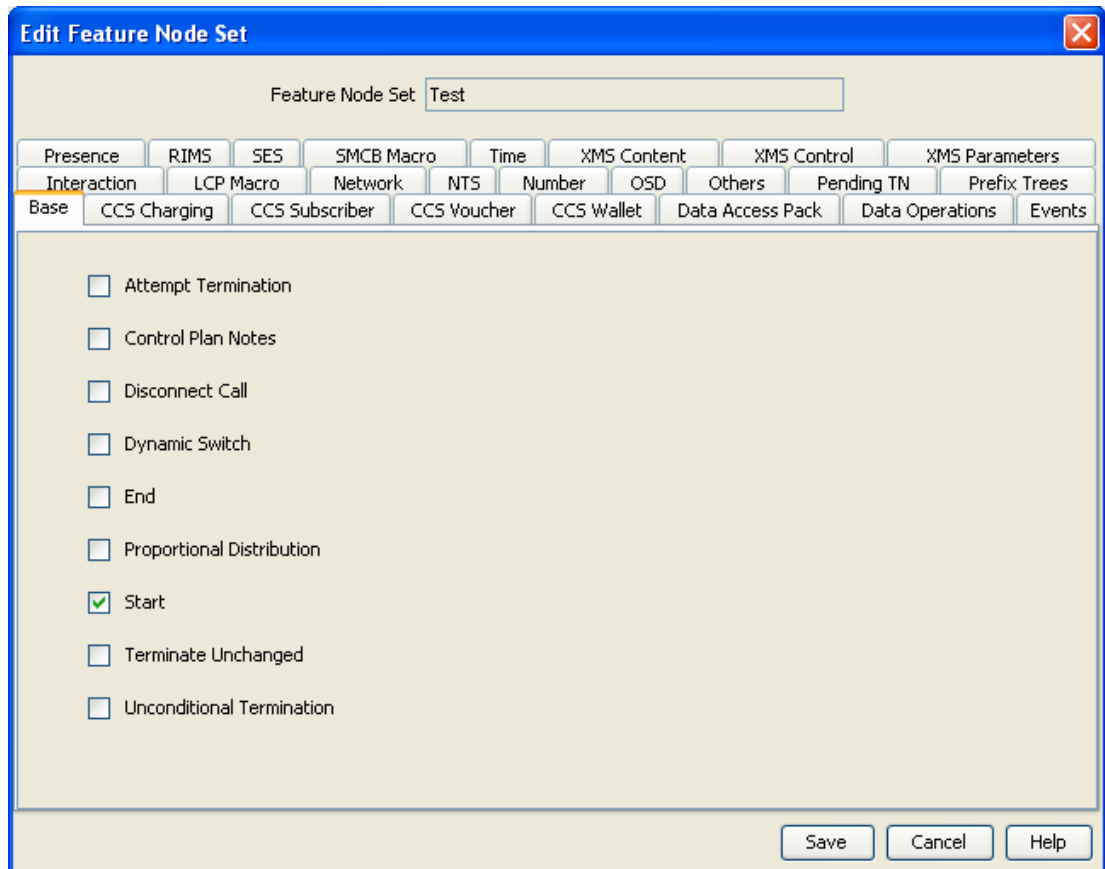
## Feature Node set

This describes the feature nodes that are available for creating a control plan.

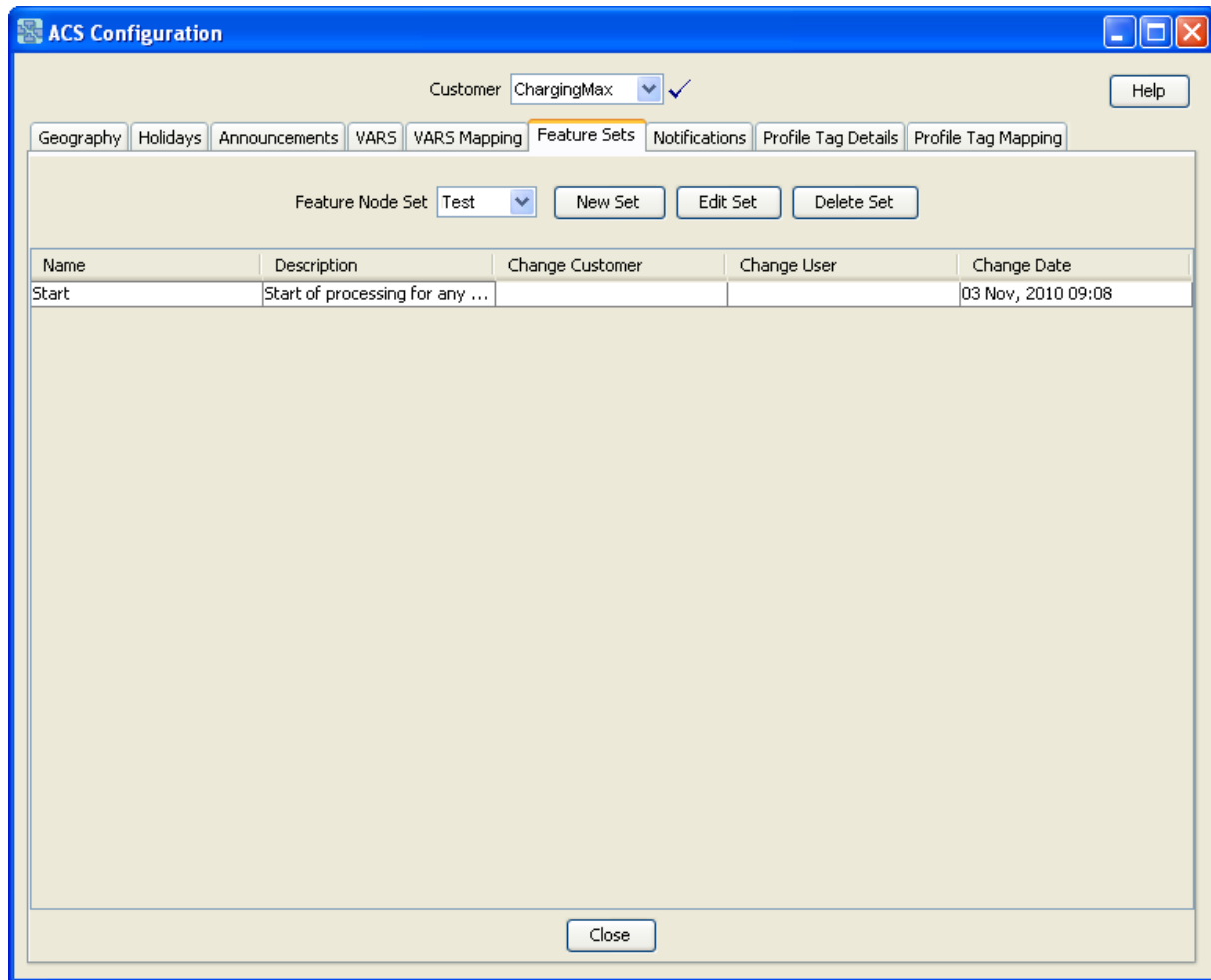


You can create a specific set to restrict rights for your users.

**Example:** If you create a feature set, then edit it to include only the Start feature node:



The feature set will look like this:



## Service Provider Limits

### Introduction

Using CCS, for the service provider, you can set the resource limits, in particular:

- Limits
- Business Prefix
- Sets
- Call barring
- Number translations

### Setting limits

Follow these steps to set resource limits.

Step	Action
1	Select <b>Services &gt; Prepaid Charging -&gt; Service Management</b> .
2	Select the <b>Resource Limits</b> tab.

Step Action

The screenshot shows a window titled "Service Management" with a blue title bar. The "Service Provider" dropdown is set to "Boss". A "Help" button is in the top right. Below the title bar is a navigation menu with tabs: "Number Translation List", "Global Configuration", "Splash Screen Configuration", "Security", "Exchange Rates", "Balance Type Mapping", "Barred List", "MFile Generation", "Resource Limits", "Capability", "Domain", "Currency", and "Currency Code". The "Resource Limits" tab is active. The main area contains several input fields:

- Maximum Product Types: 0
- Maximum Voucher Types: 0
- Maximum Rate Tables: 0
- Grace Period (seconds): 0
- Maximum Bad PIN Count: 3
- Number of Product Types Used: 0
- Number of Voucher Types Used: 0
- Number of Rate Tables Used: 0
- Number of Promotion SMSs Sent: (empty)
- Global Business Prefix: 111

At the bottom are "Edit" and "Close" buttons.

3 Click **Edit** to open the Edit Resource Limits screen.

Step	Action
------	--------

- 4 In the following options, choose and set appropriate limits for the service provider:
- Limits
  - Business Prefix – Business Prefix must be provided otherwise the **Save** button will be disabled.
  - Sets – Select all the Reusable Data Sets which the new service provider should have access to.

**Note:** If the Business Prefix is entered by the subscriber at the beginning of a dialed telephone number the call will be charged to their business wallet instead of their personal wallet. Allowed values include 0-9, # and \*.

This functionality is dependant on the configuration of the control plan

- 5 In the Call Barring option, ensure the **Ignore** check box is selected for this service provider.
- 6 In the Number Translations option, set up a short number which will connect directly to the main company's call center.
- Enter short code to be dialed into the **In** field.
  - Enter the termination number (actual phone number to be dialed) into the **Out** field.
  - Click **Add**.
- 7 Click **Save**.

# Product Type

## Overview

### Introduction

This chapter explains the product types.

### In this chapter

---

This chapter contains the following topics.

Product Types ..... 25

## Product Types

### About product types

A product type is a collection of services that are provided to the group of subscribers who use that product type.

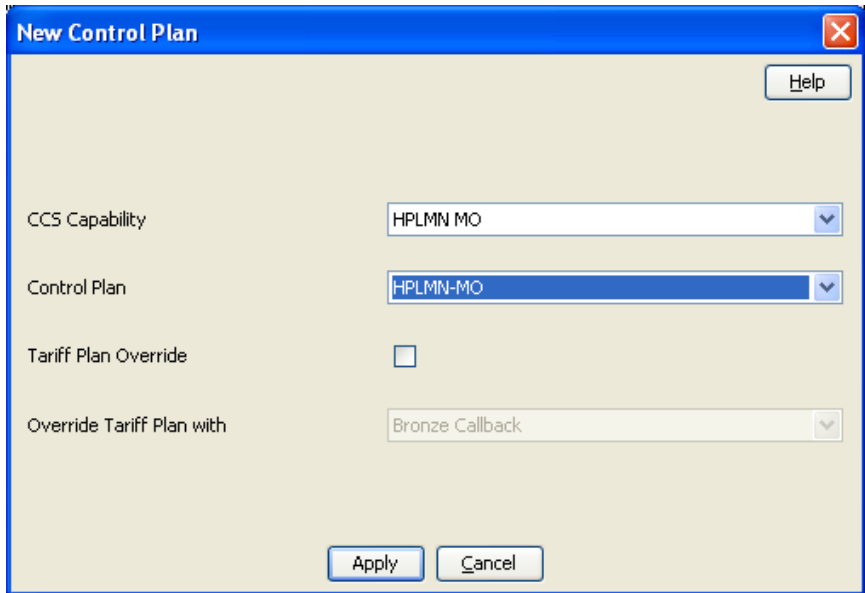
### Creating product types

Follow these steps to create a product type.

Step	Action
1	You create a product type with: <ul style="list-style-type: none"> <li>• A default tariff plan. See <i>Creating a Tariff</i> (on page 33) to create one.</li> <li>• A control plan associated with it. See <i>Create a Control Plan</i> (on page 6) to create one.</li> <li>• Some announcements. See <i>Announcement set</i> (on page 18) to create some.</li> </ul>
2	On the Subscriber Management screen, select the <b>Product Type</b> tab, then <b>New</b> .
3	Set the "Initial Value" of the product type to 20 euros.
4	Create a new CCS Capability, see <i>Creating a capability</i> (on page 50). Select a CCS Capability from the drop down menu (defined in the <b>acs.conf</b> file).

Step	Action
------	--------

5 Select the control plans option, then **New**.



6 Select the control plan created earlier.

7 Select the Announcements option and select the Announcement set created earlier.



# Subscribers

## Overview

### Introduction

This chapter explains how to create subscribers.

### In this chapter

---

This chapter contains the following topics.

Subscriber Creation ..... 27

## Subscriber Creation

### Introduction

The CCS component of Prepaid Charging provides subscriber account management and tariffing. The VWS provides subscriber account's fund management and implements charging reservations and debiting. The VWS supports these types of subscriber accounts:

- Prepaid
- Postpaid
- Limited Credit
- Prepaid
- Throwaway

A product type is assigned to a subscriber, so this must be first set up before you can create a subscriber. For this example, you will set up a test subscriber account. This will be used to test your product type created in the previous example. You will also use this subscriber for subsequent examples.

### Credit type

A subscriber's credit type is set by its Wallet Limit Type:

- Credit/Postpaid subscriber – Fully postpaid and rechargeable.
- Limited Negative Credit subscriber – Rechargeable subscriber account with a post-paid facility that allows it to go overdrawn to a configurable limit.
- Debit/Prepaid subscriber – Rechargeable prepaid.
- Single User Prepaid Card – Non-rechargeable credit (can be used as a promotional give-away).

### Subscribers and MSISDNs

A subscriber account is linked to a specific MSISDN. The MSISDN is identified by one of the following:

- The Calling Line Identifier (CLI), also known as the Calling or Originating Number.
- A prefix dialed by the subscriber before a call.

You can configure a subscriber in the following ways:

- As a subscriber with a single balance.
- As a subscriber with one or more wallets, and multiple balance types.
- As a balance subscriber account used by multiple MSISDNs.

You can link more than one MSISDN to a subscriber.

### Subscriber experience of making a call

How a subscriber makes a call depends upon whether the caller is using the subscriber's known phone line (CLI), or making a call from an independent phone.

If using a configured CLI, the subscriber goes off-hook and dials a destination number. The control plan for the product type is triggered based on the CLI.

If the subscriber is making a call from an un-configured CLI, they call the service, (for example, by dialing a dedicated 0800 number) and Oracle Communications Network Charging and Control (NCC) processes the call as follows:

- 1 They are played a beep and must enter their subscriber account ID and PIN.
- 2 If successfully validated, the caller is prompted to enter the intended destination number. The control plan for their product type is triggered on their subscriber account ID.
- 3 The service then checks their balance status and either connects the call as requested, disconnects (in case of no credit), or redirects the call (depending on the control plan).

Subscriber accounts must have product types (which define how the account is charged), and wallets (which hold value). The requests that Prepaid Charging makes on the billing engine contain information about the wallet it is accessing.

### Viewing existing subscribers

Follow these steps to find all existing subscribers.

Step	Action
1	Select <b>Services &gt; Prepaid Charging &gt; Subscriber Management</b> .
2	Select the <b>Subscriber</b> tab.
3	In the <b>Card Number</b> text field, type % and <b>Search</b> . <b>Result:</b> The list of subscribers, if any are present, is displayed in the table. For each you see: wallet reference, card number, and subscriber ID.

### Creating a subscriber account

Follow these steps to create a new subscriber account.

Step	Action
1	Select <b>Services &gt; Prepaid Charging &gt; Subscriber Management</b> .
2	Select the <b>Subscriber</b> tab.
3	Click <b>New</b> . <b>Result:</b> The New Subscriber screen is displayed.
4	Enter: <ul style="list-style-type: none"><li>• Card Number</li><li>• Subscriber ID</li><li>• Language</li></ul> Click <b>Save</b> .

Step	Action
------	--------

**Result:** The New Wallet screen is displayed.

- 5 Select the tariff plan created earlier, the billing pair you want it to be on. This is enough to start doing chargeable calls for this subscriber.

## Wallet

A wallet, in concept, is used to hold the balances, for example, for SMS, voice, and general cash. A wallet is allocated to a subscriber to hold their balances. Each subscriber can have a personal and a business wallet (which may be shared). To create or edit wallet data, the SMS must be successfully communicating with the associated VWS. The ccsBeOrb process is used for this communication.

Complete the New Wallet screen. Set up the required data and accept the defaults by clicking **OK**.

## Block a subscriber

For this task, you will test that a frozen subscriber account cannot make a call.

Change your subscriber's account to freeze the account:

- On the Edit Subscriber screen, Subscriber > Wallets option, change the **Wallet State** to frozen.
- **Apply** and **Save** the changes.
- Run a Split script to emulate the above 'frozen' subscriber trying to make a call.

## Unblock a subscriber

Follow these steps to unblock the previously blocked subscriber account.

Step	Action
1	Search for the previously blocked subscriber's account and open it.
2	Unblock the account by changing the account status so that it is active.
3	Run a Split script to emulate the subscriber trying to make a call.



# Rating and Tariffs

## Overview

### Introduction

This chapter explains rating and tariffs.

### In this chapter

---

This chapter contains the following topics.

Tariff Creation.....	31
Creating a Tariff.....	33

## Tariff Creation

### Introduction

Prepaid Charging calculates the standard tariff from the CLI (calling line identifier / origin) and SN (service number / destination) numbers of the call and accepts or rejects a call. Your new brand provides a standard calling rate which enables subscribers to call cell phones at a reduced cost.

### Rating

Rating is provided for:

- Voice calls
- Data calls
- Specified Events (including SMS messages)
- Call charges can include a:
  - Maximum or minimum charge for each call/data session
  - Minimum charge period after which charging starts
  - Low credit warning threshold
- Rating can be based on complex configurable factors, including:
  - Duration
  - Destination number, (including its geographical location)
  - Foreign roaming network
  - Day of year, day of week, and time of day

### Components

Calls are controlled using ACS.

The Voucher and Wallet Server (VWS) handles money.

CCS deals with charging rules, for example: it costs  $x$  amount of money to call from place A to place B for  $n$  minutes. There are also further calculations related to discounts for certain days/weeks and specific sections of a call. The charge for a call or data session is set by the subscriber's product type in CCS.

## Tariff plans

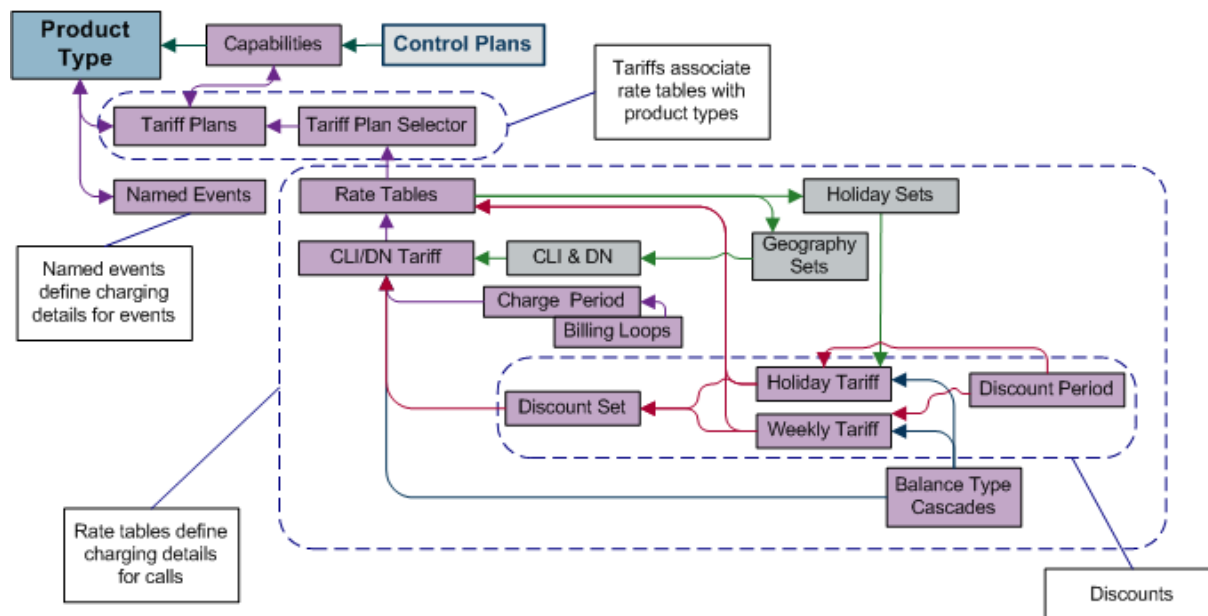
Tariff plans enable you to define which rate table applies to a product type at a particular time.

Rate tables define how Prepaid Charging charges for calls.

An ACS customer requires a tariff plan, such that they can provide a service which charges special rates for some locations.

## Tariff configuration

This diagram shows tariff configuration.



## Creating tariff plan

The tariff plan defines rules for how a call by your subscribers will be charged. You will also generate the memory mapped file used on the billing engine.

For your product type, you will create a tariff, by:

- Configuring a rate table:
  - Rate table, charge periods, balance type cascade, discount sets, CLIxDN tariffs, and the rest
- Configuring a tariff plan:
  - Link tariff plan to rate table using the **Tariff Plan Selector** tab
- Configuring discounts:
  - Create discount periods, and weekly and holiday tariffs
- Creating named events
- Creating a MFile (memory mapped file for BE containing rating information).

Tariffing needs to be created in order to be able to do billing. It all starts by creating a new tariff plan, this will be the way of billing used in the product type.

# Creating a Tariff

## Introduction

In order to create a proper tariff, you'll need to create the following, in this order.

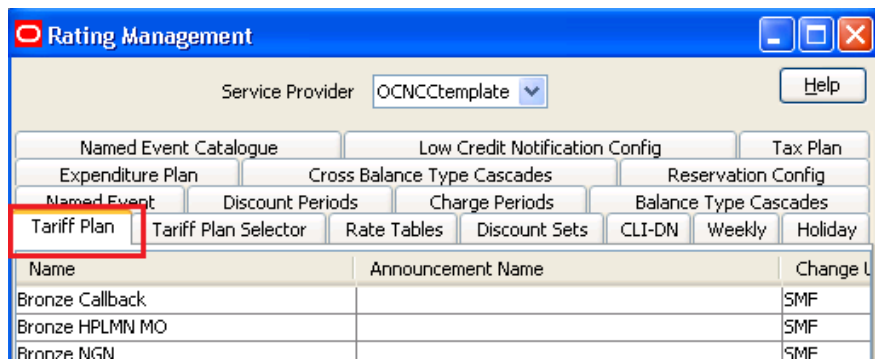
- *Geography set* (on page 15)
- *Holiday set* (on page 16)
- *Tariff plan* (on page 33)
- *Rate table* (on page 34)
- *Tariff plan selector* (on page 35)
- *Balance type cascade* (on page 35)
- *Charge period* (on page 36)
- *Discount set* (on page 37)
- *Discount period* (on page 38)
- *CLI-DN* (on page 39)
- *Weekly tariff* (on page 40)
- *Holiday tariff* (on page 41)
- *MFile* (on page 42)

## Tariff plan

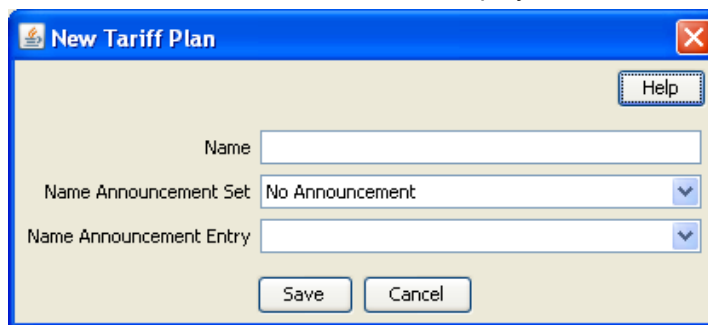
Follow these steps to create a tariff plan.

Step	Action
------	--------

- 1 Select the **Tariff Plan** tab.



- 2 Click **New**.  
**Result:** The New Tariff Plan screen is displayed.



- 2 Give your tariff plan a name.

Step	Action
3	Click <b>Save</b> .

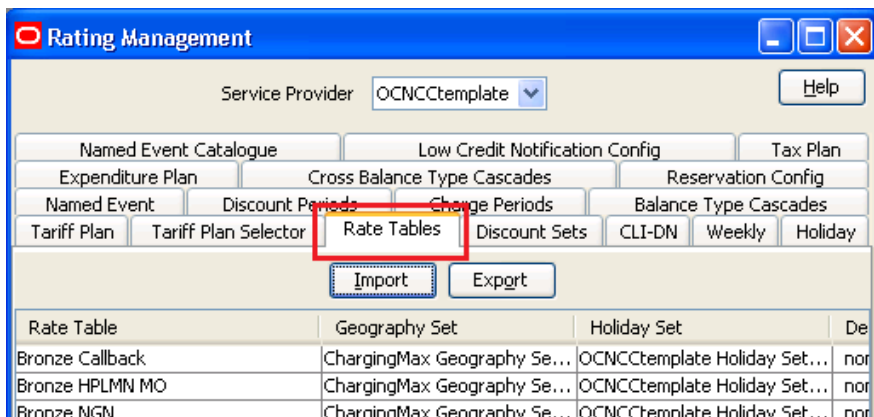
### Rate table

Rate tables define charging details for calls. This data is used to set the charging rates according to specific dates and geographical location.

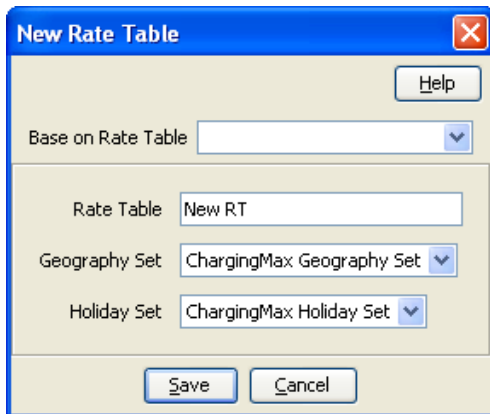
**Note:** It is not possible to change the geography set for a rate table once saved. You first must delete all records associated with the rate table, then delete the rate table and re-create it.

Follow these steps to create a rate table.

Step	Action
1	Select the <b>Rate Tables</b> tab.



- Click **New**.  
**Result:** The New Rate Table screen is displayed.



- Give your rate table a name.
- Select a Geography set.
- Select a Holiday set.
- Click **Save**.



## Tariff plan selector

The tariff plan selector links the tariff plan and the Rate Table. Follow these steps to create a tariff plan selector.

Step	Action
1	Select the <b>Tariff Plan Selector</b> tab.
2	Click <b>New</b> . <b>Result:</b> The New Tariff Plan Selector screen is displayed.

3	Select a tariff plan.
4	Select a rate table.
5	Update the effective date
6	Click <b>Save</b> .

## Balance type cascade

A Balance Type Cascade includes the different Balance Types that are available to pay for the cellphone calls. Here you will set the order in which the balance types will be exhausted.

**Note:** You may want to use this Balance Cascade pattern in other tariffs, so give it a name which is descriptive of the pattern, not the tariff you are planning to use it in.

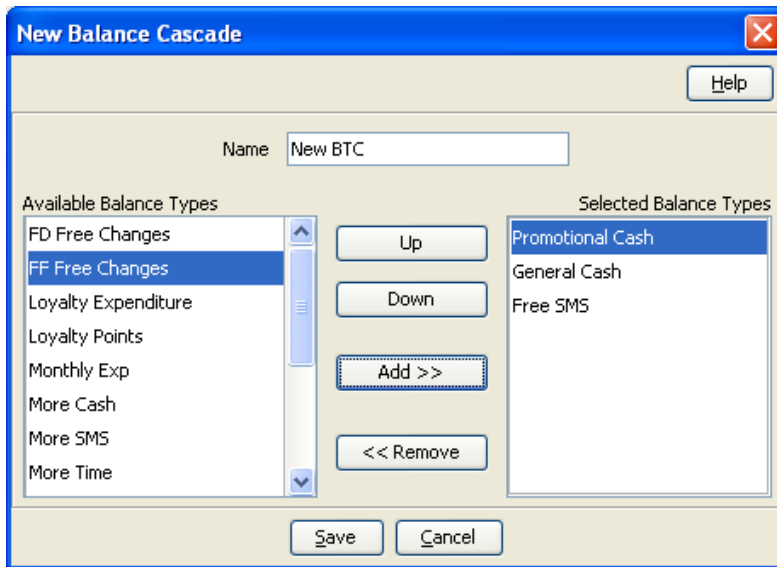
The Balance cascade is how the balance is going to be used, if we take the example bellow, we will first use the Promotional Cash, then the General Cash, then the Free SMS. For example:

- 1 Promotional Cash
- 2 General Cash
- 3 Free SMS

Follow these steps to create a balance cascade.

Step	Action
1	Select the <b>Balance Type Cascades</b> tab.
2	Click <b>New</b> . <b>Result:</b> The New Balance Cascade screen is displayed.

Step	Action
------	--------



- 3 Type a Balance Type Cascade name
- 4 Select an available balance type and **Add**. Repeat until you have selected all balance types you require.
- 5 Use **Up / Down** to order the selected balance types.
- 6 Click **Save**.

### Charge period

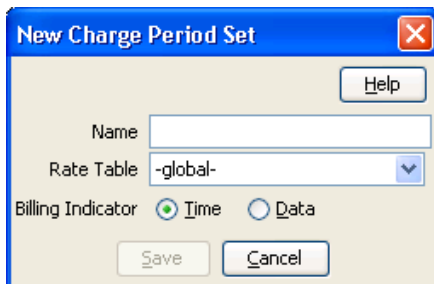
A charge period is charging rate per minute. First you create a charge period set by simply giving it a name, then you choose a rate table to give you the charge rates. With this information you can then create the charge periods for that set.

For example: 10 cents the first 60 seconds, then 5 cents per minute for the rest of the call.

Follow these steps to create a charge period set with charge periods.

Step	Action
------	--------

- 1 Select the **Charge Periods** tab.
- 2 Click **New Set**.  
**Result:** The New Charge Period Set screen is displayed.



- 3 Type a name for the charge period set
- 4 Select the associated rate table.
- 5 Select the billing indicator.
- 6 Click **Save**.

Step	Action
------	--------

- 7 Highlight the charge period and click **New**.  
**Result:** The New Charge Period screen is displayed.

- 8 The first period starts at 0 sec and is charged at 10c/min.  
 Create a charge period with a:
  - Period start of 0
  - Charge of 10
 and click **Save**.
- 9 The second period starts at 60 seconds and is charged at 5c/min, but the charge is per second.  
 Create another charge period with a:
  - Period start of 60
  - Charge of 5
 and click **Save**.

Refer to *CCS User's Guide* for more information about the fields.

## Discount set

The discount set is only a name and description.

This set is associated with the holiday and weekly tariffs and is used to provide a logical link from the rate table to the CLI-DN data. If no holiday or weekly discounts are set, the discount set will not apply.

A discount period defines the discount percentage to be applied to a charge period.

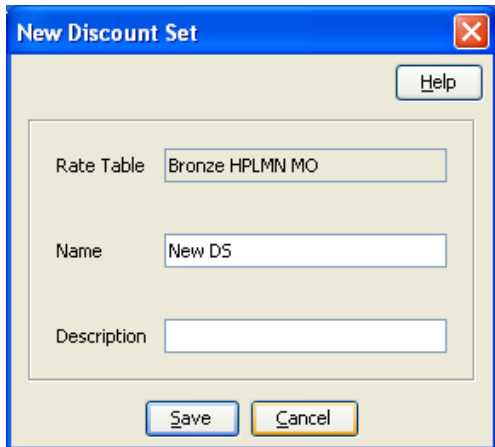
Follow these steps to create a new discount set and discount periods for the discount period set.

Step	Action
------	--------

- 1 On the **Discount Sets** tab, select, from the **Rate Table** drop down box, the rate with which to associate a discount set.

Step	Action
------	--------

- 2 Click **New**.  
**Result:** You see the New Discount Set screen.



The **Rate Table** field displays the rate table selected.

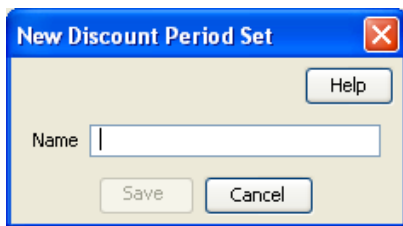
- 3 Enter a name and description.
- 4 Click **Save**.

### Discount period

A discount period defines the discount percentage to be applied to a charge period. Follow these steps to create a new discount set and discount periods for the discount period set.

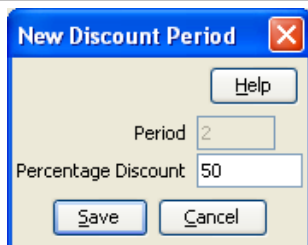
Step	Action
------	--------

- 1 Select the **Discount Periods** tab.
- 2 Click **New Set**.  
**Result:** You see the New Discount Period Set screen.



- 3 Enter a name and click **Save**.
- 4 Then create a new discount period where a percentage of discount is defined. On the **Discount Periods** tab, select the discount period set from the **Discount Period** drop down box.
- 5 Click **New**.  
**Result:** You see the New Discount Period screen.

Step	Action
------	--------



The **Period** field displays the amount of time before the charge is initiated.

In the **Percentage Discount** field, type the numeric percentage of the discount to be applied to the charge period, in this example, 50%.

6 Click **Save**.

7 Create as many discount periods as required to match your charge period.

Refer to *CCS User's Guide* for more information about discount usage.

## CLI-DN

A CLI-DN (Calling Line Identifier – Destination Number) record defines, for the rate table, the rate for calls between two geographical areas.

Use the records you have defined so, to configure a CLI-DN record applicable to the rate table you created. Each rate table includes rates for calls between two geographical areas.

The tariff code is a 2 digit hexadecimal code that is usually provided by the switch manufacturer. The tariff code is set in **ACS Services -> Resources -> Tariff Codes**. There you will see SCI (Set Charging Info) and FCI (Furnish Charging Info). SCI is set when you receive the tariff code from the switch.

Follow these steps to create a new CLI-DN.

Step	Action
------	--------

1 Select the **CLI-DN** tab.

2 Click **New**.

**Result:** The New CLI-DN Tariff screen appears.

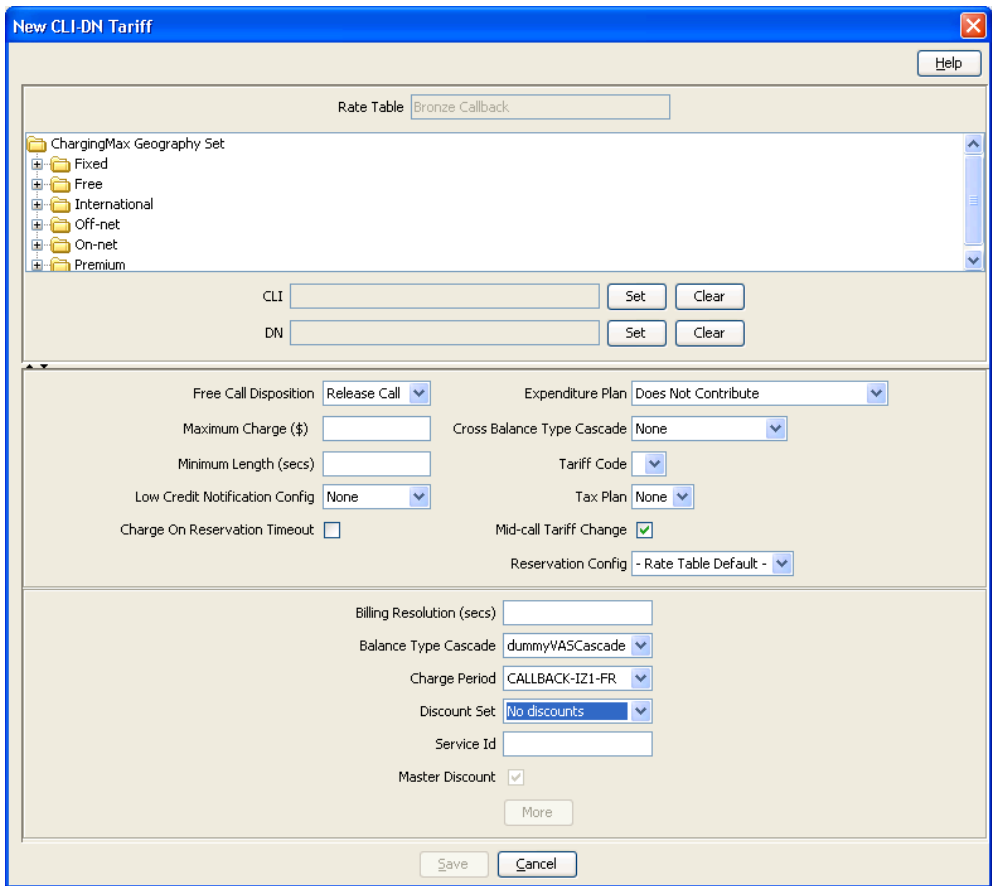
Select the following from its respective drop down list:

- DN
- Discount set
- Charge period
- Cross balance type cascade

Set the following fields:

- Maximum charge
- Minimum length
- Billing resolution
- Low credit

Step	Action
------	--------



3 Click **Save**.

### Weekly tariff

Weekly tariff are used to define specific discount during period of the week (off-peak for example). Follow these steps to create a weekly tariff.

Step	Action
------	--------

- 1 Select the **Weekly** tab.
- 2 Click **New**.  
**Result:** The New Weekly Tariff screen appears.

Step	Action
------	--------

- 3 Fill in the fields.  
Refer to the *CCS User's Guide* for information about the fields.
- 4 Click **Save**.

## Holiday tariff

Holiday tariffs are used to define the specific discounts that will apply during holidays.

Step	Action
------	--------

- 1 Select the **Holiday** tab.
- 2 Click **New**.  
**Result:** The New Holiday Tariff screen appears.

Step	Action
------	--------

- 3 Fill in the fields.  
Refer to the *CCS User's Guide* for information about these fields.
- 4 Click **Save**.

## MFile

MFile is the core of the rating system. It is a file that is mapped into memory (using standard Unix mmap - memory mapping functionality). The data contained within the file is generated from all the rating data configured within the database. This file removes the requirement for database access for call rating data, which offers speedier access to the data.

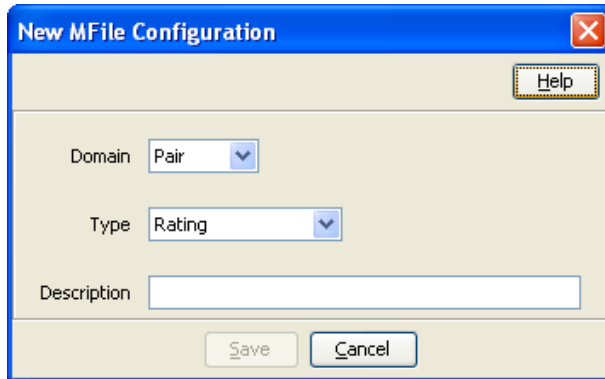
Follow these steps to create an MFile.

Step	Action
------	--------

- 1 Select **Prepaid Charging** -> **Service Management** and select the **MFile Generation** tab.
- 2 Click **New**.  
**Result:** The New MFile Configuration screen appears.



Step	Action
------	--------



The screenshot shows a dialog box titled "New MFile Configuration". It features a blue title bar with a close button (X) in the top right corner. Below the title bar, there is a "Help" button. The main area of the dialog contains three fields: a "Domain" dropdown menu currently showing "Pair", a "Type" dropdown menu currently showing "Rating", and a text input field for "Description". At the bottom of the dialog, there are two buttons: "Save" and "Cancel".

- 3 Select the Pair on which creating the MFile.  
Select the Type (Rating or Named Event Catalogue).  
Enter a description (optional).
- 4 Click **Save**.  
**Result:** The MFile data is replicated and the copied MFile is compiled.



# Adding a Service

## Overview

### Introduction

This chapter explains how to add an Oracle Communications Network Charging and Control (NCC) service.

### In this chapter

---

This chapter contains the following topics.

Service Creation .....	45
Triggering on Service Key .....	46

## Service Creation

### Introduction

After the installation processes, you now have a functional platform which contains all the required components to run the NCC service.

As seen before some services are delivered as template as part of the installation. Those can be used as such with additional minor configuration. That configuration requires some advanced knowledge due to the service complexity.

### Process

Here we shall develop a bit how to create a new service by explaining the different steps. Most of them have been already detailed in this guide, so we shall just refer to them. Here is the step by step service creation.

Step	Action
1	Determine how your service will be triggered, let assume by SK (not an internal service).
2	Create the <i>Service Key</i> (on page 48) entry in <b>SLEE.cfg</b> .
3	Create the <i>Service</i> (on page 48) in <b>SLEE.cfg</b> .
4	Create the <i>Service Entry</i> (on page 48) in <b>acs.conf</b> .
5	Create a <i>Service Provider Creation</i> (on page 9).
6	Create a <i>control plan</i> (on page 6) that will define what the service will be doing.
7	Create a <i>capability</i> (on page 50) for your service use the above control plan as default. For now, you will be able to trigger that control plan for any subscriber If you want to be able to restrict or to customize the action for range of subscriber as example, you'll need to create product types and add subscriber in those product types or have multiple capabilities based on CdPN. To create a product type, you will first need to <i>Rating and Tariffs</i> (on page 31).

Step	Action
8	Create a <i>product type</i> (on page 25).
9	Creating a <i>subscriber account</i> (on page 28) in that product type.

Now you have a service that will be triggered using the same service key, but which could have different behavior, tariff and configuration based on the product type.

## Triggering on Service Key

### Introduction

Most of the time your service will be triggered from the network using an IDP.

That IDP would contain the call information that will be used to trigger your service.

### IDP fields

This table describes the function of each field.

Field	Description
appContext	This holds the value of application-context-name in the TCAP section of the initialDP. Possible values for this parameter include: "0,4,0,0,1,0,50,1" // CAP2 "0,4,0,0,1,21,3,4" // CAP3 "0,4,0,1,1,1,0,0" // CDMAGW
CallingPartyNumber	This specifies the A party number (the subscriber making the call) and is defined in SLPIT in the following format: (NO)A "MSISDN" Some examples include: (2) "200" // Unknown NOA for shortcode dialing (3) "0241497936" // National NOA (4) "64241497936" // International NOA
CallingPartyCategory	This indicates the type of calling party (for example, operator, pay phone, ordinary subscriber). Values are defined in ETS 300 356-1, an ordinary subscriber will be most common.
LocationNumber	This indicates the Location Number for the calling party. This number represents the geographical location of the A party. In a scripted test LocationNumber is often fictional as it is rarely examined in service logic.
Bearer type	The bearer parameters indicate whether the call is voice, video, etc. Some common examples are: bearerCapITC 0 // VOICE bearerCapITC 8 // VIDEO bearerCapITC 24 // VIDEO
EventTypeBCSM	This indicates the BCSM detection point event. This parameter is used in the IDP that begins the call and also in the trigger detection point that ends the call. Trigger detection points are used for both originating and terminating voice traffic. The full list of possible values for this parameter is provided below, with the values relevant to the IDP highlighted in bold:

Field	Description
	<ul style="list-style-type: none"> <li>• <b>origAttemptAuthorized (1)</b></li> <li>• <b>collectedInfo (2)</b></li> <li>• <b>analyzedInformation (3)</b></li> <li>• routeSelectFailure (4)</li> <li>• oCalledPartyBusy (5)</li> <li>• oNoAnswer (6)</li> <li>• oAnswer (7)</li> <li>• oMidCall (8)</li> <li>• oDisconnect (9)</li> <li>• oAbandon (10)</li> <li>• <b>termAttemptAuthorized (12)</b></li> <li>• tCalledPartyBusy (13)</li> <li>• tNoAnswer (14)</li> <li>• tAnswer (15)</li> <li>• tMidCall (16)</li> <li>• tDisconnect (17)</li> <li>• tAbandon (18)</li> </ul>
IMSI	<p>The IMSI is a unique number associated with all GSM and UMTS network mobile phone users. It is stored in the SIM inside the phone and is sent by the phone to the network. The first five digits of the IMSI are identical to the countryCode and networkCode parameters. From the example above:</p> <pre> imsi                "530240100000536" countryCode         "530" networkCode         "24" </pre>
vlrNumber	<p>This specifies the GT of the visitor location register. In scripted tests the most important part of this number is the Country Code prefix. In the example, the subscriber is attached to a New Zealand VLR (Country Code 64):</p> <pre> vlrNumber           (1) "64241420003" </pre>
CellGlobalIdOrServiceAreaIdFixedLength	<p>The parameter in the snoop trace is broken into four parts in the SLPIT script. These parts are extracted following the rule below:</p> <pre> CellGlobalIdOrServiceAreaIdFixedLength ::= OCTET STRING (SIZE (7)) - Refers to Cell Global Identification or Service Area Identification -- defined in 3GPP TS 23.003. -- The internal structure is defined as follows: -- octet 1 bits 4321      Mobile Country Code 1st digit --          bits 8765      Mobile Country Code 2nd digit -- octet 2 bits 4321      Mobile Country Code 3rd digit --          bits 8765      Mobile Network Code 3rd digit --          or filler (1111) for 2 digit MNCs -- octet 3 bits 4321      Mobile Network Code 1st digit --          bits 8765      Mobile Network Code 2nd digit -- octets 4 and 5 Location Area Code according to 3GPP TS 24.008 -- octets 6 and 7 Cell Identity (CI) value or --          Service Area Code (SAC) value --          according to 3GPP TS 23.003 </pre>

Field	Description
	From the example snoop above, the CellGlobalIdOrServiceAreaIdFixedLength is 35F04200023C55, which gives the following fields in the SLPIT script: countryCode "530" networkCode "24" locationAreaCode 0020 cellID 50005
callreference	This parameter refers to a call reference number allocated by a call control MSC. This is unused in the call plan, so any previously used callReference can be used. callreference "1E1B7CE329"
mscAddr	This specifies the GT of the mobile switching subsystem (MSC). In scripted tests the most important part of this number is the Country Code prefix. In the example, the subscriber is attached to a New Zealand MSC (Country Code 64): mscAddr (1) "64241420003"
CalledPartyBCD Number	This specifies the B party number (the number dialed on the handset) and is defined in SLPIT in the following format: calledPartyBCDNumber (8) "0241499216" numberPlan 1

## Service Key

When the IDP arrives on the platform it would contain an SK. This can be used to trigger the service. This is done using a mapping in the **SLEE.cfg** configuration file as follows:

The CCS\_HPLMN\_MO service is attached to service key 102, which is included in the file in a decimal and hex format as below:

```
SERVICEKEY=INTEGER 102 CCS_HPLMN_MO
SERVICEKEY=INTEGER 0x19200000015 CCS_HPLMN_MO
```

Refer to *SLEE Technical Guide* for more information about Service Key definitions.

## Service

This service is mapped to CCS\_HPLMN\_MO by the following line in **SLEE.cfg**:

```
SERVICE=CCS_HPLMN_MO 1 slee_acs CCS
```

Refer to *SLEE Technical Guide* for more information about Service definitions.

## Service Entry

In this example, the CCS service is triggered for mobile originating voice calls as the CCS service library is used to load the service. The Service Entry in **acs.conf** appears as below:

```
ServiceEntry (CCS,cCANLan1,lLcCaAnN,ccsSvcLibrary.so)
```

Refer to *ACS Technical Guide* for more information about Service Entry definitions.

## CCS Capability

The CCS capabilities are defined in the Service Management screen, **Capability** tab.

Service Management

Service Provider: Boss

Help

Number Translation List | Splash Screen Configuration | Security

Exchange Rates | Global Configuration | Balance Type Mapping | Barred List

MFile Generation | Resource Limits | **Capability** | Domain | Currency | Currency Code

Name	Service
ACS_Notification	ACS_Notification
BPL	CCS_BPL
Callback	USSDCB_BLeg
Callback (A-leg)	USSDCB_ALeg
Calling Card	CCS
HPLMN MO	CCS
IVR Self Care	CCS
NGN	NGN
NGN SMSMO	NGN_SM_MO
SMSMO	CCS_SM_MO
USSD Balance Status	USC
USSD Self Care	USC
USSD Voucher Recharge	USC
VPLMN MO	CCS_VPLMN_MO
VPLMN MT	CCS_ROAM

New Edit Delete Close

For example, **Prepaid Charging > Service Management > Capability**.

### Creating a capability

Follow these steps to create a capability.

Step	Action
1	On the <b>Capability</b> tab, click <b>New</b> . <b>Result:</b> You see the New Capability screen.
2	In the <b>Name</b> field, enter the name to use to identify the capability.
3	In the <b>Service</b> field, enter name of the service for the capability.
4	In the <b>Called Party Number</b> field, optionally enter the CdPN prefix (so that the capability is called only for those terminating numbers).
5	Select the <b>Default Control Plan</b> from the drop down list (that can be overwritten in the product type if set).
6	From the <b>Statistics Category</b> drop down list, select the service to count calls through this capability against in a license report.
7	From the <b>Statistics Protocol</b> drop down list, select the protocol to count calls through this capability against in a license report.



Step	Action
------	--------

9

**New Capability**

Help

Name: HPLMN MO

Service: CC5

Called Party Number:

Default Control Plan: Postpaid ...

Statistics Category: Voice

Statistics Protocol: CAP2

Bearer Capability:

CDR Type:

Save Cancel

10

Click **Save**.

**Warning:** You must restart the SLEE in order for the changes to take effect. For more information about restarting the SLEE, see *SLEE Technical Guide*.



## Overview

### Introduction

This chapter explains the tools to use for testing calls and provisioning the service.

### In this chapter

---

This chapter contains the following topics.

Basic SLPIT .....	53
Provisioning Interface .....	58

## Basic SLPIT

### Introduction

Oracle Communications Network Charging and Control IN Applications ‘talk’ a common language – a subset of CS1-INAP known as G8-INAP. Using this common language, IN Applications can be created that focus on functionality without worrying about the lower-level language(s) spoken by the telephony network(s). To cater for the many different protocols and languages implemented in the physical telephony network Interfaces are designed and/or implemented. The interfaces are responsible for communicating with the physical network in whichever protocol the network demands. They translate the messages from the physical network into G8-INAP so that the applications can understand what is going on (The advantage to this approach is that the applications are portable and plug-able to any network, as long as an effective interface can be implemented). The passing of messages back and forth between the applications and the interfaces takes place in the SLEE, where it is possible for many interfaces to be communicating with many applications concurrently. So, where does the SLPIT test tool fit into this picture?

The functional testing of Oracle Communications Network Charging and Control (NCC) applications, using the SLPIT (Service Logic Program Instance Tester), can be done without concern for the protocol of a given network. As long as the application provides the correct functionality in G8-INAP it can be assumed that it will perform the same way on a given network with the appropriate interface(s).

SLPIT is a testing tool which is capable of sending and receiving G8-INAP messages across the SLEE from the application under test. SLPIT communicates with the application through the SLEE, just like a regular interface. It ‘receives’ messages from a text file script rather than a real network and sends these messages through the SLEE as G8-INAP. It then ‘parses’ the responses from the application under test, comparing them to the responses expected by the script. From the perspective of the application under test, SLPIT is a real interface converting the network messages to and from G8-INAP.

The main advantage that SLPIT provides is the ability to effectively test IN applications without the need for a physical telephony network, or a low-level network specific test tool.

The main disadvantage with SLPIT is that it is not a real network, and so the quirks and variation between networks and their protocols is not simulated.

SLPIT acts as a TCAP interface to trigger Intelligent Network platform service logic, instead of using a 'real' Service Switching Point (SSP). SLPIT supports the following IN protocols: CAP, MAP, SCCP, GPRS and IS41.

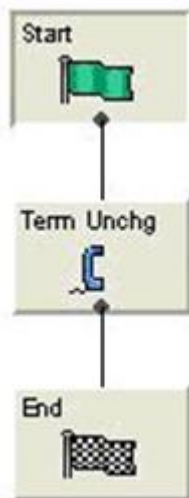
You can view supported protocols using the `-h` option when running SLPIT.

## Basic SLPIT script

Log in to the SLC *hostname\_of\_SLC* using the user account: `acs_oper`. This will place you in directory: `/IN/service_packages/ACS`

To test that everything is set up and working, run a basic SLPIT script against the control plan you created in a previous exercise.

Step	Action
1	<p>Create the following script and name it <code>acs_basic.slp</code>. Save the script in the scripts directory of your backup area.</p> <pre> define call basic { // replace Destination No. (DN) below with your customer's service number DN ?= "015111111" CLI ?= "0139411111" send {   initialdp   calledpartynumber DN   callingpartynumber CLI   callingpartyscategory 10   locationnumber CLI   eventtypebcsm analyzedinformation } receive {   continue } } startcall basic using once </pre>
2	<p>Test the <code>acs_basic.slp</code> script against the control plan shown below (you might need to create it and assign it to your customer's service number first).</p>



**Note:** The Terminate Unchanged feature node indicates that the call should commence without changing the calling party number.

Your SLPIT script should expect to receive `continue` from the SLC.

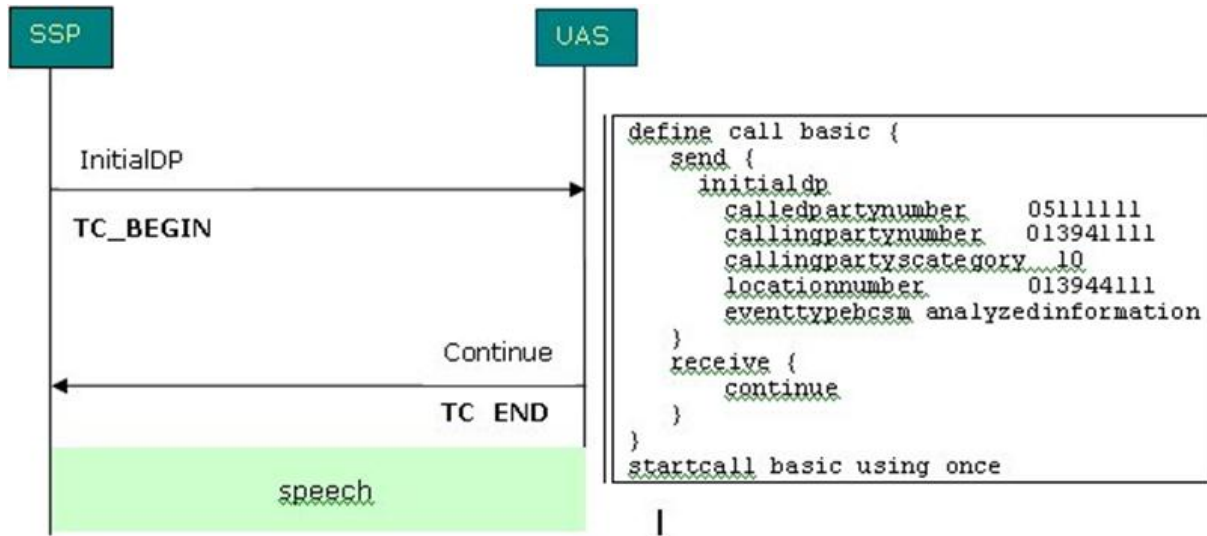
Step	Action
3	<p>Place your script in: <code>/volA volB/training/your_LDAP_id/scripts</code></p> <p><b>Note:</b> The calledpartynumber (Dialed Number) should relate to the service number of your customer. Although this script will succeed even with a non-existent service number, as the default will be to continue.</p>
4	<p>Run the script:</p> <ul style="list-style-type: none"> <li>In one terminal window - start 'tailing' the <code>slee</code> acs log file:  <pre>\$ tail -f /IN/service_packages/ACS/tmp/slee_acs_your_LDAP_id.log</pre> </li> <li>In another terminal window, run the SLPIT script. Remember to set your <code>SLEE_FILE</code> if required, then run the script and look at the output:  <pre>\$ slpit -v -k 111 &lt; acs_basic.slp</pre> </li> </ul> <p><b>Note:</b> The Service Key (-k) for ACS is 111 and for CCS it is 1. You will be using 111 throughout this workbook (see <code>SLEE.cfg</code>)</p> <p>The outcome should be Successful, for example.:</p> <pre>Call success summary: call type basic Calls Run: 1 Calls Succeeded: 1, 100.00% Calls Failed: 0, 0.00% Calls Aborted: 0, 0.00% Total duration in call processing 0 seconds. Call rate based on that is Inf CAPS.</pre>
5	<p>Try running SLPIT without <code>-v</code> and also with <code>'&gt; acs_basic.out'</code>, for example:  <pre>slpit -v -k 111 &lt; acs_basic.slp &gt; acs_basic.out</pre></p> <p><b>Note:</b> You will be looking at the contents of a basic script in the next task.</p> <p>If the script failed:</p> <ol style="list-style-type: none"> <li>Create the above control plan and assign it to your customer's service number. Then schedule the control plan to run against your customer's service number.</li> <li>Alter the calledpartynumber in the SLPIT script to reflect this change and retest.</li> </ol> <p>If you have no luck getting the basic script to work, please see your trainer or mentor, indicating what checks you have already made. Failure to run a SLPIT script could indicate that there is a server configuration problem.</p>

## Analyze a basic script

Open your `acs_basic.slp` from your backup area: `/volA | volB/training/your_LDAP_id/scripts/`.

This is a very basic script that currently emulates making a call to a service number (setup earlier) and then passes control back to the Service Switching Point (SSP) with no database lookup or change to the calling number. For this script, the calling party number (CLI) can be anything.

The call represented as a call flow.



You will see in one example variables have been defined to hold the called and calling party numbers, but you can also just specify them directly if you choose:

```

...
initialdp
calledpartynumber 0151111111
callingpartynumber 0139411111
callingpartyscategory 10
locationnumber 0139411111
...
    
```

Remember when testing your scripts, set your SLEE\_FILE. Run the script and look at the output:

```

$ cd /volB/training/your_LDAP_id/scripts
$ slpit -v -k 111 < acs_basic.slp > acs_basic.out
    
```

### Description of the script acs\_basic.slp

This table gives you a description of each part of the script.

Script	Description
define call basic {	This is the start of the script definition and names it basic and uses { to define the start of the call.
DN ?= "0151111111" CLI ?= "0139411111"	DN is the Destination / called phone number and CLI is the Calling Line Identifier. A value assigned using ?= is used to specify default values for a variable. If a value is assigned using =, this will take priority over one with ?=. So DN = "015122222" and DN ?= "015111111". If the first DN was then blanked out, the second DN (?=) would be used.
Send {	Send defines the data to be sent to the IN platform. The start of the send message block is defined using {.
Initialdp	The SLC expects to receive an Initial Detection Point containing called and calling numbers. The InitialDP procedure (with parameters, for example required data) is sent by the service switching function (SSF) after trigger detection point TDP-R in the basic call state model to request for instructions to complete the call. This is referred to as the "Waiting for instructions" state.
Calledpartynumber DN	The calledpartynumber refers to the called party in the forward

Script	Description
	direction
Callingpartynumber CLI	The callingpartynumber refers to the calling party number signaling information
Callingpartyscategory 10	Callingpartyscategory indicates the type of calling party, for example. operator, pay phone, ordinary subscriber, etc. This information is in standards document Q764E. Category 00000010 = operator, English language. Code 00001101 is used for a 'test call'.
Locationnumber CLI	Locationnumber is used when callingpartynumber does not contain any information about the geographical location of the calling party, for example origin dependent routing when dealing with a mobile subscriber
Eventtypebcsm analyzedinformation }	eventtypebcsm specifies the type of event that is being reported. For analyzedinformation it will contain the calledpartynumber. The end of the send message is defined using }.
Receive {	Receive defines what will be received from the SLC. The start of the receive message block is defined using {.
Continue }	Continue returns control back to the SLC without changing the destination number. Connect would change the dialed number. The end of the receive message block is defined using }.
} startcall basic using once	The end of the call block is defined using }. This runs the script block named basic. <b>Note:</b> Instead of running it once, you can call a script several times using <code>startcall id using uniform delay count</code> , for example <code>startcall basic using uniform 0.5 10</code> , runs the call every 0.5 seconds 10 times (for delay you must specify a number with a decimal point). Try this if you wish and base your new script on edited version of <code>acs_basic.slp</code> , for example name it <code>acs_basic_delay.slp</code>

SLPIT scripts are based on the sending and receiving of INAP messages. You can find details of each message by searching the INAP standards (for example CS-2, CAMEL).

Refer to the INAP standards document for details of INAP messages, for example initialDP.

## SLPIT script for UATB node

To test that your product type calls the correct control plan and runs as expected, write a SLPIT script. The SLPIT script will test the Universal Attempt Terminate with Billing node. If you completed Induction Volume 1, you will notice that this script is similar to the script used to test the conditional terminate node. You will also need to add a receive statement to apply charging. See the *SLPIT User's Guide* for more information.

Example Script - your script can be based on the following example:

```
define call ccs_uatb {
  send {
    initialdp
    appContext "0,4,0,0,1,0,50,1"
    calledpartynumber "441394100005"
    callingpartynumber "441394100009" // change this to your subscriber's number
    callingpartyscategory 10
    eventtypebcsm analyzedinformation
  }
}
```

## Chapter 7

```
// The maxDuration parameter tells the switch the maximum time permitted before//
the next reservation request should be sent to the SCP
receive {
  applycharging
  maxDuration 2400
  release 0
  tone 0
  requestreportbcsmevent
  eventtypebcsms oCalledPartyBusy (2)
  eventtypebcsms oNoAnswer (2)
  dpspecificcriteria applicationtimer 10
  eventtypebcsms oAbandon (1)
  eventtypebcsms RouteSelectFailure
  eventtypebcsms oDisconnect monitormode interrupted (2)
  eventtypebcsms oDisconnect monitormode notifyAndContinue(1)
  connect destroutingaddr "441394100005"
}

send {
  eventreportbcsms
  eventtypebcsms oDisconnect miscallinfo request (1)
  // The timeNoTariffSwitch parameter tells the SLC how long to charge for in
  deciseconds
  applychargingreport
  receivingSide 2
  timeNoTariffSwitch 1200
  callActive 1
}
}
startcall ccs_uatb using once
```

Please do not run your script yet. You will first create and check your environment.

# Provisioning Interface

## Introduction

The Provisioning Interface (PI) provides a mechanism for manipulating data in the NCC solution using an API. It enables bulk or scripted changes to SMF data, where it would be inefficient or more prone to errors for an operator to do so using the Java administration screens.

The provisioning interface uses TCP/IP based Unix sockets to receive commands and parameters that are effectively translated into SQL commands to update the application tables on the SMF database. The PI supports the querying, addition, deletion and modification of database records. It is used by many operators to integrate database-driven software with an existing customer care solution or a web front end.

The PI can be used to provide access to the billing engine for customer care operators or by the operator to enable web based self-care for their customers.

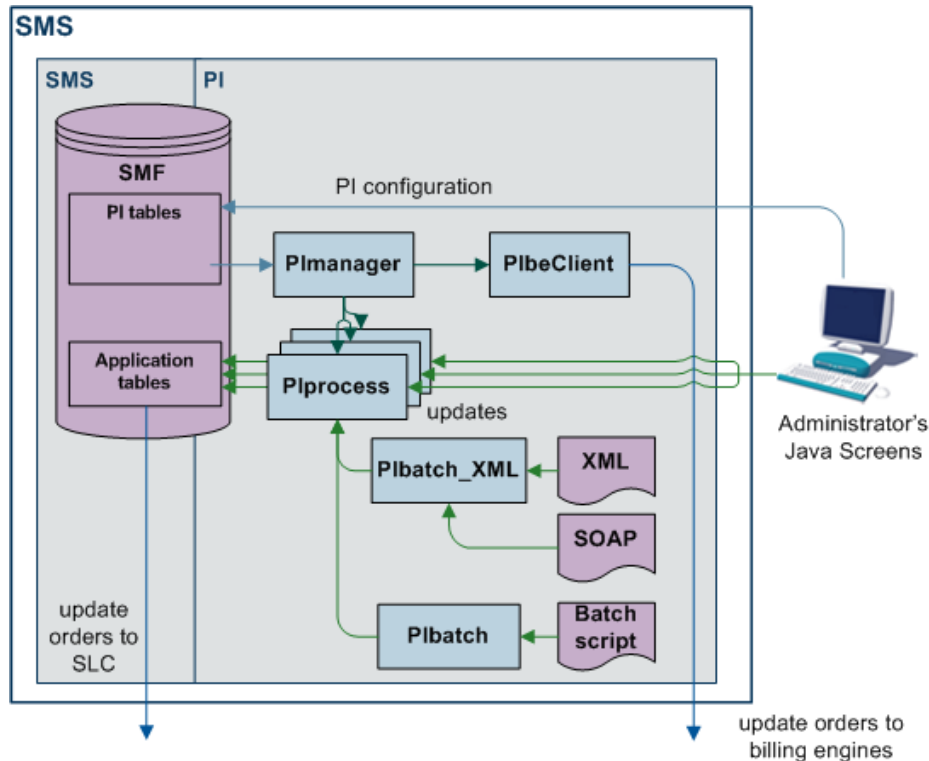
It is a reliable, extensible, network-aware interface based on interoperability standards.

Security on the provisioning interface is achieved by allowing only recognized hosts the ability to connect. For this a username and password is required and checksums are used within the dialogs to ensure messages are not modified or additional messages are not added to the information. The first task you need to perform if you wish to use PI is to configure your PC to access the service. This exercise takes you through the necessary steps in order to set this up.



## Component diagram

This diagram shows the PI components and processes.



## Process descriptions

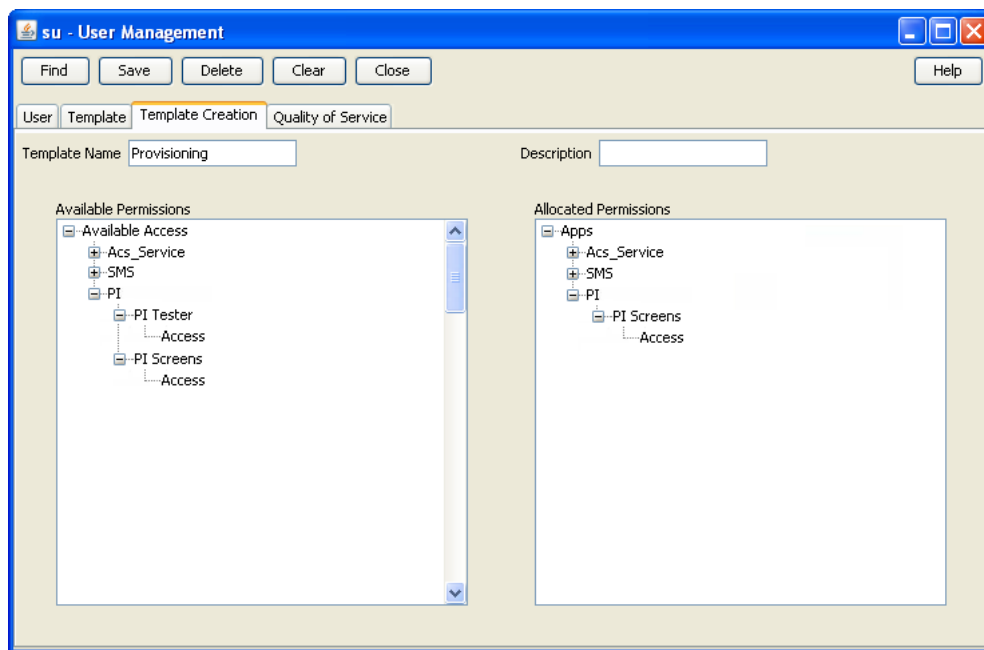
This table describes the processes involved in the PI application.

Component	Description
PIprocess	Updates the SMF database and the SMS sends the data through replication to the other nodes in the network. PIprocess waits for TCP/IP connections and processes commands sent to it. Commands are processed through a shared library or by executing a PL/SQL function in the SMF database.
PIManager	Stops and starts the PIprocess. PImanager is started by init - you should find an entry in <code>/etc/inittab</code> called <code>pim1</code> . The log file for this command can be found at <code>/IN/service_packages/PI/tmp/PImanager.log</code> You can restart PI in two ways: <ul style="list-style-type: none"> <li><code>/IN/service_packages/PI/bin/PIreread.sh</code> - re-reads SMF database when all connections have been dropped.</li> <li><code>/IN/service_packages/PI/bin/restart.sh</code> - terminates PImanager and all PIprocesses, which are then restarted by <code>/etc/inittab</code>.</li> </ul>
PIbatch	Allows multiple PI commands to be sent to PIprocesses through a script file: <code>/IN/service_packages/PI/bin/PIbatch script server</code> Results are placed in a file of the same name but with a <code>.result</code> extension.

## Configuring user access to PI screens

Follow these steps to configure access to PI screens for a specified user.

- | Step  | Action  |
|---|---|
| 1   | Open the SMS user interface (UI) from an internet browser by entering the following url:<br><code>http://SMShostname/sms.jnlp</code><br>Where <i>SMShostname</i> is the hostname of an SMS in the IN.                                       |
| 2   | Log in to the SMS UI as the systems administrator (for example by logging in as the user su).   |
| 3   | Select <b>User Management</b> from the SMS <b>Operator Functions</b> menu.  |
| 4   | Find the user to whom you want to give PI permissions by clicking <b>Find</b> , and then <b>Search</b> .  |
| <p><b>Tip:</b> Leave the <b>User Name</b> field empty to find all users. To find a specific user, specify the first few letters of the user's name.</p> |   |
| 5   | Select the user you want and click <b>Close</b> .   |
| 6   | On the <b>Template Creation</b> tab, select the <b>PI</b> group (including <b>PI Screens</b> and <b>PI Tester</b> ) from the list in the <b>Available Permissions</b> area and drag and drop them to the <b>Allocated Permissions</b> area. |



- 7 Click **Save**.
  - 8 Click **Close**.
- The specified user now has the ability to administer the PI through the PI UI.

## Configuring User and PC Connection to PI

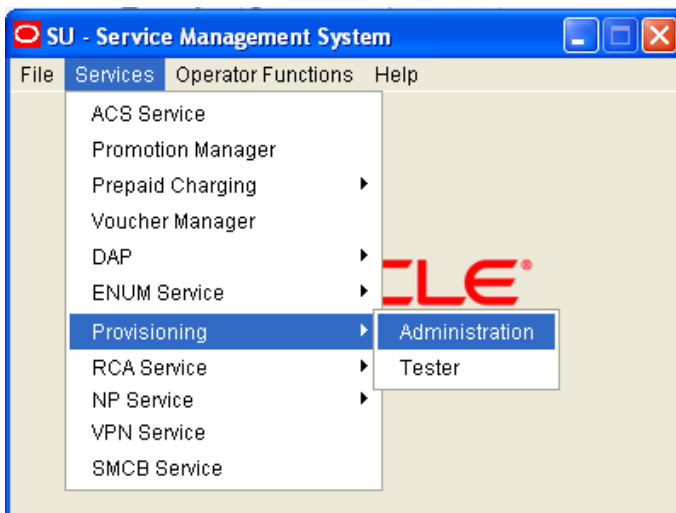
Follow these steps to configure personal computer (PC) connection details to the PI for a specified user.

Step	Action
------	--------

- 1 Open the SMS UI, and log in as the user who requires a PC connection to the PI.

**Note:** The user should already have screens access to the PI configured. For more information, see *Configuring user access to PI screens* (on page 60).

- 2 Select the **Administration** option from the SMS **Services, Provisioning** menu.



- 3 On **Hosts** tab, click **New**.

The PI Hosts window is displayed.

- 4 In the **IP Address** field, enter IP address of the PC.

**Tip:** You can find the PC IP address by using the ipconfig command in a CMD window or by entering if config from a UNIX terminal.

- 5 On **Users** tab, click **New**.

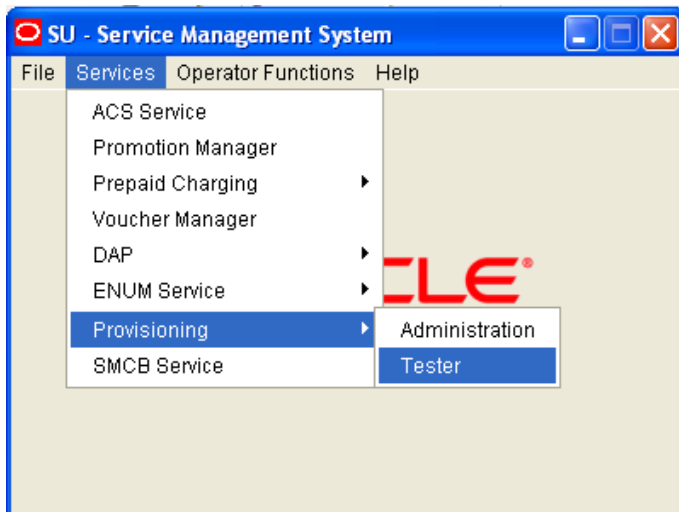
The PI Users window is displayed.

Step	Action
6	Enter the SMS user details for user who will be using the PC. You must allocate security level 99 to the user in the <b>Security Level</b> field.
7	Restart the PI to activate the changes by performing the following steps: <ol style="list-style-type: none"> <li>Log in to the SMS as the smf_oper user.</li> <li>Go to the following directory: <b>/IN/service_packages/PI/bin</b></li> <li>Check the owner of the <b>PIrestart.sh</b> file and su to this user.</li> <li>Restart the PI by entering the following command: <code>-PIrestart.sh</code></li> </ol>

### Testing your User and PC connection

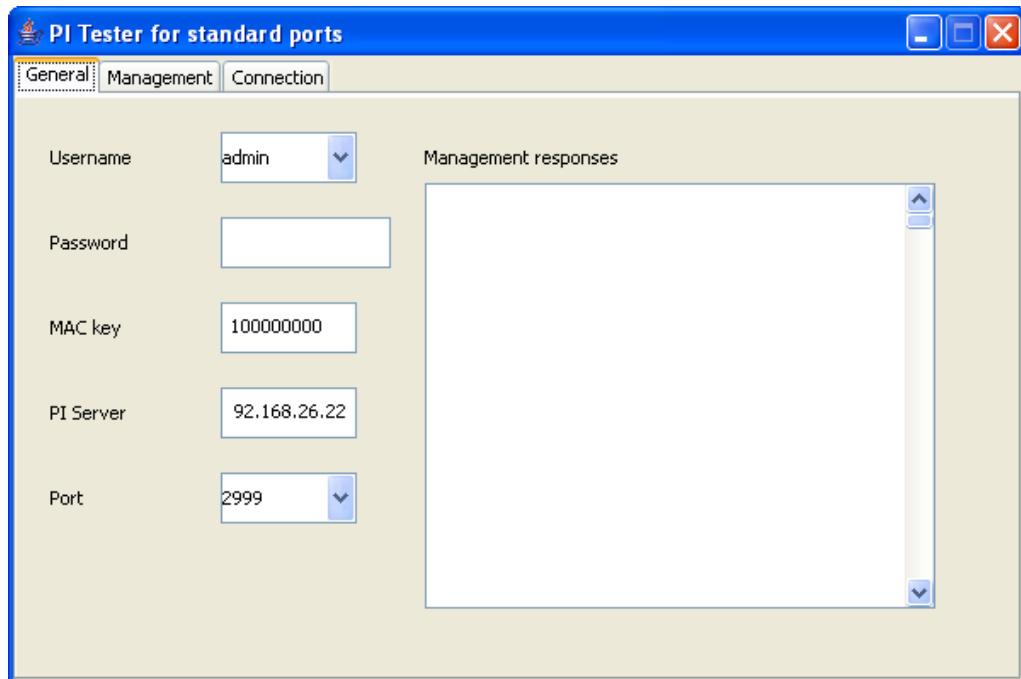
Follow these steps to test your user and PC connection

Step	Action
1	Give PI a moment to restart, then, through SMS: <code>http://hostname of SMS/sms.jnlp</code> , log in as your SMS user. Service Management System -> <b>Services</b> -> <b>Provisioning</b> -> <b>Tester</b> .

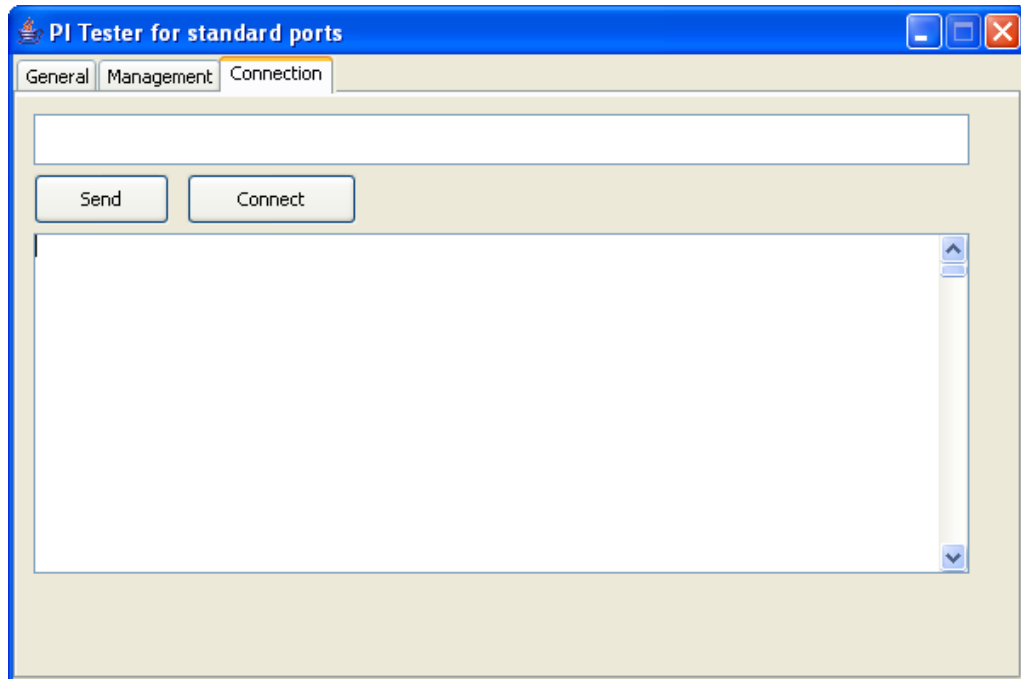


2 On **General** tab, select your username from the drop-down list and enter the password.

Step	Action
------	--------



3 On **Connection** tab, click **Connect**.



**Result:** If connection is:

- Successful the following should be displayed in the Connection window:  

```
>username, *****;  
<ACK, SYNSTAMP=2007041108352386;
```
- Unsuccessful, for example invalid username/password, the following should be displayed in the Connection window:  

```
>username, *****;
```

Step	Action
	<code>&lt;NACK,72-INVALIDLOGON - username,password;</code>

## ACS commands

Go to **Service Management System -> Provisioning -> Administration** to view the list of PI commands available. You will find these in the **Commands** tab.

A list of ACS PI commands and their expected format can be found at *ProjectDrive:\Provisioning Interface (PI)\PI\_v2.6\Design\ACS Product\Commands*

### PI ACS commands

Once you have established a connection to the SMS using PI Tester you should be able to execute the following ACS commands. The command should be entered into the 'command' window (window above the **Send** and **Connect** buttons). PI processes interrogate the timestamp SYNSTAMP at the end of each command and expect this value to be later than the previous timestamp recorded. Therefore, this SYNSTAMP value has to be manually incremented by '1' each time a new command is sent.

#### CSAdd CLI

ACSCLI=ADD – add a CLI

Use this command to add a new CLI to the ACS customer that the specified control plan belongs to.

When you connect to PI, you will receive a SYNSTAMP. copy and paste this and use it as your SYNSTAMP. For each command you issue, increment the number by 1. See an example of the command entered below:

```
ACSCLI=ADD:CLI=01206888888, CALLPLAN=callplan, ALLOWED=1|2|3|4|5, SYNSTAMP=2007041108352387;
```

Try sending some commands where the CLI entered does not exist.

**Note:** It was observed during testing that the only control plans (call plans) that CLIs could be added and related to were those that belonged to the ACS customer 'Boss'.

#### ACS Query CLI (Calling Line Identifier)

ACSCLI=QRY – query an existing CLI, this will return a list of allowed CLIs.

Use this command to perform a database query on one of your ACS customers' CLIs created earlier. See an example of the command entered below:

```
ACSCLI=QRY:CLI=01473666666, SYNSTAMP=2007041108352386;
```

**Note:** If the commands are not present (for some reason), you will get this:

```
<NACK,75-UNKNOWN COMMANDACSCLI=QRY;
```

## CCS commands

### Query Subscriber

CCSCD1=QRY – query a CCS subscriber

Use this command to perform a database query on one of your CCS subscribers created earlier in this induction book. PI commands have mandatory parameters that must be entered and optional parameters that can be entered to gain more information from the database. For this command the mandatory parameter is the subscriber MSISDN. More information may be returned depending on what applications are loaded on the server for example if piWalletSms is loaded onto the server then details of the subscriber's wallet and balances will also be returned. See an example of the command entered below:

```
CCSCD1=QRY:MSISDN=44123457,SYNSTAMP=2007041213581396;
```

The response should be similar to this:

```
<CCSCD1=QRY:ACK:MSISDN=44123457,ACCOUNT_NUMBER=1044123457,PRODUCT=PT1,SERVICE_PROVID
ER=Boss,STATUS=A,CREATION_DATE=20070131175807,WALLET_EXPIRY_DATE=,BALANCE_EXPIRY_DAT
E=20070904165847,BALANCE=56815,INITIAL_BALANCE=100000,LANGUAGE=english,LAST_RECHARGE
_DATE=20070405150304,LAST_CC_RECHARGE_DATE=,LAST_USE_DATE=20070405150230,LAST_RECHAR
GE_AMOUNT=0,PREV_WALLET_EXPIRY_DATE=,PREV_BALANCE_EXPIRY_DATE=,PREV_BALANCE=0,LAST_E
XP_CREDIT=0,TOTAL_EXP_CREDIT=0,LAST_EXP_DATE=20070302231001,FIRST_ACTIVATION
DATE=,LAST_STATE_CHANGE_DATE=20070131180057,LAST_STATE_CHANGE_REASON=,BYPASS_NUMBER=
,WALLET_TYPE=Personal,CHARGING_DOMAIN=5,FFD=,FFN=,FDN=,CUG=,CURRENCY=EUR,SYNSTAMP=20
07041213581396;
```

### Add Friends and Family number

Ensure your subscriber's product type is configured to have Friends and Family numbers. It is set to 0 by default:

Go to **Subscriber Management -> Product Type**. Edit the product type you are querying and select Friends and Family from the list presented on the left hand side. Change Maximum F&F numbers allowed to say, 5.

Check that F&F is activated for the subscriber you are adding F&F numbers for.

To add a number to the Friends & Family list, use CCSCD8=ADD

```
CCSCD8=ADD:MSISDN=44123457,FFNUM=0147322222,SYNSTAMP=2007041213581402;
```

If the number is added to the database successfully the response should be similar to this:

```
<CCSCD8=ADD:ACK,SYNSTAMP=2007041213581402;
```

Verify that new number has actually been added to your subscriber's Friends & Family list using the CCS screens and by querying the database. Did you have any problems adding the new number? You could try to delete the number now.

### Recharge Wallet

Use the CCSCD3=RCH - Recharge wallet command to change the value of a balance within the subscriber's wallet. This command has several mandatory parameters:

- MSISDN – Subscriber number (either MSISDN or Account must be entered)
- ACCOUNT – Subscriber account number (either MSISDN or Account must be entered)
- RECHARGE\_TYPE – Credit or Custom
- REFERENCE – For Custom will be the 'Component' value defined in the Wallet Bonus Type screen
- AMOUNT – Recharge Amount (can be positive or negative)

The command also contains optional parameters which allow the operator to define how the wallet is recharged. Some of the variables are as follows:

- BALANCE\_TYPE – For example General Cash, Promotional, SMS, etc
- WALLET\_TYPE – Which wallet is recharged: Personal or Business
- BALMODE – Type of recharge – Delta or Absolute (default is delta)

If optional parameters are not defined the default values will be used for example default Wallet or default Balance Type as defined for subscriber.

See an example of the command entered below:

```
CCSCD3=RCH:MSISDN=44123457,BALANCE_TYPE=General
Cash,AMOUNT=1700,RECHARGE_TYPE=Custom,REFERENCE=10,MODE=2,
SYNSTAMP=2007041213581402;
```

If the wallet is recharged successfully the response should be similar to this:

```
<CCSCD3=RCH:ACK,SYNSTAMP=2007041213581402;
```

Change to the wallet balance can be verified on the **Service Management System -> Services -> Prepaid Charging -> Subscriber Management -> Edit Subscriber -> Wallet** screen. The CDR/EDR data can also be viewed by clicking on the **View CDRs** button. Different type of CDRs are created for positive (CDR8) and negative (CDR2) recharge values. More detailed information relating to the CDR can be seen in the **beServer.log** file.

Using the optional parameters attempt a number of recharges to your subscriber's wallet(s), applying the recharge to different balance types, positive and negative recharge values and using default and defined parameter values.

### Recharge Bonus

A bonus set and a bonus type can be configured so that if a subscriber recharges their wallet by an amount that falls within the defined criteria they will receive a bonus percentage on top of their recharge amount.

Define a bonus value and then a bonus type using the tabs on the **Service Management System -> Services -> Prepaid Charging -> Wallet Management** screen. On the **Bonus Values** tab create a new bonus set. Define both the recharge range that will generate a bonus and the bonus percentage. Leave the **Voucher Type** field blank. Now create a new bonus type and link it to the bonus set, previously created. Define the balance type to which the bonus will be added. This can be a different balance to the one receiving the recharge. In the **Component** field enter a two character value, for example.12. This value must match the REFERENCE value sent in the PI Recharge command CCSCD3=RCH.

Send the PI command and verify that the recharge occurs successfully. Also verify that if recharge value falls within the defined bonus criteria the subscriber receives a bonus amount added to their defined balance type (view CDRs on Subscriber Management screens).



# Prepaid Charging Service Template

## Overview

### Introduction

This chapter explains the services that are available when you install Oracle Communications Network Charging and Control (NCC) Prepaid Charging Service Template (PCST). For each available service, this chapter will describe the service logic, the components used by the service, and the different configuration possibilities.

### In this chapter

---

This chapter contains the following topics.

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## About Prepaid Charging Service Template

### Introduction

When you install NCC, you have the option to install the following service templates:

- The Prepaid Charging Service Template (PCST)
- The Social Networking Service Template (SNST)

The service templates include service configuration that provides operators with the ability to differentiate themselves from the competitors in the market. This section details the services available in the PCST.

Each PCST service has a priority assigned to it that determines the order in which the services will be traversed during real-time call processing.

If more than one service is applicable to a certain call (for example calling a Friends & Family number from the home zone), then only the discount associated with the service that has the highest priority will be applied.

### Default service provider

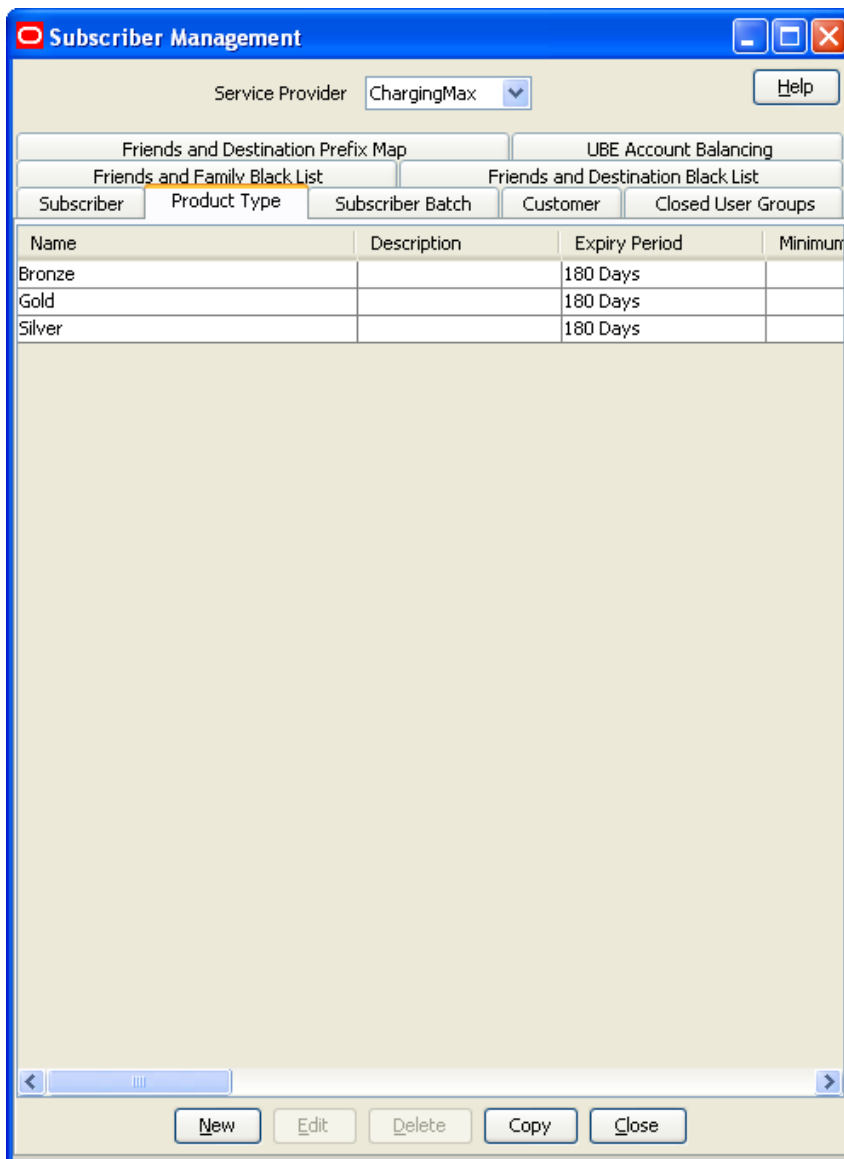
The PCST is delivered with the `OCNCCtemplate` service provider by default.

**Note:** You can specify a different name for this service provider when you install the NCC platform. For more information, see *Installation Guide*.

### Default product types

The PCST is delivered with the following three default product types:

- BRONZE
- SILVER
- GOLD



## Friends and Family

### Introduction

Friends and Family (F&F) is a popular service offered by the majority of mobile phone operators. Subject to the service being included in the product package, the user can receive preferential call rates as soon as they nominate their numbers to be included in the scheme. The operator must define which services will be included in the service such as voice and SMS.

The F&F service begins with the operator dictating which destination numbers are eligible to be included in the scheme. These can be from a variety of prefixes such as on-net, national fixed or mobile numbers.

The operator defines the maximum number of entries in the list and also the level of discount which is given.

By calling customer services or by using self care features, the user can:

- Get information about F&F services
- Activate F&F services
- Define / update F&F numbers

It may take several months before the subscriber is happy that they have selected the appropriate numbers to receive maximum discount, and it is likely that they will change their list more than once. The operator can choose the number of occasions a user can modify his list, without charge. After these have been used, a charge may be applied by the operator for every subsequent change that is made.

If desired by the operator, a reoccurring fee may be applied for subscription to the F&F service. Alternatively, the operator may offer F&F with no periodic fee as a way to attract new customers, or as an offer to current customers that are not subscribed – as a means of brand loyalty / stickiness between customers.

The “Friends and Family” service (FF) allows a subscriber to nominate certain MSISDN numbers as FF numbers. When a call is placed or an SMS is send to any of these numbers, a preferential rate will be applied.

The “Best Friend” service (hereafter referred to as BF) can be seen as an extra service on top of the FF service. However, they are covered/seen as one service is this chapter.

A subscriber can additionally nominate one number as a BF number, whereby a special discount will be applied for voice calls/SMSs to this number.

The operator is able to define:

- Which services will be available to the FF service (Voice, SMS).
- Which type of destination will be eligible for FF nomination (On-net, Off-net, National Fixed, International).
- The maximum number of entries a FF List can consist of.
- The FF discount which will be applied.
- The number of times a subscriber is able to modify his FF list without charge.
- The charge to be applied for a FF List change.
- A recurring fee for the FF service.

A FF Self-Care service is also available. For more information on the FF Self-Care, see Prepaid Charging Service Template - Self Care.

You may view all information relating to Friends & Family through the Customer Care screens, or access through the on-line provisioning interface.

You may be enforce any business logic around charges for changing the numbers using the Customer Care screens.

### Balance Types

The following balance types are used by the FF service.

Name	Type	Units	Usage
FF Free Changes	Charge	SMS	Used as a "Free Changes" counter, to indicate the number of free FF list changes.

Additionally, a "FF Free Changes" balance type cascade is created, which consists of the following balance types:

- FF Free Changes
- General Cash

This balance type cascade is used to charge for a FF list change. As long as the FF Free Changes balance is greater then zero, the FF List change will be regarded as a free change.

### Named Events

The following named events are used by the FF service.

Name	Class	Description
Change Fee	FF	The cost of a FF list change.
Monthly Fee	FF	The recurring cost for the FF service.

### Example Event Set

These events are assigned to a product type specific named event catalogue, where they are overridden.

Prepaid Charging > Rating Management > Named Event Catalogue tab, select a named event catalogue and click **Edit**.

**Edit Named Event Catalogue**

Name: Gold    Include Default (Bronze):     Use Holiday Set: None

**Named Events**

Display Filters:

- Event Sets: All Sets
- Include In Catalogue: Included
- Max Rows: 999
- Event Name:
- Allowed in Catalogue: Allowed & Barred

Event Set	I	Named Event	A	Cash Cost	Time Cost (Secs)	More Info
BOOST	<input checked="" type="checkbox"/>	Boost 1 Periodic Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Boost 2 Periodic Fee	<input checked="" type="checkbox"/>	\$0.20		
	<input checked="" type="checkbox"/>	Boost 3 Periodic Fee	<input checked="" type="checkbox"/>	\$0.30		
	<input checked="" type="checkbox"/>	Boost 4 Periodic Fee	<input checked="" type="checkbox"/>	\$0.40		
	<input checked="" type="checkbox"/>	Boost 5 Periodic Fee	<input checked="" type="checkbox"/>	\$0.50		
CS	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
FD	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
FF	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.20		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
NA	<input checked="" type="checkbox"/>	NA	<input checked="" type="checkbox"/>			
Loyalty	<input checked="" type="checkbox"/>	Point	<input checked="" type="checkbox"/>	\$0.01		

Buttons: View Details, Delete Overrides, Select All

**Named Event Override Configuration**

Event Name:

Override Name	Cash Cost	Time Cost (Secs)	A	General
Change Fee	\$0.10		<input checked="" type="checkbox"/>	Yes

Buttons: New, Edit, Delete, Select All

Buttons: Save, Save and Close, Close

## Control Plans

The following control plans (CP) are used by the Friends and Family (FF) service.

Name	Description
FF IVR - SCP	FF Self-Care logic This CP is called by the overall IVR Self Care CP.
FF Activation – BPL	FF service activation logic (used by BPL)
FF Deactivation – BPL	FF service deactivation (used by BPL)
FF Add – BPL	Add a number to the FF List (used by BPL)
FF Delete – BPL	Delete a number from the FF List (used by BPL)
BF Change – BPL	Set/Change the Best Friend (used by BPL)

Name	Description
HPLMN-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains FF Voice service logic) This CP is called by the Voice CP (HPLMN-MO)
HPLMN-MO	HPLMN-MO control plan, which calls the "HPLMN-MO VAS Service Logic – SCP" CP.
SMS-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains FF SMS service logic) This CP is called by the SMS CP (SMS-MO)
SMS-MO	SMS-MO control plan, which calls the "SMS-MO VAS Service Logic – SCP" CP.
IVR Self Care	Overall IVR Self Care control plan, which calls VAS specific Self Care CPs

## Profile Fields

The following profile fields are used by the FF service.

Name	Type	Tag	Profile Block	Usage
FF Recurring Fee	BOOLEAN	2812001	Global Profile	Defines whether a recurring fee should be applied.
FF Recurring Fee Amount	INTEGER	2812003	Temporary Storage	Amount of the recurring fee charge (used in FF Self-Care control plan).
FF Temp Number	NSTRING	2812005	Temporary Storage	Used during service logic processing.
FF Onnet Allowed	BOOLEAN	2812006	App Specific 2	Defines whether on-net calls and SMSs are allowed.
FF Offnet Allowed	BOOLEAN	2812007	App Specific 2	Defines whether off-net calls and SMSs are allowed.
FF Fixed Allowed	BOOLEAN	2812008	App Specific 2	Defines whether national fixed calls and SMSs are allowed.
FF International Allowed	BOOLEAN	2812009	App Specific 2	Defines whether International calls and SMSs are allowed.
FF Change Fee Amount	INTEGER	2812010	Temporary Storage	Amount to be charged for a FF list change.
FF Temp Entry	INTEGER	2812011	Temporary Storage	Used during service logic processing.
FF List	LOPREFIX	2812014	App Specific 1 App Specific 2	FF list which holds all the FF numbers.
FF Service Active	BOOLEAN	2812015	App Specific 2	Defines whether the FF service is active (product type).
FF Voice Discount	DISCOUNT	2812017	App Specific 2	Discount percentage for FF voice calls.
FF SMS Discount	DISCOUNT	2812018	App Specific 2	Discount percentage for FF SMSs.
BF Number	NSTRING	2815001	App Specific 1	Stores the BF number.
BF Service Active	BOOLEAN	2815002	Global Profile	Defines whether the BF service is active (globally).
BF Temp	BOOLEAN	2815003	Temporary Storage	Used during service logic processing.

Name	Type	Tag	Profile Block	Usage
BF Voice Discount	DISCOUNT	2815004	App Specific 2	Discount percentage for BF voice calls.
BF SMS Discount	DISCOUNT	2815005	App Specific 2	Discount percentage for BF SMSs.

## Notifications

The following notifications are used by the FF service.

Field	Notification text
FF Disabled	Your F&F service has been disabled.
FF Extended	Your F&F service has been extended.
FF Grace	Your F&F grace period has started.

**Note:** Only the English text is present in the table above. Other languages will also be present on a standard NCC installation.

These notifications are used as periodic charge notifications.

## Recharge types

The following recharge types (RT) are used by the FF service.

Field	Usage
FF Free Changes	This RT is used to reset the "Free Changes" counter.

## Business Process Logic

The following BPLs are used by the FF service.

Field	Description
FFADD	Add a number to the FF List.
FFACT	Activate the FF service for the subscriber.
FFDEL	Delete a number from the FF List.
FFDACT	Deactivate the FF service for the subscriber.
BFCHG	Change the best friend number.

## Periodic Charges

The following periodic charge (PC) is used by the FF service.

Name	Usage
FF	<p>This PC determines whether the user has subscribed to the FF service and performs two operations, every month:</p> <ul style="list-style-type: none"> <li>Reset FF free change counter</li> <li>Debit FF periodic fee</li> </ul> <p>This PC is assigned to all CPS product types.</p>

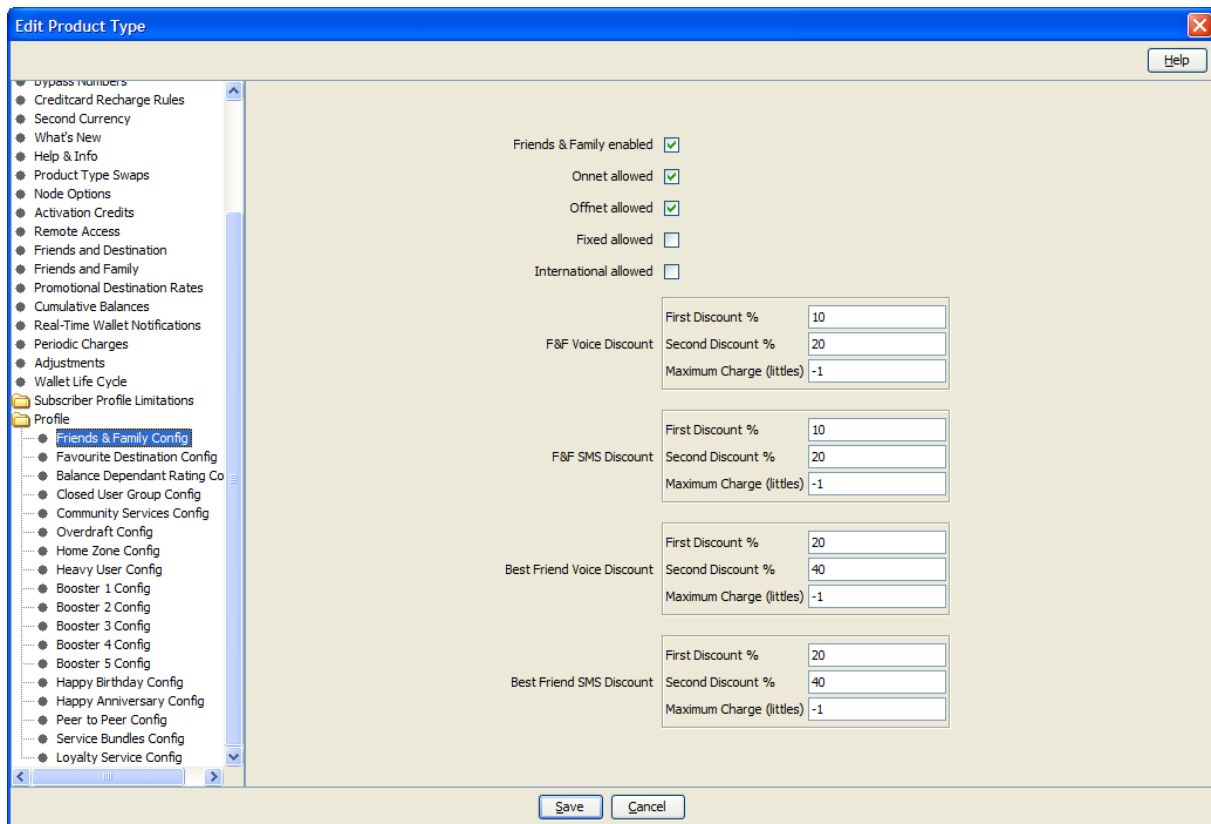
## Screens

The FF service uses two SPM custom screens:

- Product Type
- Subscriber

### Product Type screen

Here is an example screen.





## Subscriber screen

Here is an example screen.

## Screens Template access

A standard NCC installation creates access rights for the custom FF screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

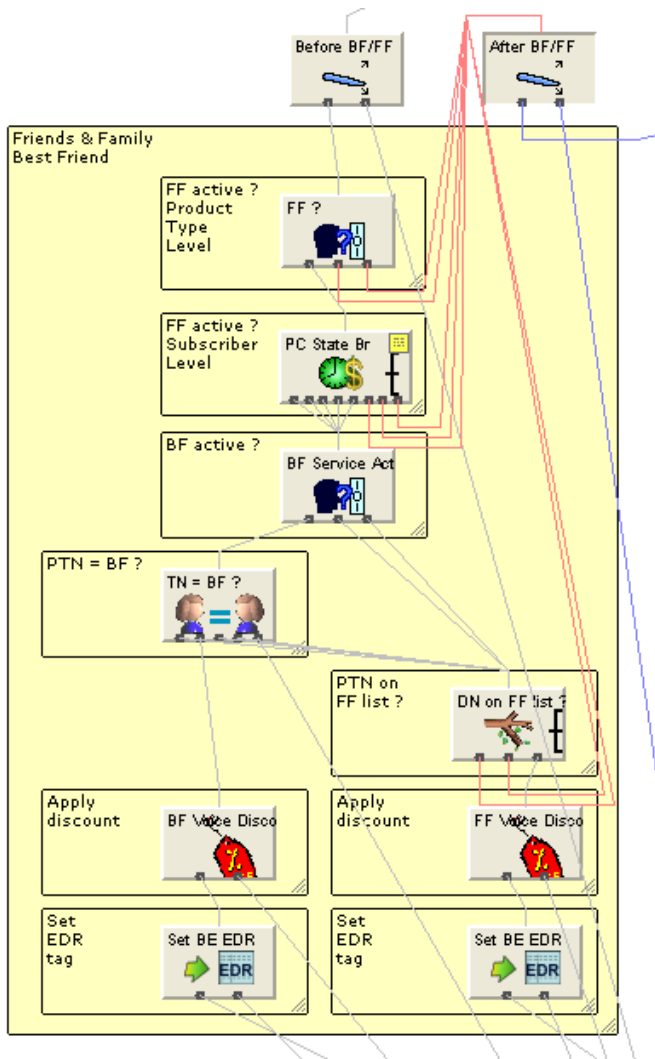
## Service Logic

As with all VAS services, the Voice and SMS control plans each have a "VAS Service Logic" sub control plan, called respectively:

- "HPLMN-MO VAS Service Logic – SCP"
- "SMS-MO VAS Service Logic – SCP"

These "VAS Service Logic" control plans contain the service logic for this service, and are only used for HPLMN-MO and SMS-MO capabilities.

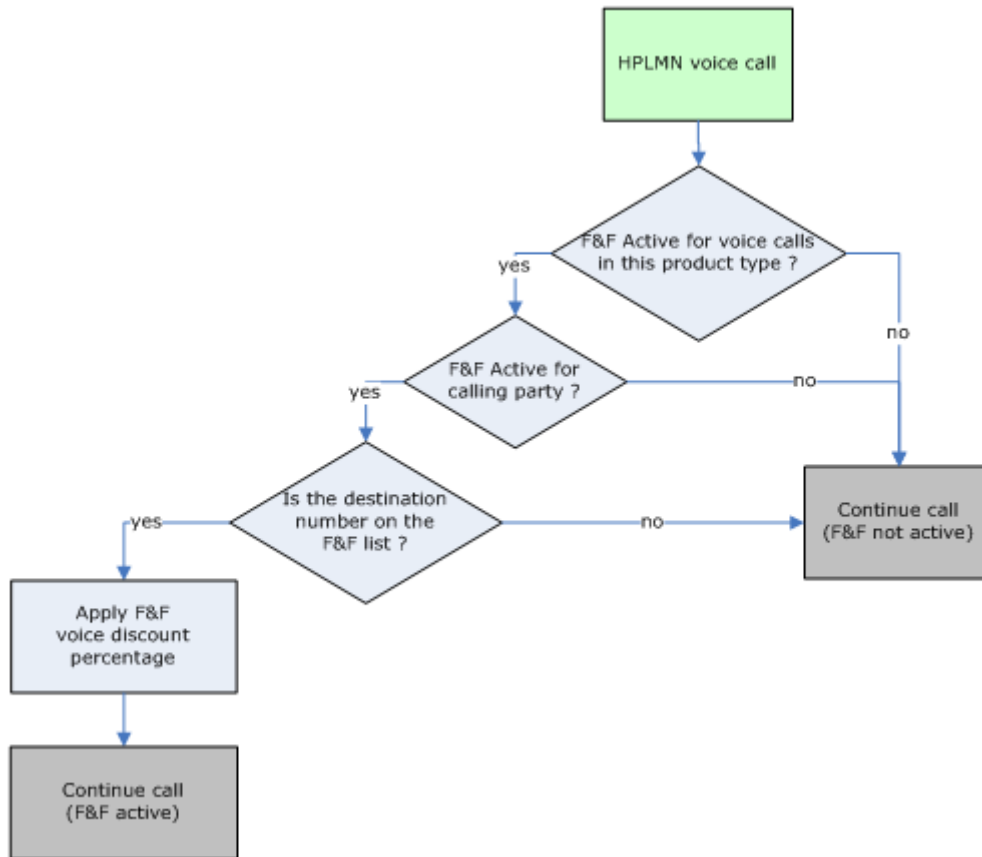
The Voice and SMS FF service logic is identical and looks like this:



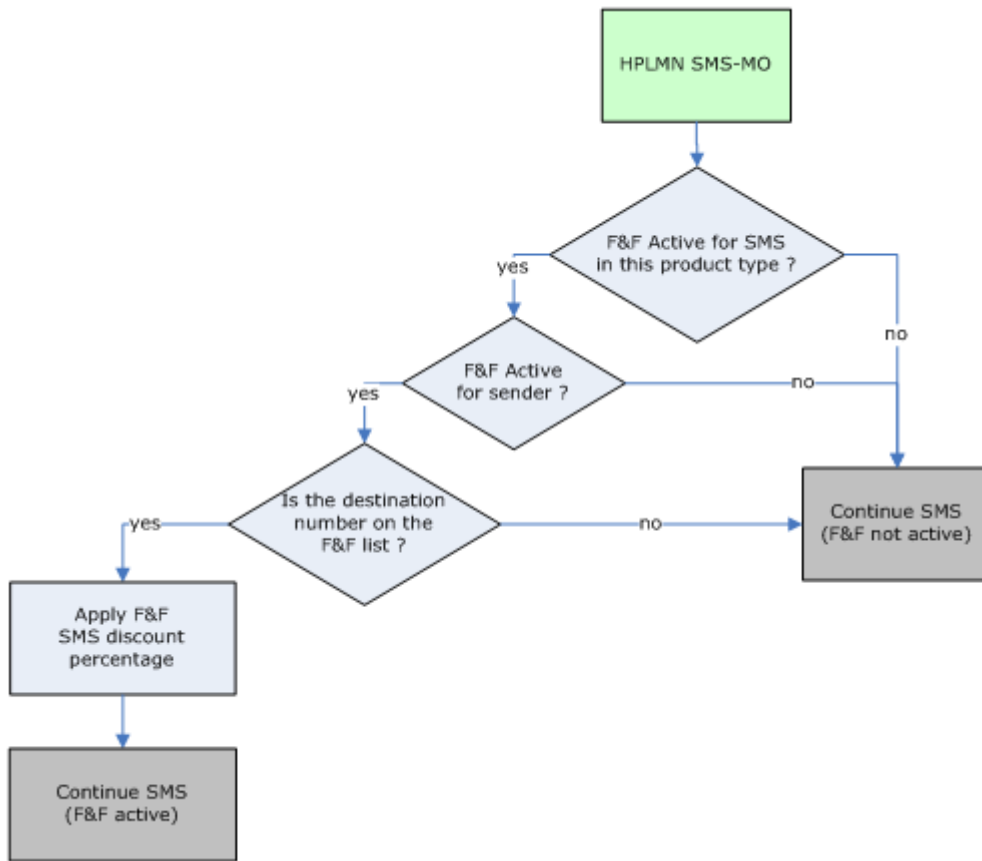
## Flow charts

The flow charts below provide more information on how the F&F service functions for the different call scenarios.

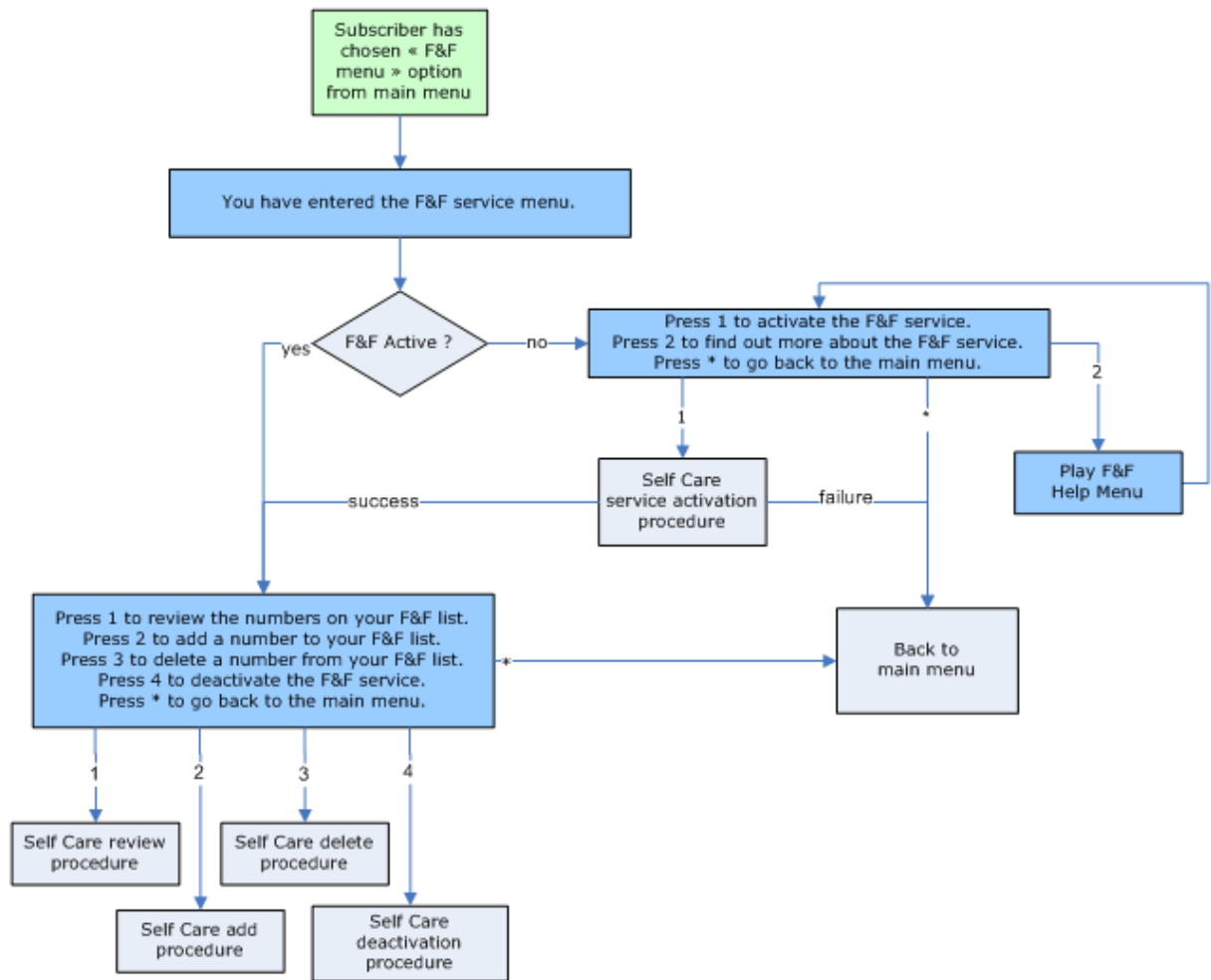
## HPLMN Voice



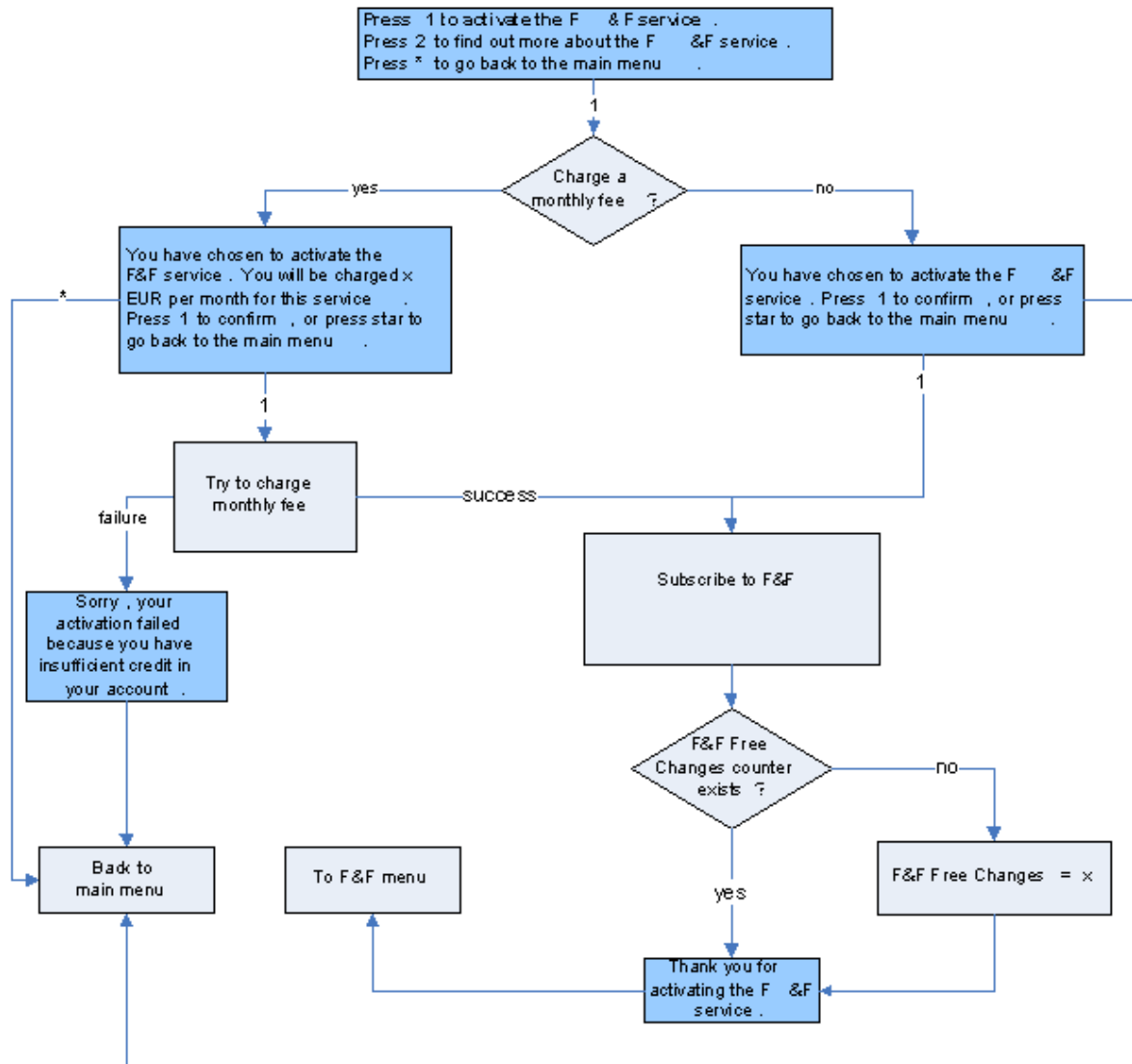
HPLMN SMS-MO



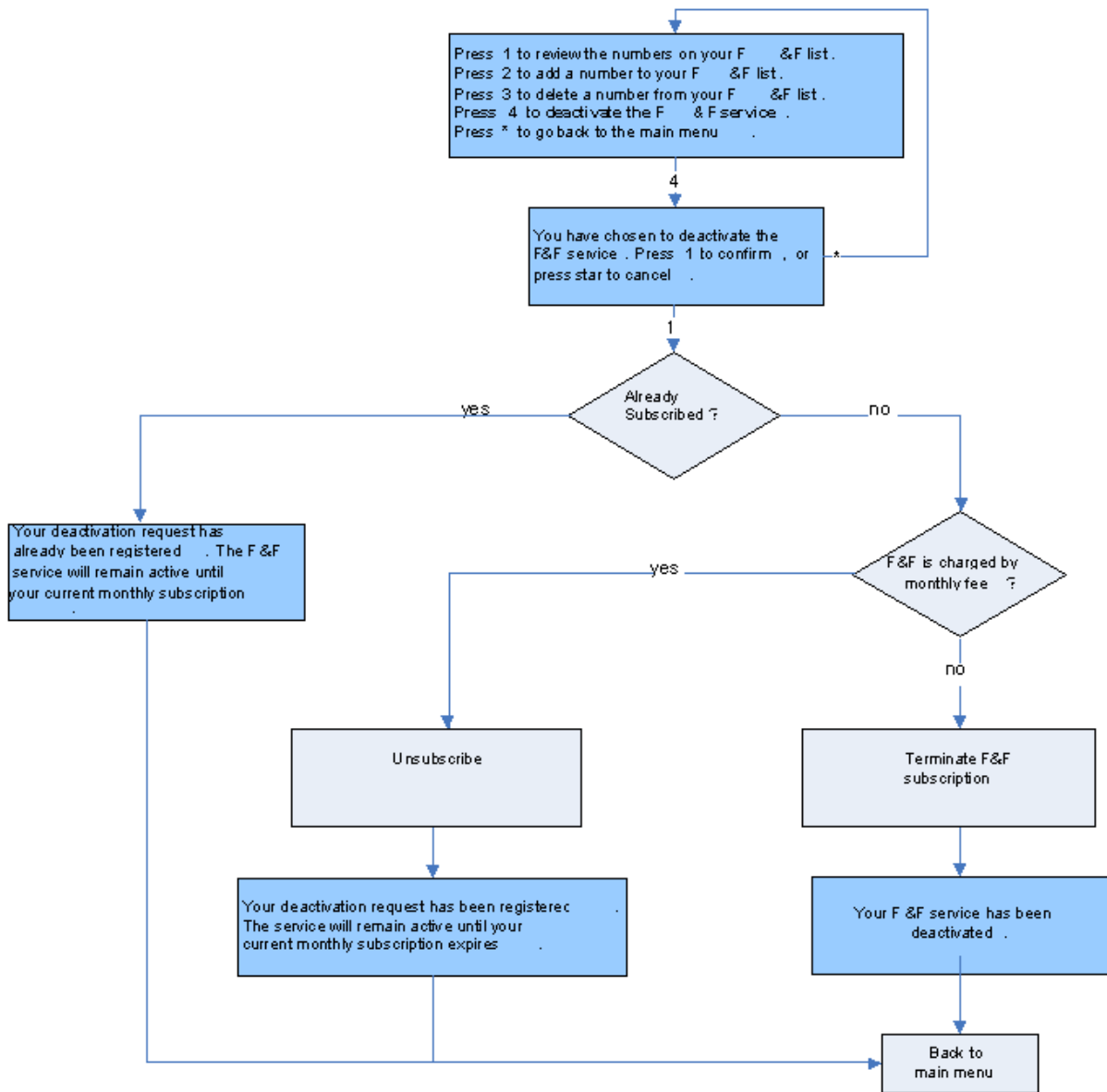
Self Care



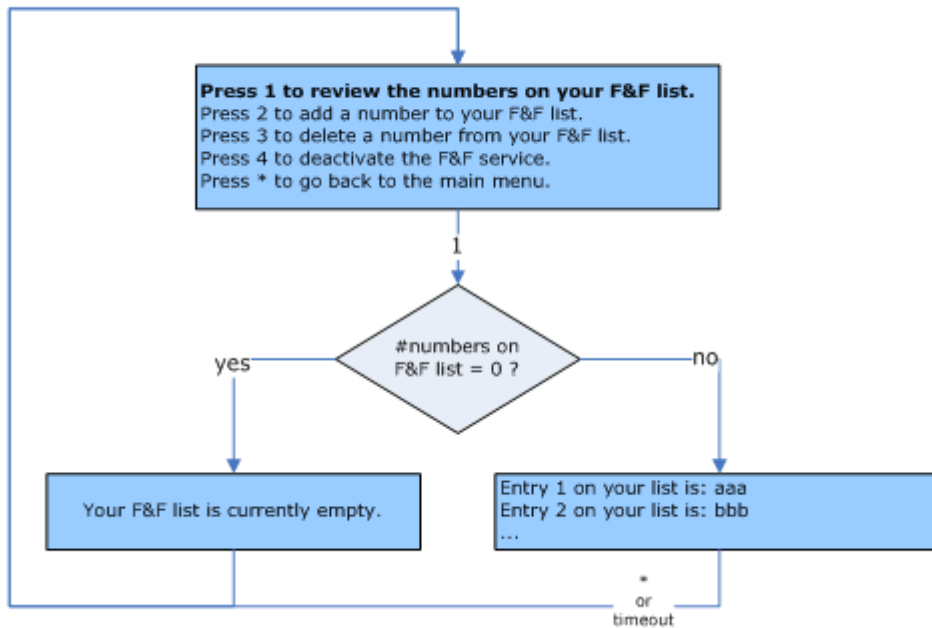
Service activation



Service de-activation

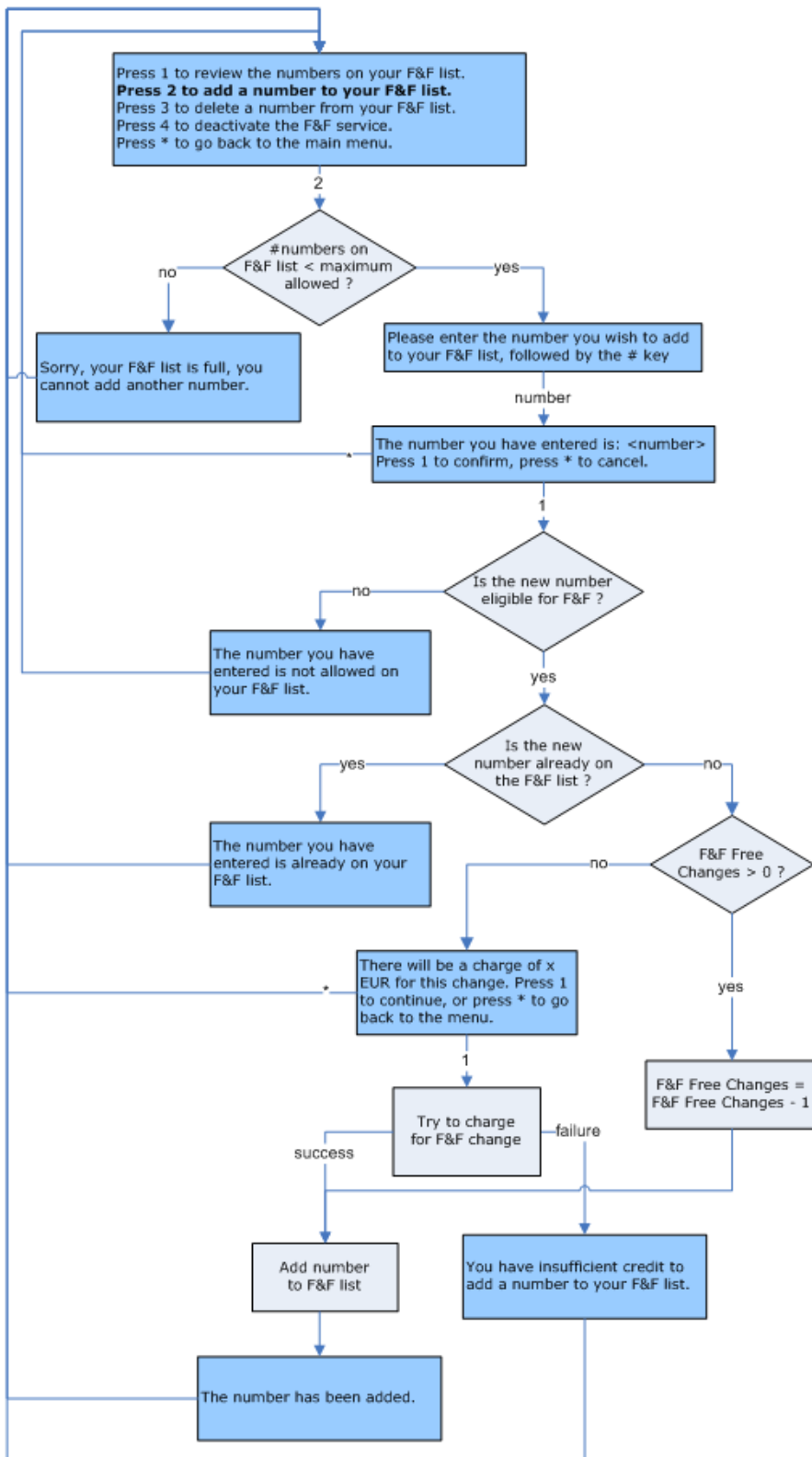


Service de-activation

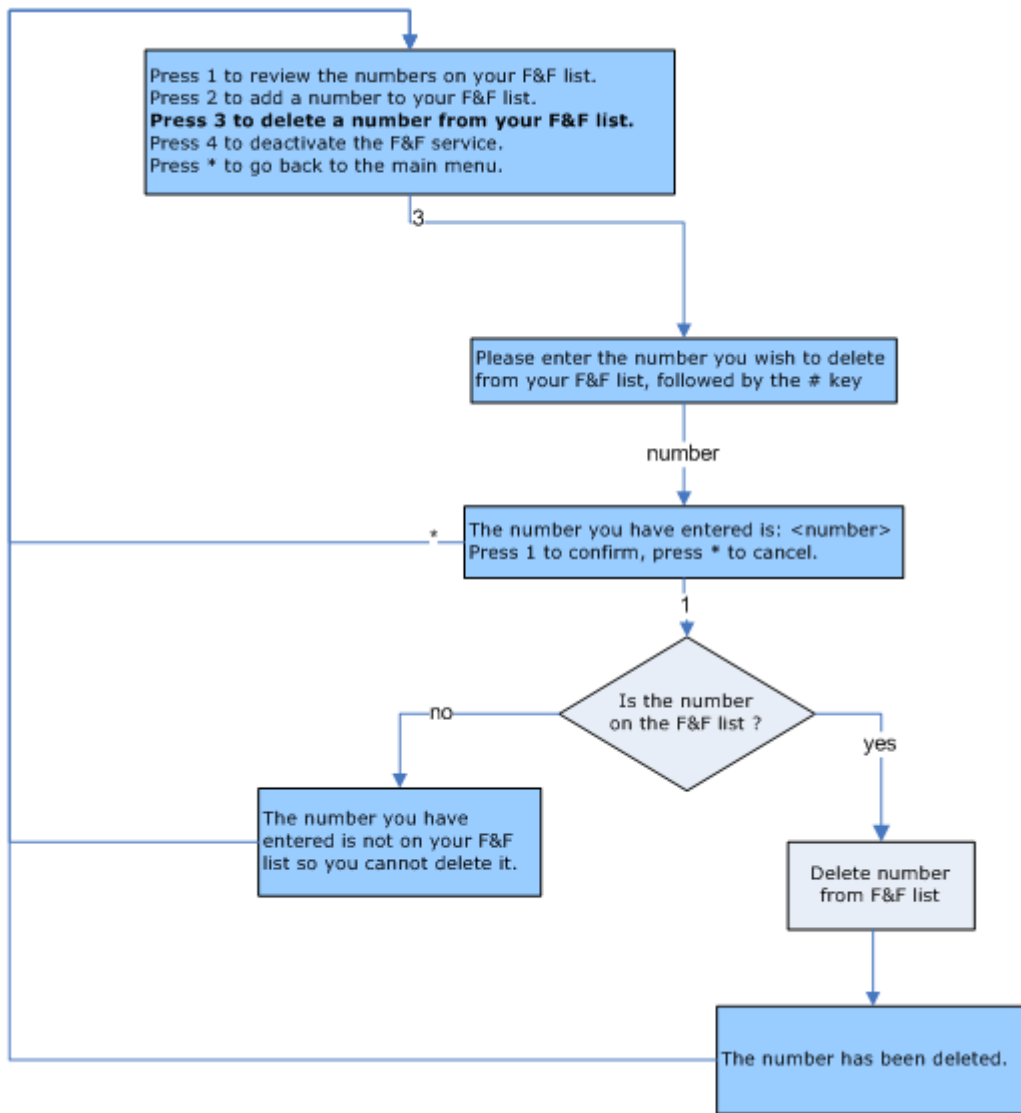




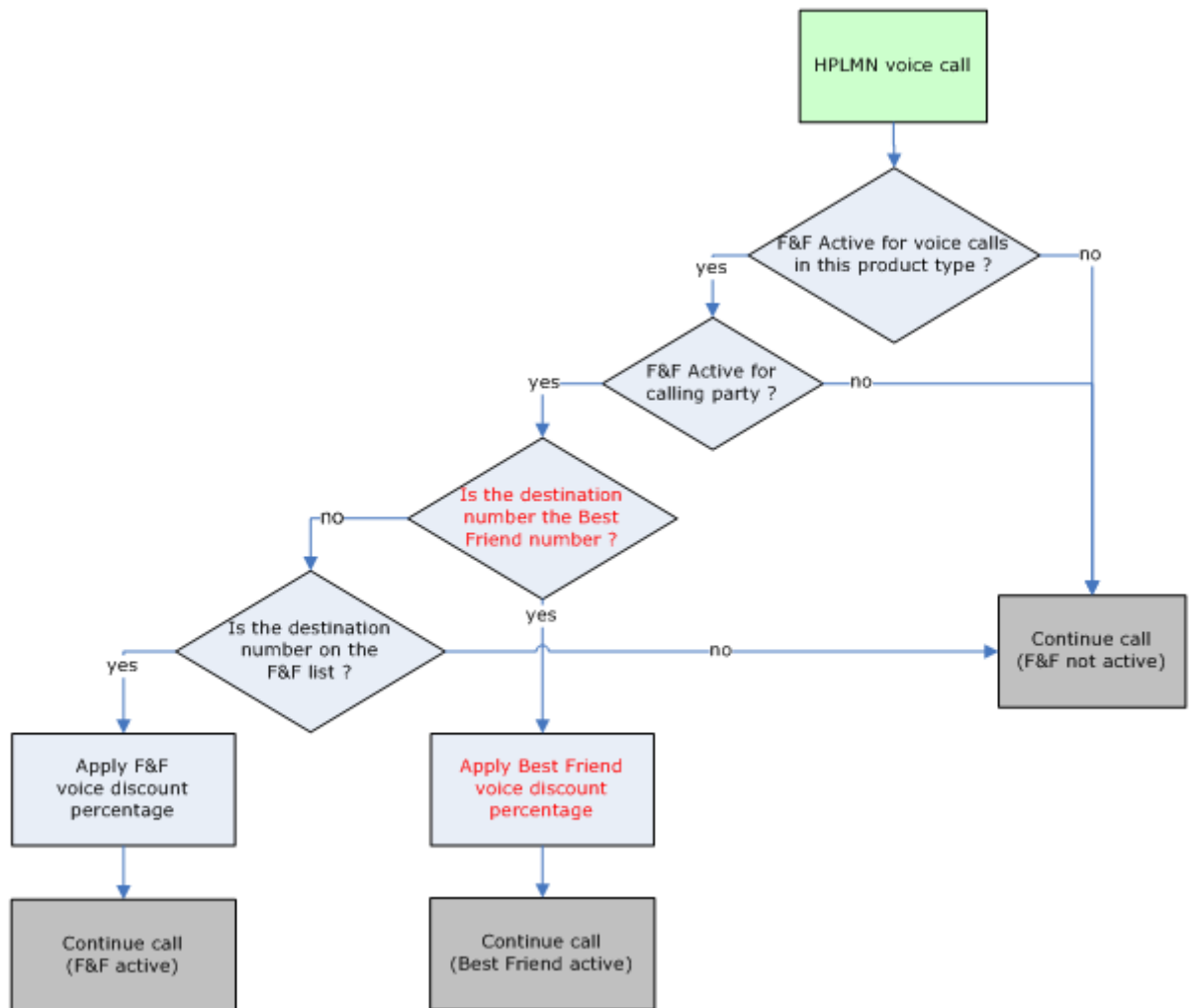
Add number



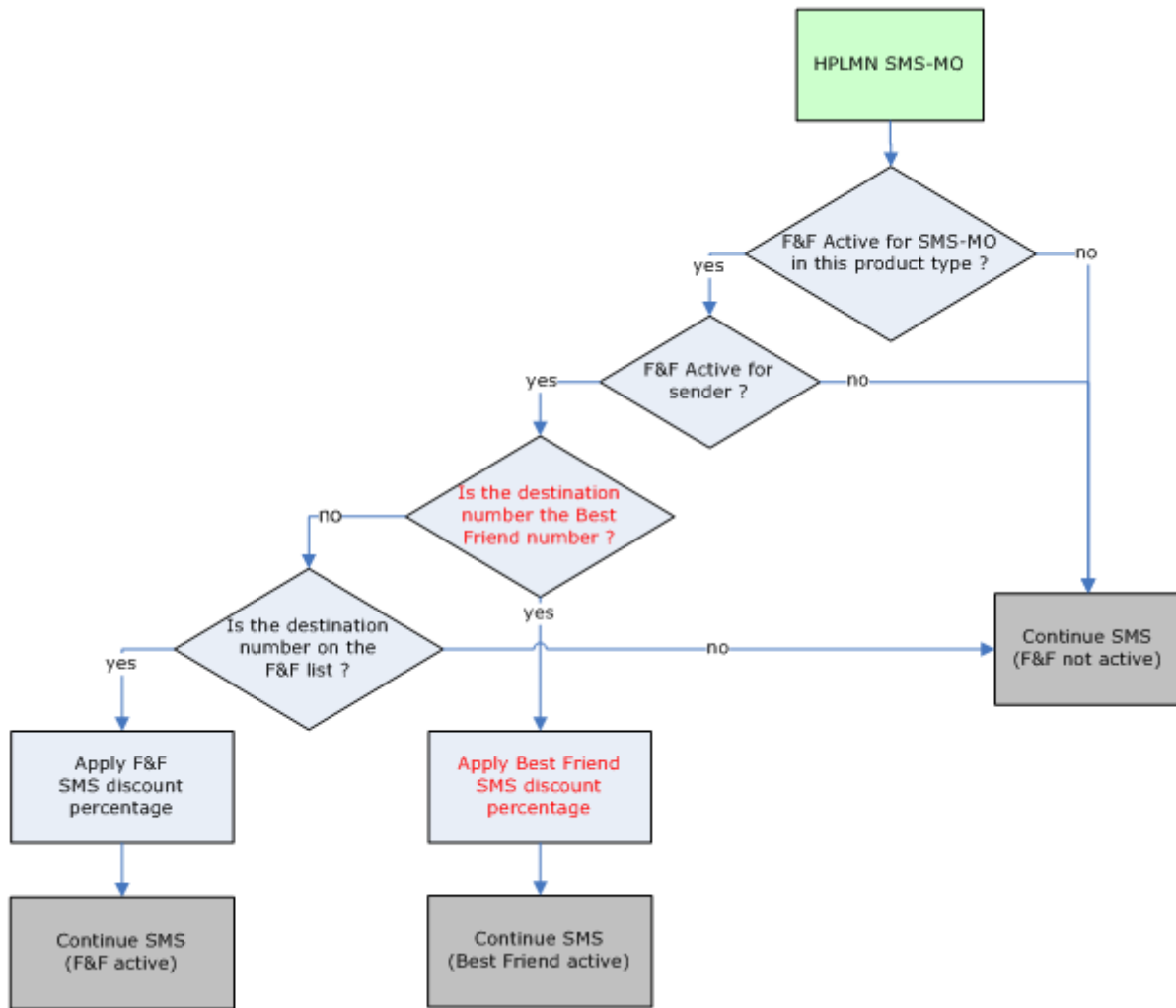
### Delete number



## With Best Friends option - HPLMN Voice

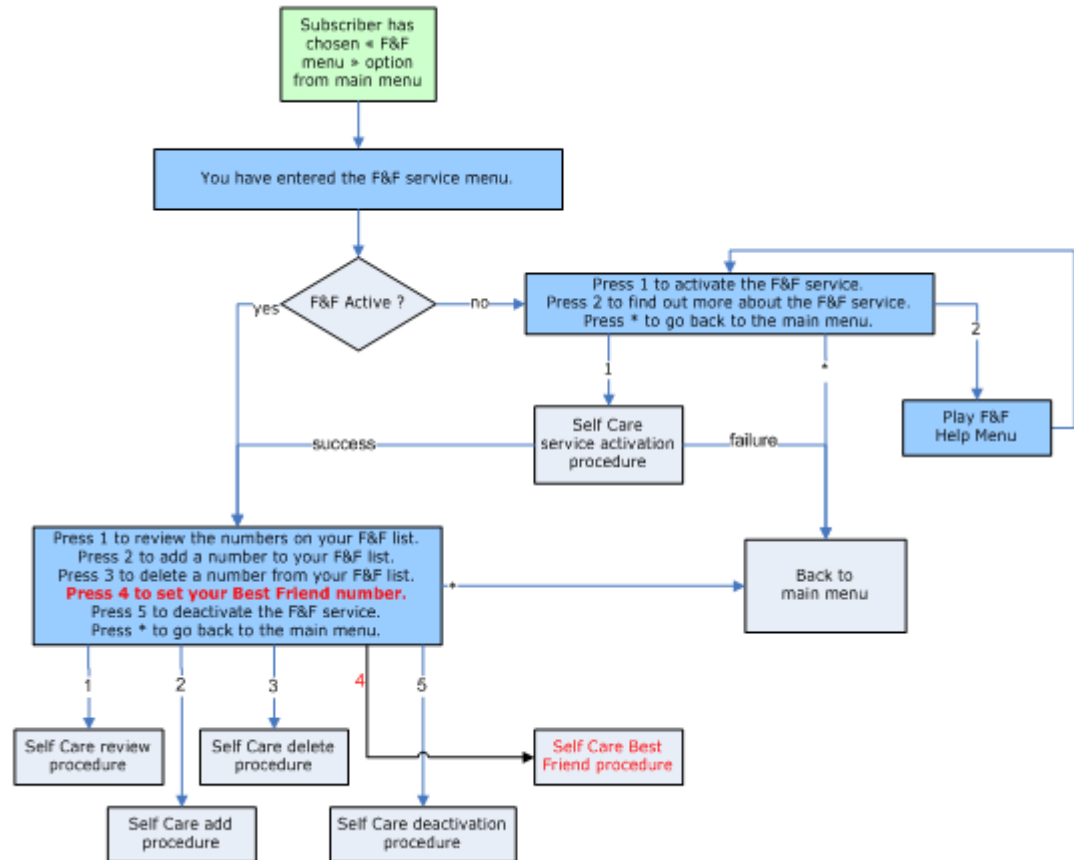


With Best Friends option - HPLMN SMS-MO

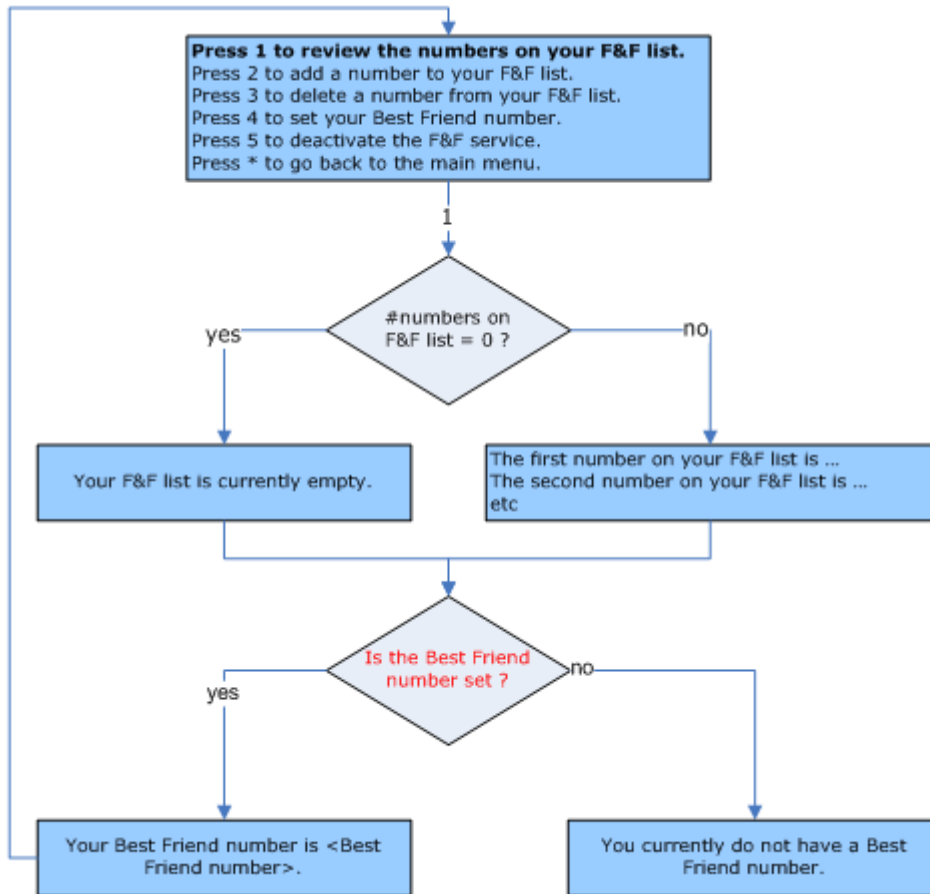


### Self care - Friends and Family with Best Friend menu

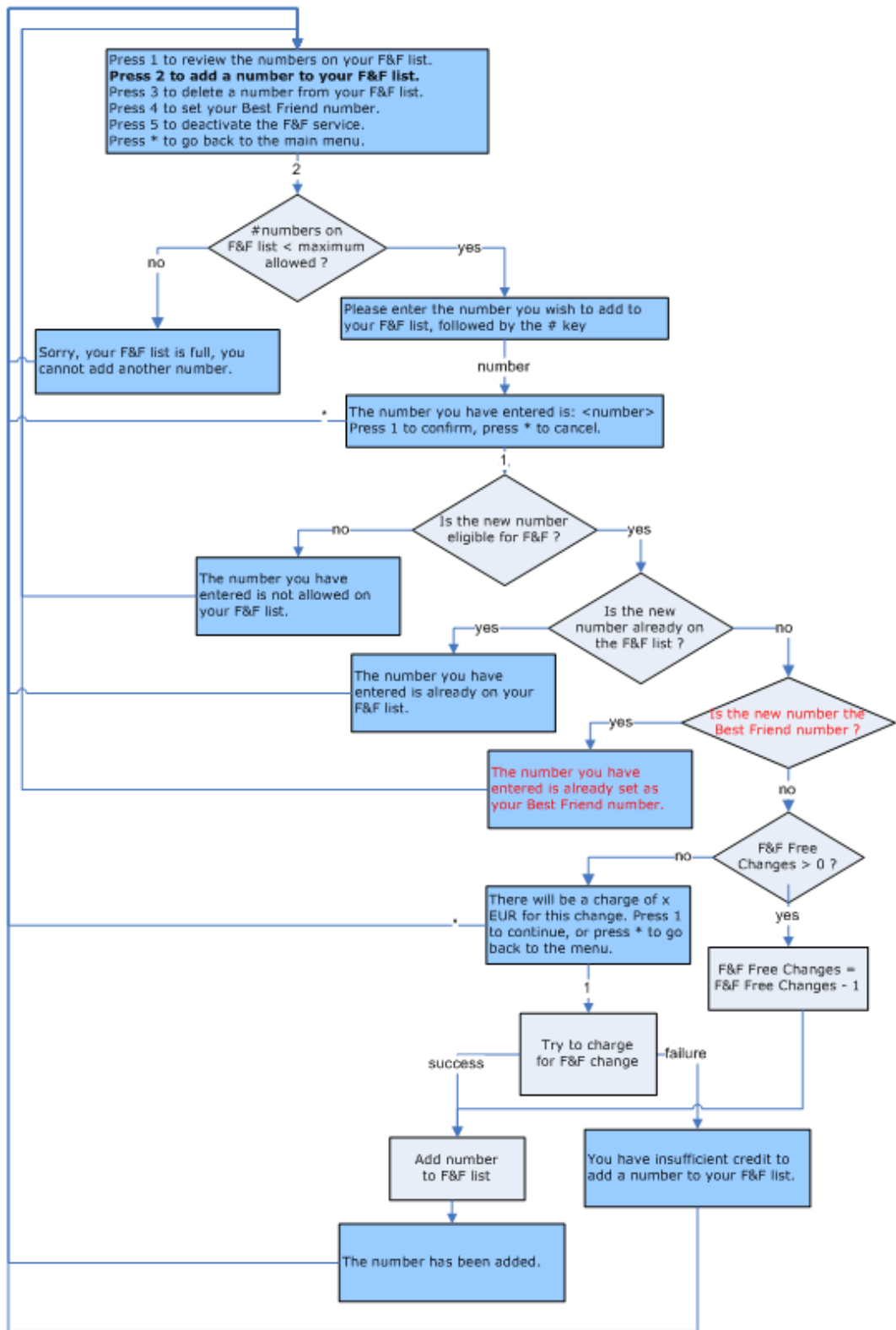
The flow charts below provide more information on how the F&F self care, including the Best Friend add-on, will function. The differences compared to the F&F self care interface without Best Friend are highlighted in red. Only the flow charts that are different are shown (for example activation/deactivation and number deletion have been omitted).



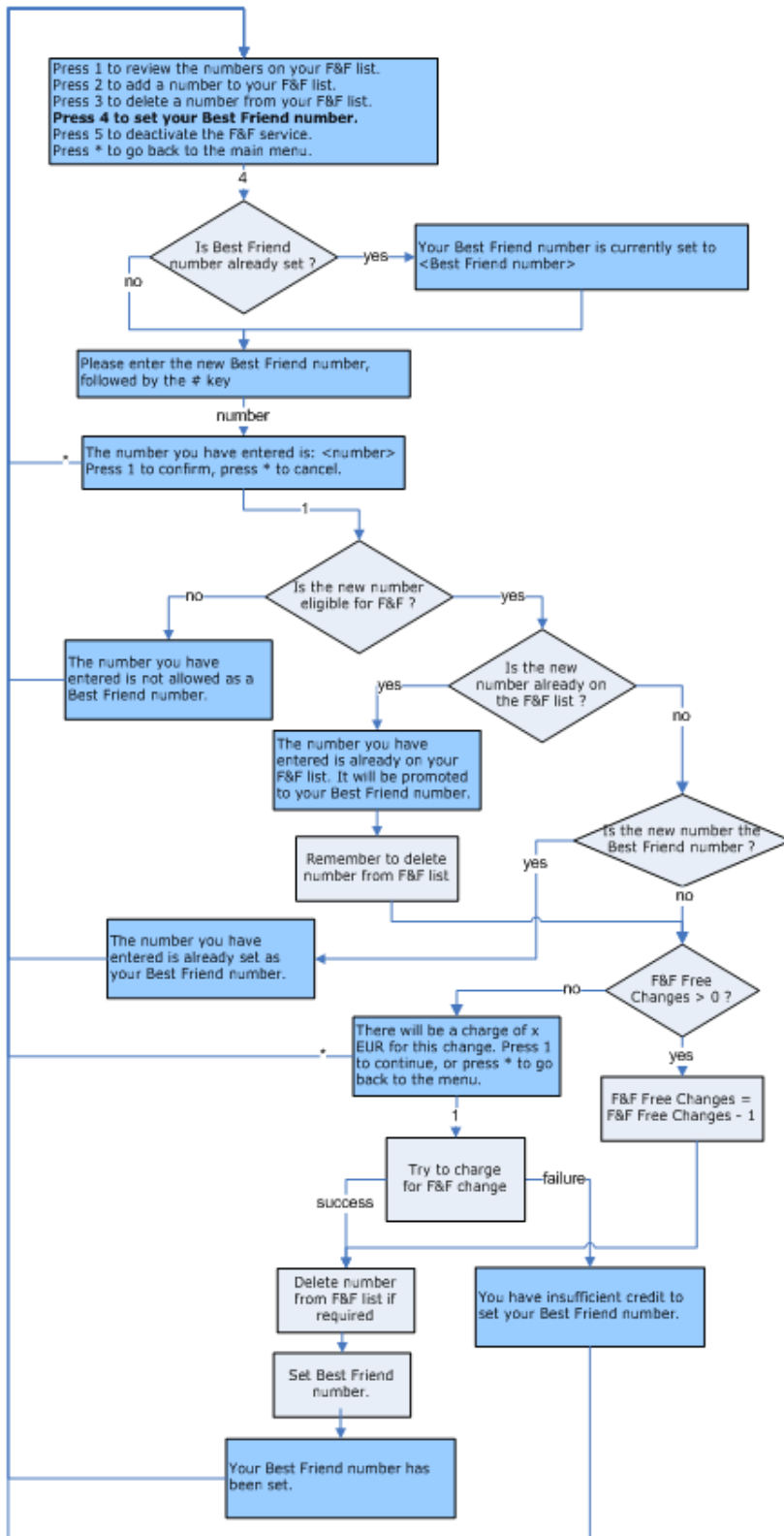
With Best Friend option - review numbers



With Best Friend option - add number



With Best Friend option - set Best Friend number





## Favourite Destination

### Introduction

The Favourite Destination (FD) service allows a subscriber to select a geographic fixed network area for which he gets discounts to the normal service fees.

The service is deployed inside the Prepaid Charging solution and may be offered for voice calls and SMS. The operator may nominate which access mechanisms will take advantage of the discount offered.

The list of possible Favourite Destinations must be defined by the operator, with one area containing either a single or multiple area prefixes. On a per product type basis the operator may restrict which area may be chosen. It is possible to choose either national or international prefixes, depending on the purpose of the service. An area is made up from telephone number prefixes. For example, in Suffolk the towns of Ipswich and Felixstowe are inside a single area. Ipswich uses the prefix area code of +441473 and Felixstowe +441394. When selecting Suffolk as a Favourite Destination, the user would then receive discounts towards all calls to a fixed line in Ipswich and Felixstowe.

By calling customer services, or by using self care features, the user can:

- Get information about FD service
- Activate their FD account
- Define / update their FD

The operator can choose the amount of occasions the user can modify their Favourite Destination without charge; for example the operator may allow 1 change for free, and then every other change there may be a fee applied.

The operator is able to define:

- Which services will be available to the FD service (Voice, SMS).
- Which type of destination will be eligible for FD nomination (based on prefixes).
- The FD discount which will be applied.
- The number of times a subscriber is able to modify his FD Destination without charge.
- The charge to be applied for a FD Destination change.
- A recurring fee for the FD service.

Each subscriber may nominate a single Favourite Destination.

All information relating to Favourite Destination may be viewed through the Customer Care screens or alternatively, accessed through the on-line Provisioning Interface for integration with an operator portal.

A FD Self-Care service is also available. For more information on the FD Self-Care, see Prepaid Charging Service Template - Self Care.

### Balance Types

The following balance types are used by the FD service.

Name	Type	Units	Usage
FD Free Changes	Charge	SMS	Used as a "Free Changes" counter, to indicate the number of free FD free changes.

Additionally, a "FD Free Changes" balance type cascade is created, which consists of the following balance types:

- FD Free Changes
- General Cash

## Chapter 8

This balance type cascade is used to charge for a FD Destination change. As long as the FD free changes balance is greater than zero, the FD destination change will be regarded as a free change.

### Named Events

The following named events are used by the FD service.

Name	Class	Description
Change Fee	FD	The cost of a FD Destination change.
Monthly Fee	FD	The recurring cost for the FD service.

### Example Event Set

These events are assigned to a product type specific named event catalogue, where they are overridden.

Prepaid Charging > Rating Management > Named Event Catalogue tab, select a named event catalogue and click **Edit**.

**Edit Named Event Catalogue**

Name: Gold    Include Default (Default)     Use Holiday Set: None

**Named Events**

Display Filters:

- Event Sets: All Sets
- Include In Catalogue: Included
- Max Rows: 999
- Event Name:
- Allowed in Catalogue: Allowed & Barred

Event Set	I	Named Event	A	Cash Cost	Time Cost (Secs)	More Info
BOOST	<input checked="" type="checkbox"/>	Boost 1 Periodic Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Boost 2 Periodic Fee	<input checked="" type="checkbox"/>	\$0.20		
	<input checked="" type="checkbox"/>	Boost 3 Periodic Fee	<input checked="" type="checkbox"/>	\$0.30		
	<input checked="" type="checkbox"/>	Boost 4 Periodic Fee	<input checked="" type="checkbox"/>	\$0.40		
	<input checked="" type="checkbox"/>	Boost 5 Periodic Fee	<input checked="" type="checkbox"/>	\$0.50		
CS	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
FD	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
FR	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.20		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
HA	<input checked="" type="checkbox"/>	HA	<input checked="" type="checkbox"/>			
Loyalty	<input checked="" type="checkbox"/>	Point	<input checked="" type="checkbox"/>	\$0.01		

Buttons: View Details, Delete Overrides, Select All

**Named Event Override Configuration**

Event Name:

Override Name	Cash Cost	Time Cost (Secs)	A	General
Change Fee	\$0.10		<input checked="" type="checkbox"/>	Yes

Buttons: New, Edit, Delete, Select All

Buttons: Save, Save and Close, Close

### Control Plans

The following control plans (CP) are used by the FD service.

Name	Description
FD IVR - SCP	FD Self-Care logic This CP is called by the overall IVR Self Care CP.

Name	Description
FD Activation – BPL	FD service activation logic (used by BPL).
FD Deactivation – BPL	FD service deactivation (used by BPL).
FD Change – BPL	Set or change the FD destination (used by BPL).
HPLMN-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains FD Voice service logic) This CP is called by the Voice CP (HPLMN-MO).
HPLMN-MO	HPLMN-MO control plan, which calls the "HPLMN-MO VAS Service Logic – SCP" CP.
SMS-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains FD SMS service logic) This CP is called by the SMS CP (SMS-MO).
SMS-MO	SMS-MO control plan, which calls the "SMS-MO VAS Service Logic – SCP" CP.
IVR Self Care	Overall IVR Self Care control plan, which calls VAS specific Self Care CPs.

## Profile Fields

The following profile fields are used by the FD service.

Name	Type	Tag	Profile Block	Usage
FD Recurring Fee	BOOLEAN	2813001	Global Profile	Defines whether a recurring fee should be applied.
Fd Recurring Fee Amount	INTEGER	2813002	Temporary Storage	Amount of the recurring fee charge (used in FD Self-Care control plan and BPLs).
FD Temp Number	NSTRING	2813006	Temporary Storage	Used during service logic processing.
FD Next Rebuild Date	DATE	2813008	App Specific 1	Used to track when the FD destination prefix tree needs rebuilding
FD Change Fee Amount	INTEGER	2813010	Temporary Storage	Amount of the recurring fee charge (used in FD Self-Care control plan)
FD Service Active	BOOLEAN	2813011	App Specific 2	Defines whether the FD service is active (product type)
FD Tree	PREFIX	2813012	App Specific 1	Stores the current favorite destination.
FD Voice Discount	DISCOUNT	2813013	App Specific 2	Discount percentage for FD voice calls.
FD SMS Discount	DISCOUNT	2813014	App Specific 2	Discount percentage for FD SMSs.

## Notifications

The following notifications are used by the FD service.

Field	Notification text
FD Disabled	Your FD service has been disabled.
FD Extended	Your FD service has been extended.
FD Grace	Your FD grace period has started.

**Note:** Only the English text is present in the table above. Other languages will also be present on a standard NCC installation.

These notifications are used as periodic charge notifications.

## Recharge types

The following recharge types (RT) are used by the FD service.

Field	Usage
FD Free Changes	This RT is used to reset the "Free Changes" counter.

## Business Process Logic

The following BPLs are used by the FD service.

Field	Description
FDCHG	Set/Change the FD destination.
FDACT	Activate the FD service for the subscriber.
FDDACT	Deactivate the FD service for the subscriber.

## Periodic Charges

The following periodic charge (PC) is used by the FD service.

Name	Usage
FD	This PC determines whether the user has subscribed to the FD service and performs two operations, every month: <ul style="list-style-type: none"> <li>Reset FD free change counter</li> <li>Debit FD periodic fee</li> </ul>

## Screens

The FD service uses two SPM custom screens:

- Product Type
- Subscriber

## Product Type screen

Here is an example screen.

**Edit Product Type** [Help]

- Bypass numbers
- Creditcard Recharge Rules
- Second Currency
- What's New
- Help & Info
- Product Type Swaps
- Node Options
- Activation Credits
- Remote Access
- Friends and Destination
- Friends and Family
- Promotional Destination Rates
- Cumulative Balances
- Real-Time Wallet Notifications
- Periodic Charges
- Adjustments
- Wallet Life Cycle
- Subscriber Profile Limitations
- Profile
  - Friends & Family Config
  - **Favourite Destination Config**
  - Balance Dependant Rating Co
  - Closed User Group Config
  - Community Services Config
  - Overdraft Config
  - Home Zone Config
  - Heavy User Config
  - Booster 1 Config
  - Booster 2 Config
  - Booster 3 Config
  - Booster 4 Config
  - Booster 5 Config
  - Happy Birthday Config
  - Happy Anniversary Config
  - Peer to Peer Config
  - Service Bundles Config
  - Loyalty Service Config

Favourite Destination enabled

Voice Discount

First Discount %	10
Second Discount %	20
Maximum Charge (littles)	-1

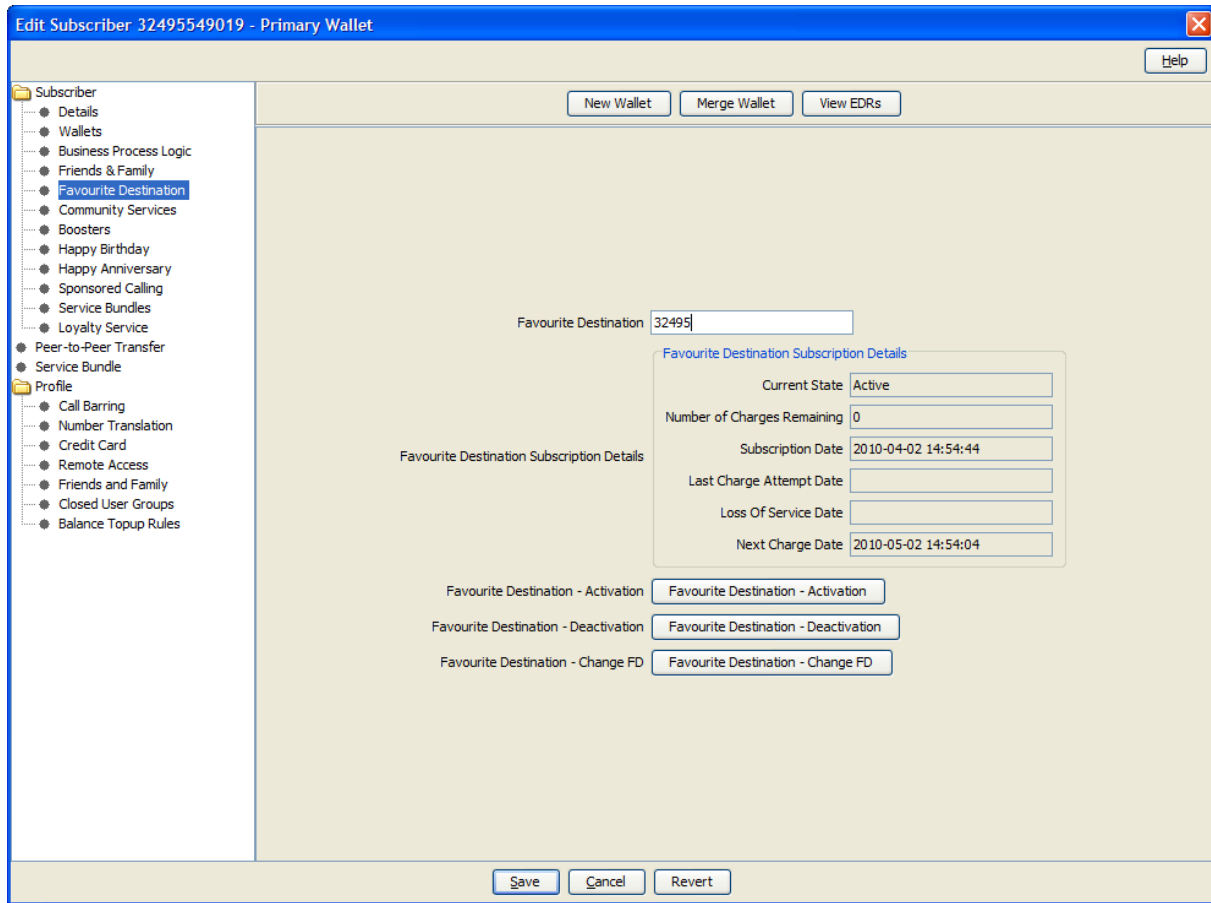
SMS Discount

First Discount %	10
Second Discount %	20
Maximum Charge (littles)	-1

[Save] [Cancel]

### Subscriber screen

Here is an example screen.



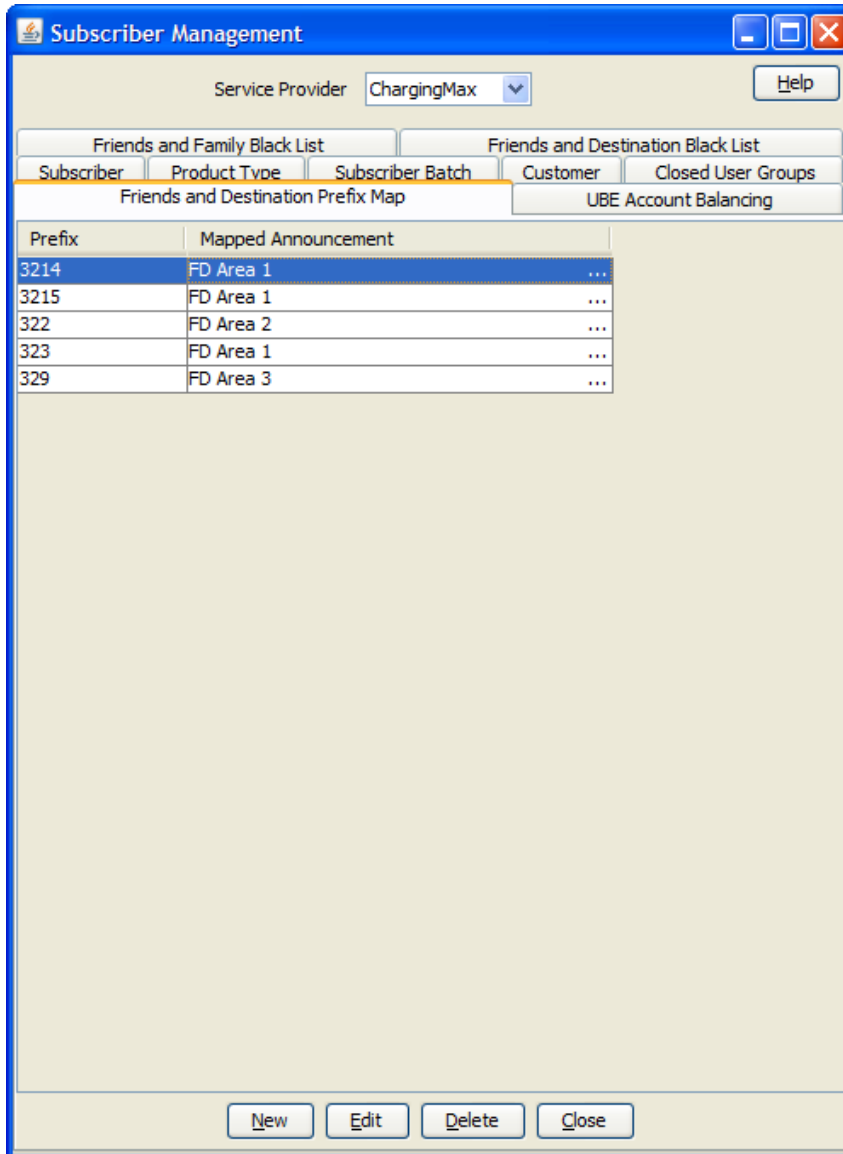
### Screens Template access

A standard NCC installation creates access rights for the custom FD screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

## Areas

A standard NCC installation creates the FD Destinations (also referred to as Areas). The user can configure the areas which are created by APE, and will be used as input by APE.



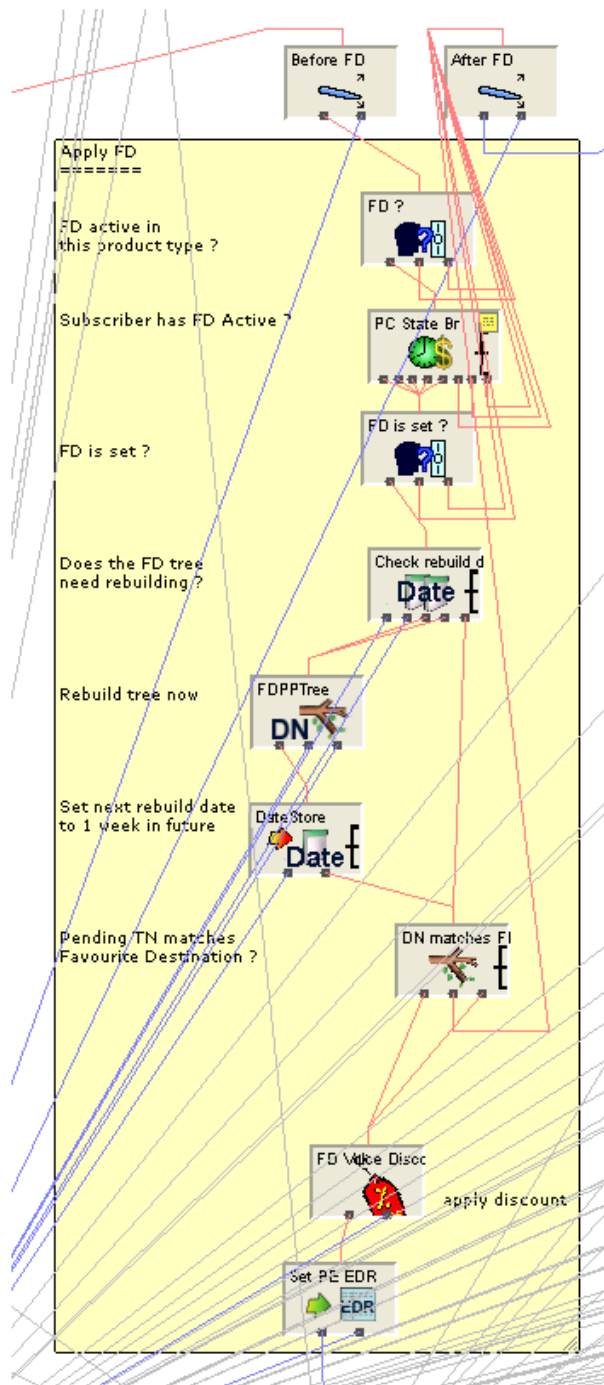
## Service Logic

As with all VAS services, the Voice and SMS control plans each have a "VAS Service Logic" sub control plan, called respectively:

- "HPLMN-MO VAS Service Logic – SCP"
- "SMS-MO VAS Service Logic – SCP"

These "VAS Service Logic" control plans contain the service logic for this service, and are only used for HPLMN-MO and SMS-MO capabilities.

The Voice and SMS FD service logic is identical and looks like this:

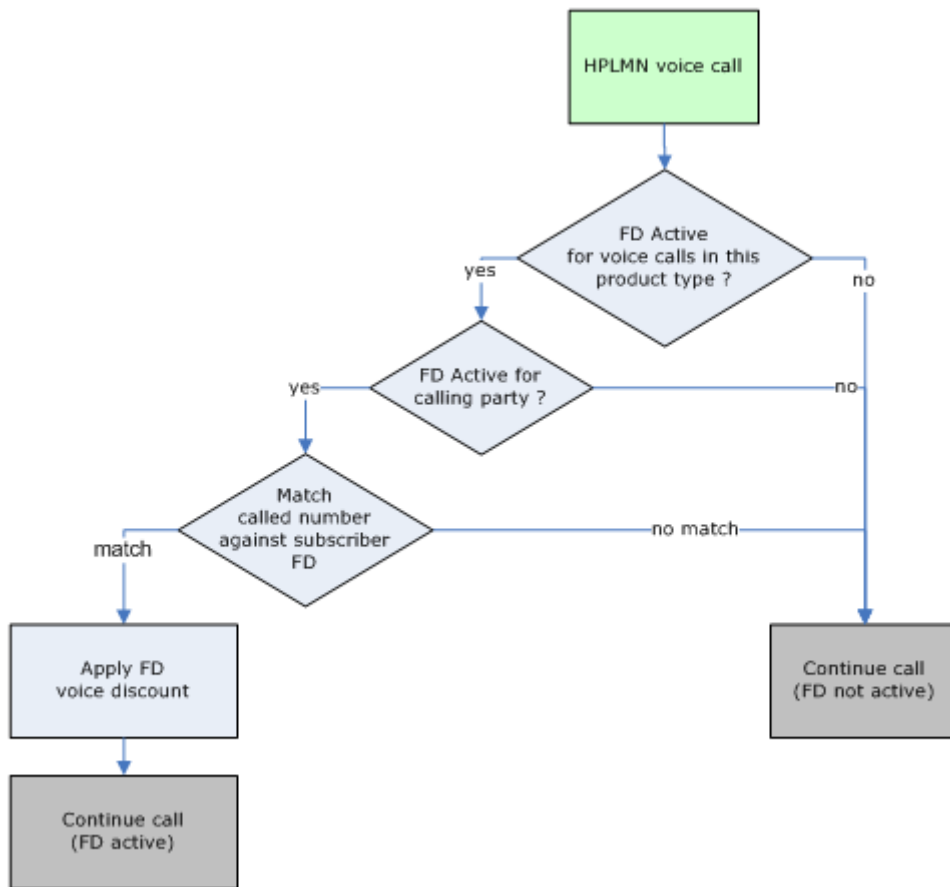


## Flow charts

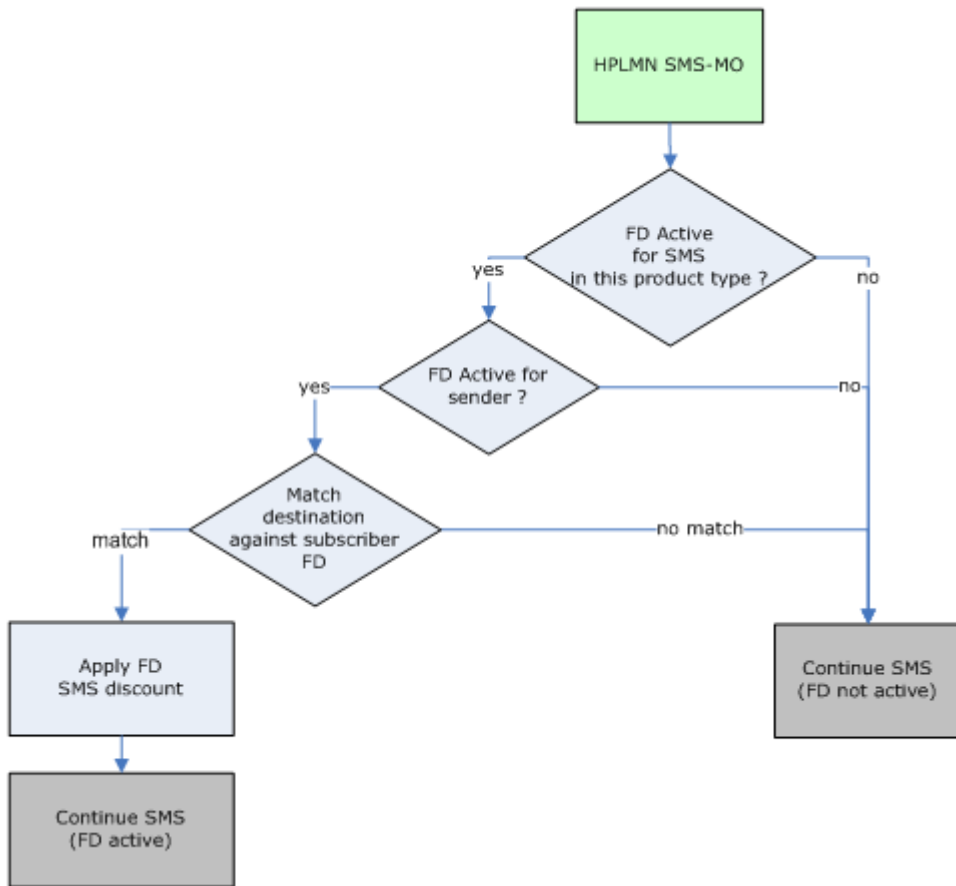
The flow charts below provide more information on how the FD service functions for the different call scenarios.



## HPLMN Voice



**HPLMN SMS-MO**



**Self Care**

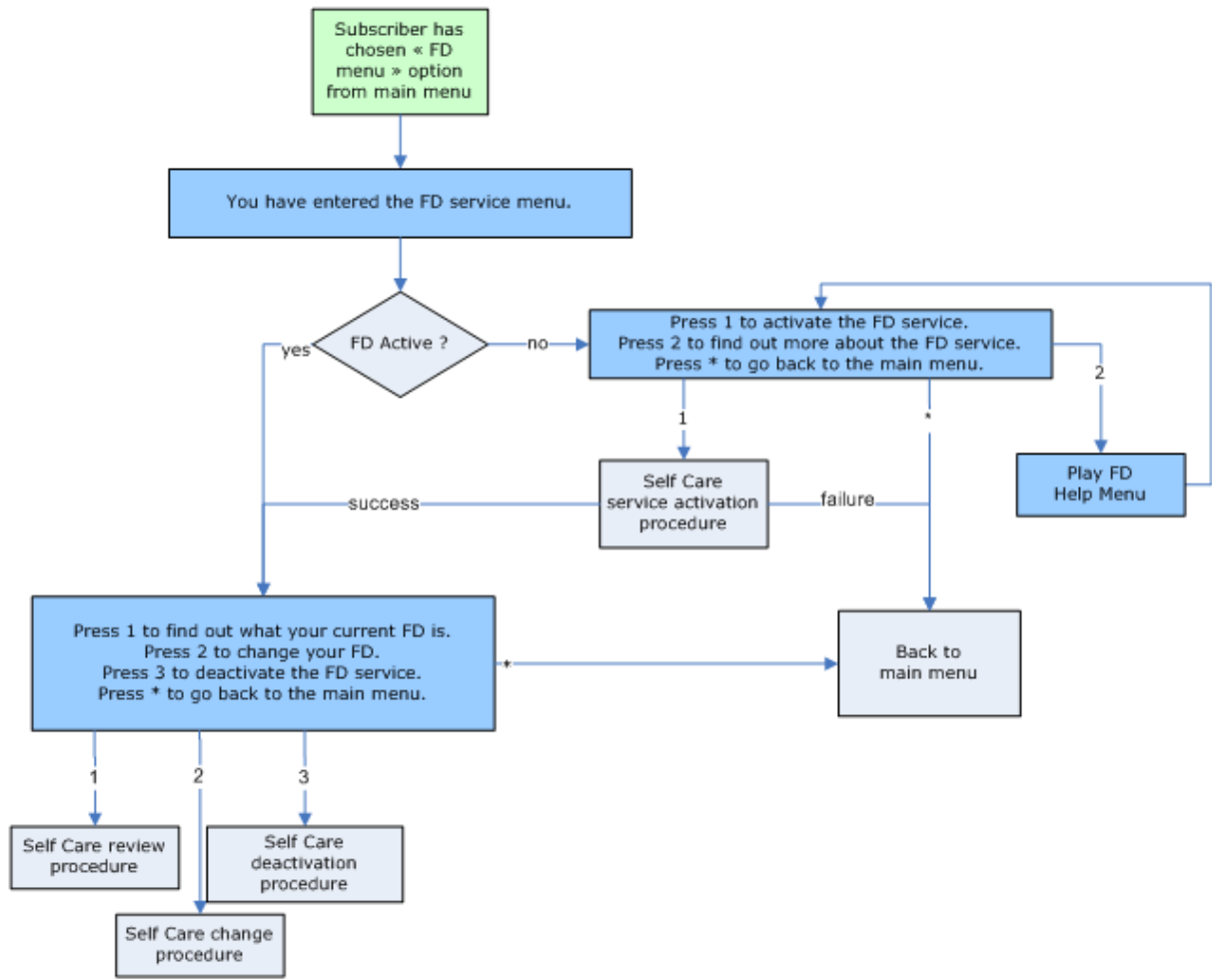
The flow charts below provide more information on how the FD self care functions.

The flow charts contain a number of parameter references.

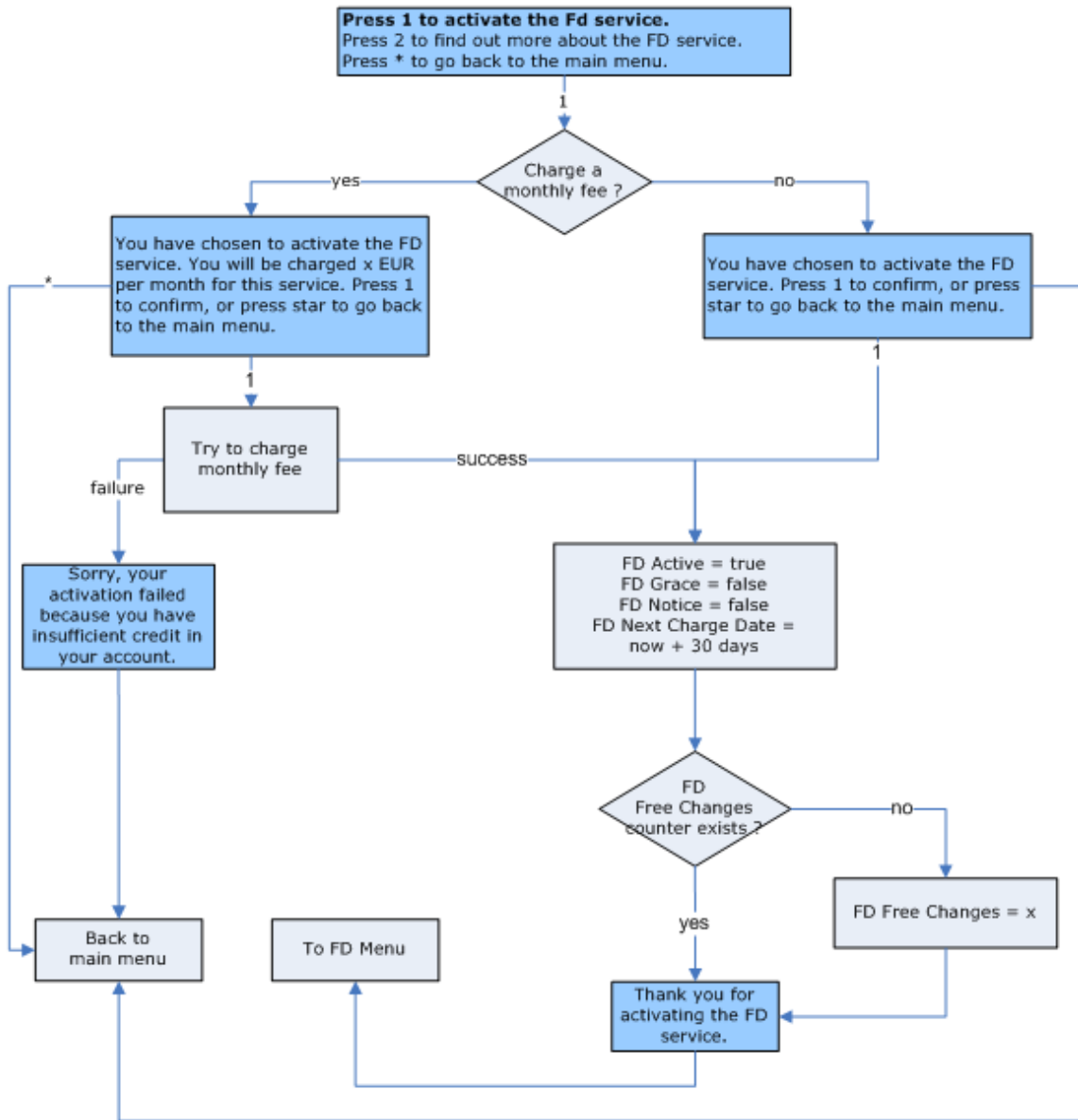
Here is a description of the meaning of each of these parameters:

- FD Active: is the FD service active for the subscriber ?
- FD Notice: has this subscriber requested to unsubscribe from the FD service ?
- FD Grace: has the FD grace period started for this subscriber ?
- FD Next Charge Date: date when the monthly recurring fee will be applied next

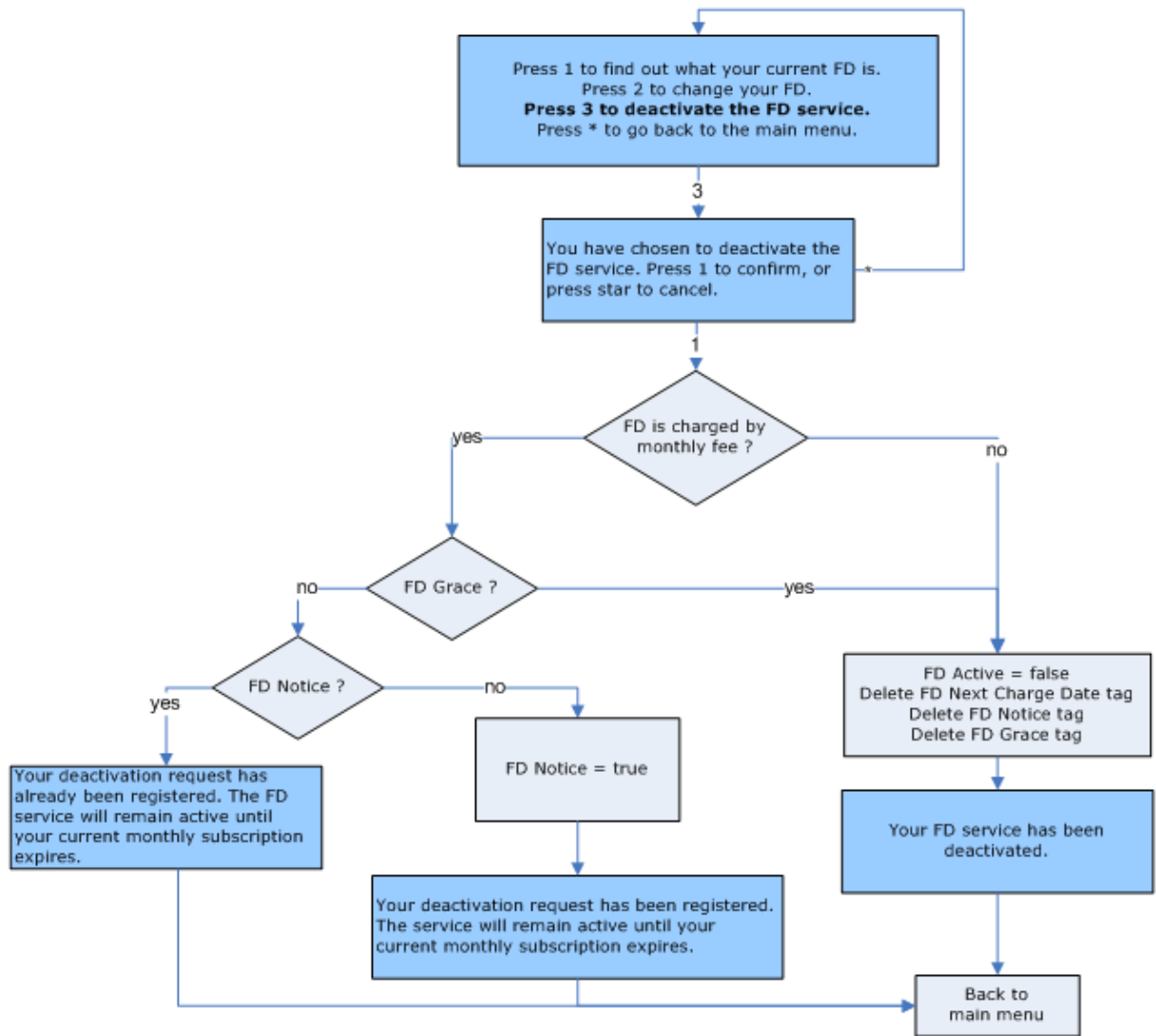
- FD Free Changes: number of times the subscriber can still change his FD list for no extra charge



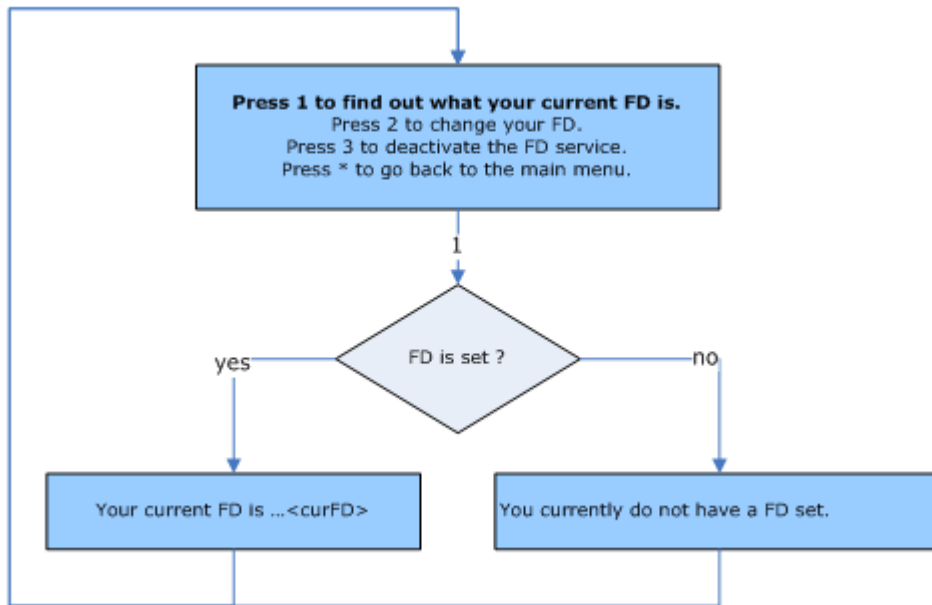
Service activation



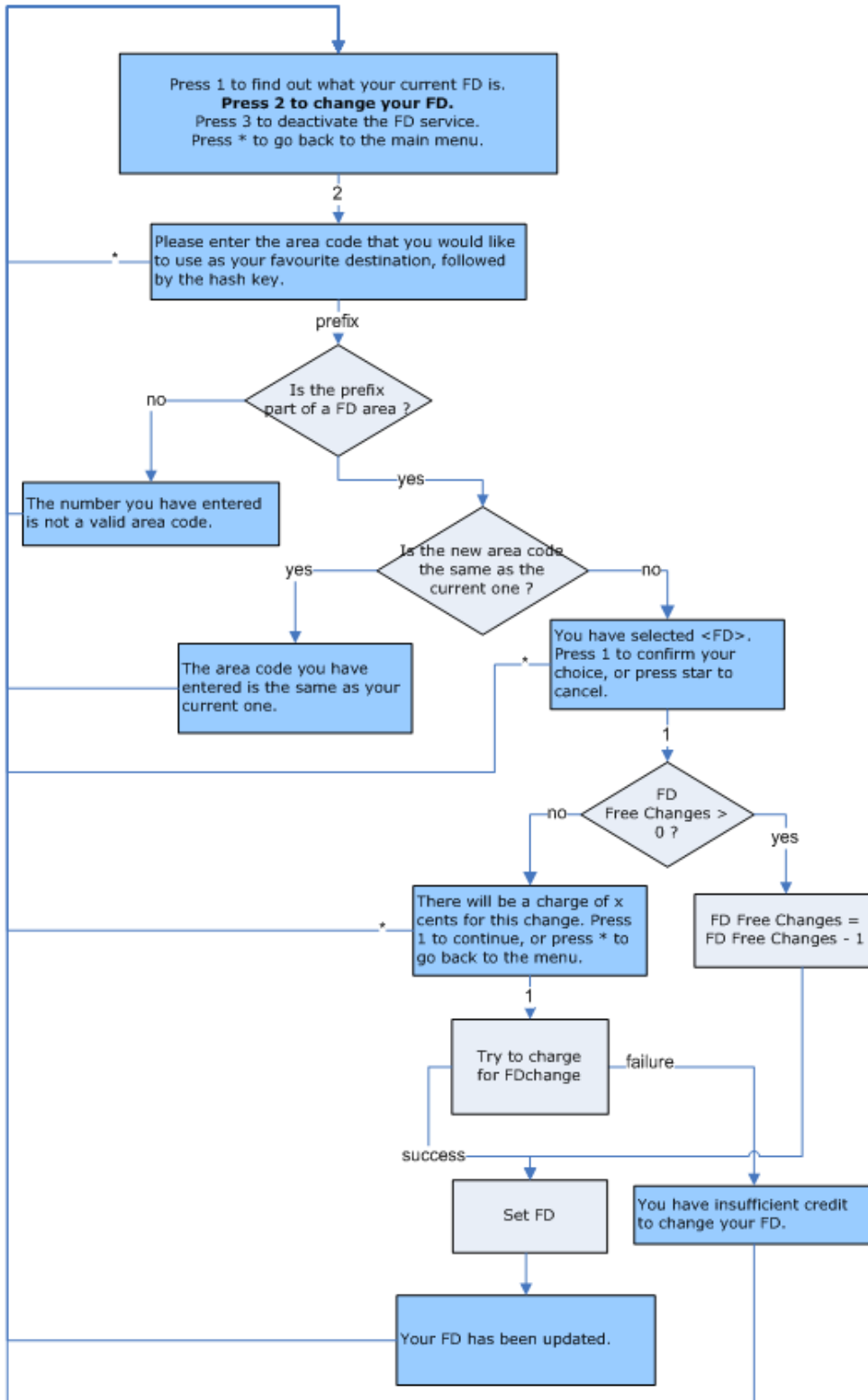
Service de-activation



Review FD



Set FD



## Balance Dependant Rating

### Introduction

The “Balance Dependant Rating” Service (BDR) applies a discount for subscribers who have high balances in their prepaid account (General Cash Balance Type). On a standard NCC install, a BDR configuration with three Levels will be set up.

A BDR Self-Care service is also available. For more information on the BDR Self-Care, see - Prepaid Charging Service Template - Self Care.

### Control Plans

The following control plans (CP) are used by the BDR service.

Name	Description
BDR IVR - SCP	BDR self-care logic This CP is called by the overall IVR self care CP.
HPLMN-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains BDR voice service logic). This CP is called by the Voice CP (HPLMN-MO).
HPLMN-MO	HPLMN-MO control plan, which calls the “HPLMN-MO VAS Service Logic – SCP” CP.
SMS-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains BDR SMS service logic). This CP is called by the SMS CP (SMS-MO).
SMS-MO	SMS-MO control plan, which calls the “SMS-MO VAS Service Logic – SCP” CP.
IVR Self Care	Overall IVR self care control plan, which calls VAS specific self care CPs.

### Profile Fields

The following profile fields are used by the BDR service.

Name	Type	Tag	Profile Block	Usage
BDR Service Active	BOOLEAN	2814000	App Specific 2	Defines whether the BDR service is active (product type).
BDR Discount Level 1	INTEGER	2814002	App Specific 2	BDR Discount 1 value (Used in BDR IVR).
BDR Discount Level 2	INTEGER	2814003	App Specific 2	BDR Discount 2 value (Used in BDR IVR).
BDR Discount Level 3	INTEGER	2814004	App Specific 2	BDR Discount 3 value (Used in BDR IVR).
BDR Threshold Level 1	INTEGER	2814005	App Specific 2	BDR Threshold 1 value (Used in BDR IVR).
BDR Discount 1	DISCOUNT	2814006	App Specific 2	Discount percentage 1 for BDR Voice calls and SMSs.
BDR Discount 2	DISCOUNT	2814007	App Specific 2	Discount percentage 2 for BDR Voice calls and SMSs.
BDR Discount 3	DISCOUNT	2814008	App Specific 2	Discount percentage 3 for BDR Voice calls and SMSs.



## Notifications

The following notifications are used by the BDR service.

Field	Notification text
BDR Bronze Discount 1	Your current credit is sufficient to have <i>disc%</i> discount on all national calls and SMS.
BDR Bronze Discount 2	Your current credit is sufficient to have <i>disc%</i> discount on all national calls and SMS.
BDR Bronze Discount 3	Your current credit is sufficient to have <i>disc%</i> discount on all national calls and SMS.
BDR Silver Discount 1	Your current credit is sufficient to have <i>disc%</i> discount on all national calls and SMS.
BDR Silver Discount 2	Your current credit is sufficient to have <i>disc%</i> discount on all national calls and SMS.
BDR Silver Discount 3	Your current credit is sufficient to have <i>disc%</i> discount on all national calls and SMS.
BDR Gold Discount 1	Your current credit is sufficient to have <i>disc%</i> discount on all national calls and SMS.
BDR Gold Discount 2	Your current credit is sufficient to have <i>disc%</i> discount on all national calls and SMS.
BDR Gold Discount 3	Your current credit is sufficient to have <i>disc%</i> discount on all national calls and SMS.
BDR no discount	Your current credit is sufficient to have <i>disc%</i> discount on all national calls and SMS.

**Note:** Only the English text is present in the table above. Other languages will also be present on a standard NCC installation.

## RTW notifications

These notification templates are used as Real-Time Wallet (RTW) Notifications. The following RTW notifications are set up for the BDR service.

Name	Type	Template
BDR Bronze drop below Level 1	Charging	BDR no discount
BDR Bronze drop below Level 2	Charging	BDR Bronze Discount 1
BDR Bronze drop below Level 3	Charging	BDR Bronze Discount 2
BDR Bronze climb above Level 1	Recharging	BDR Bronze Discount 1
BDR Bronze climb above Level 2	Recharging	BDR Bronze Discount 2
BDR Bronze climb above Level 3	Recharging	BDR Bronze Discount 3
BDR Silver drop below Level 1	Charging	BDR no discount
BDR Silver drop below Level 2	Charging	BDR Silver Discount 1
BDR Silver drop below Level 3	Charging	BDR Silver Discount 2
BDR Silver climb above Level 1	Recharging	BDR Silver Discount 1
BDR Silver climb above Level 2	Recharging	BDR Silver Discount 2
BDR Silver climb above Level 3	Recharging	BDR Silver Discount 3
BDR Gold drop below Level 1	Charging	BDR no discount

Name	Type	Template
BDR Gold drop below Level 2	Charging	BDR Gold Discount 1
BDR Gold drop below Level 3	Charging	BDR Gold Discount 2
BDR Gold climb above Level 1	Recharging	BDR Gold Discount 1
BDR Gold climb above Level 2	Recharging	BDR Gold Discount 2
BDR Gold climb above Level 3	Recharging	BDR Gold Discount 3

These RTW notifications are assigned to the NCC product types.

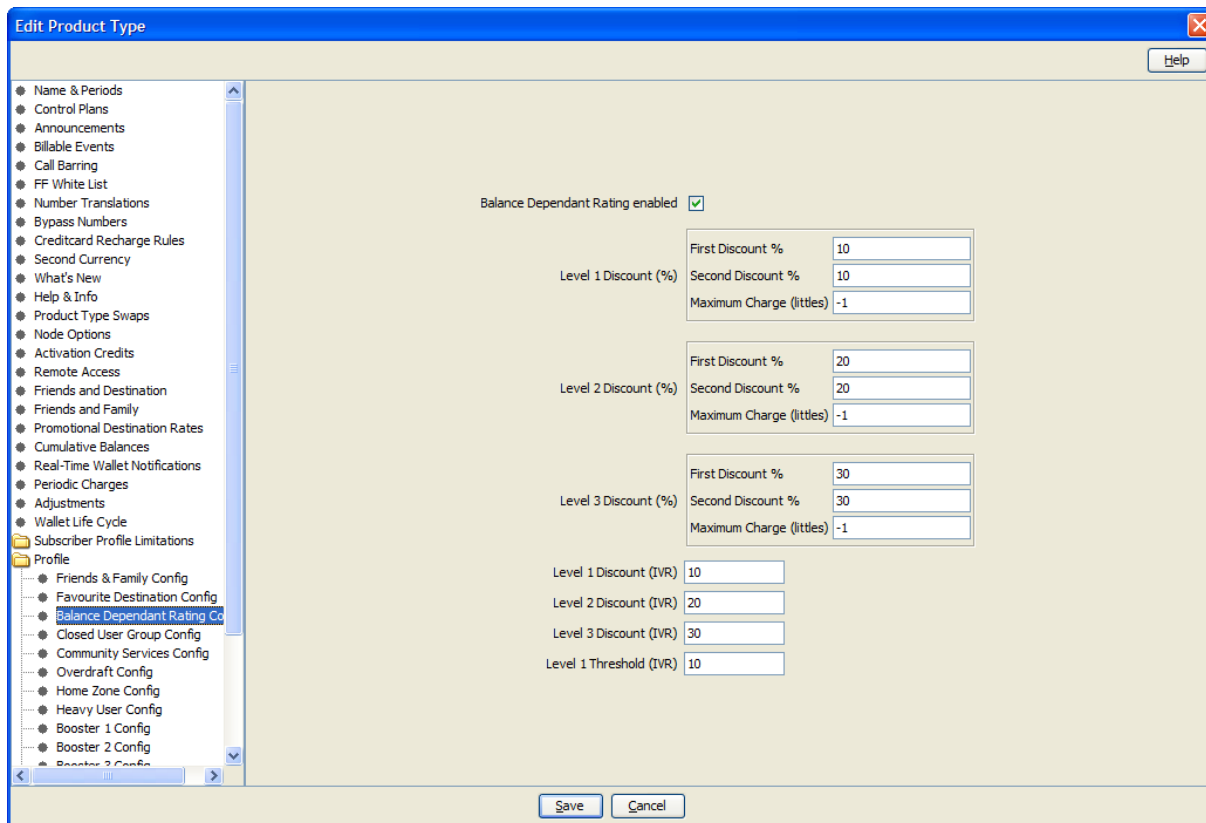
## Screens

The BDR service uses the following custom screen:

- Product Type

### Product Type screen

Here is an example screen.



The following configuration options are available on a product type level:

- BDR service active
- BDR Voice/SMS Discounts (for 3 BDR Levels)
- BDR IVR Discounts (for 3 BDR Levels)
- BDR IVR Threshold

The IVR settings are used by the IVR Self-Care service logic.

**Screens Template access**

A standard NCC installation creates access rights for the custom BDR screens, for the following users:

- “Operator”
- “Administrator”

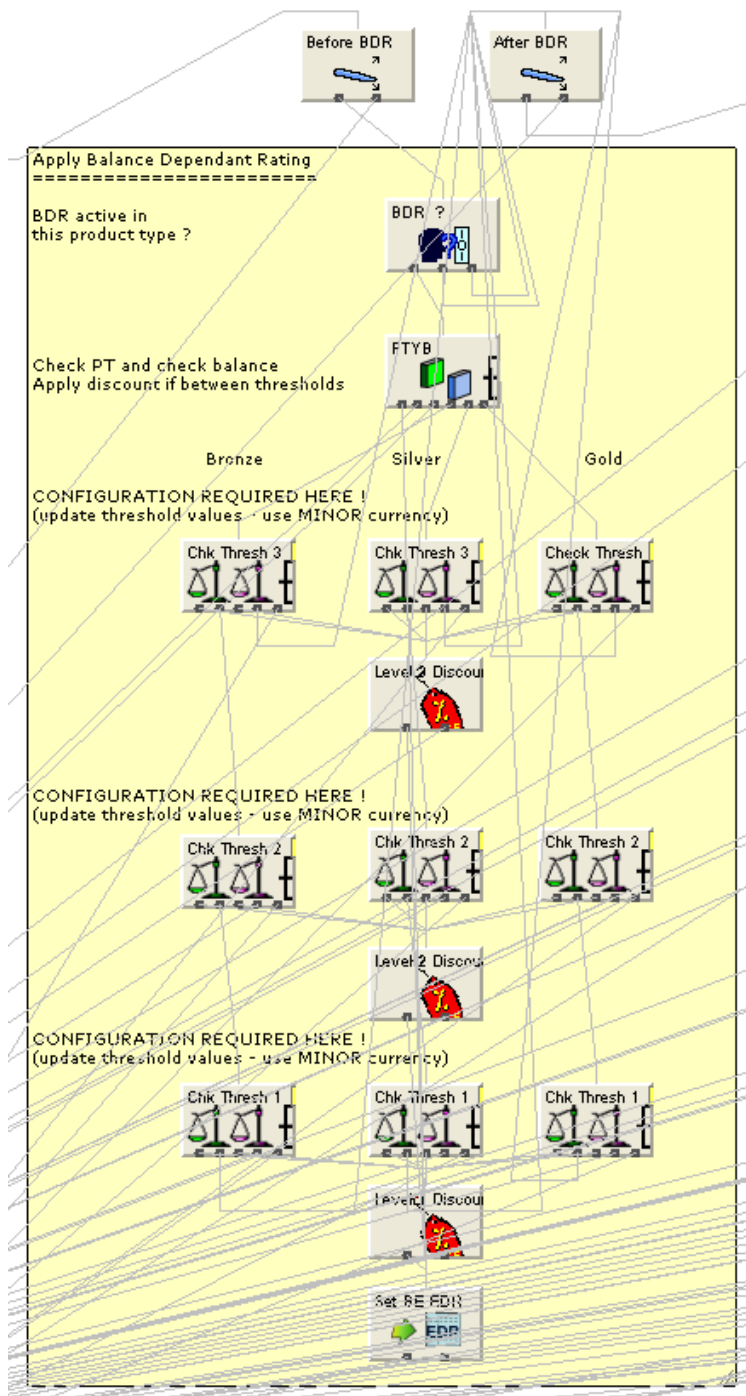
**Service Logic**

As with all VAS services, the Voice and SMS control plans each have a “VAS Service Logic” sub control plan, called respectively:

- “HPLMN-MO VAS Service Logic – SCP”
- “SMS-MO VAS Service Logic – SCP”

These “VAS Service Logic” control plans contain the service logic for this service, and are only used for HPLMN-MO and SMS-MO capabilities.

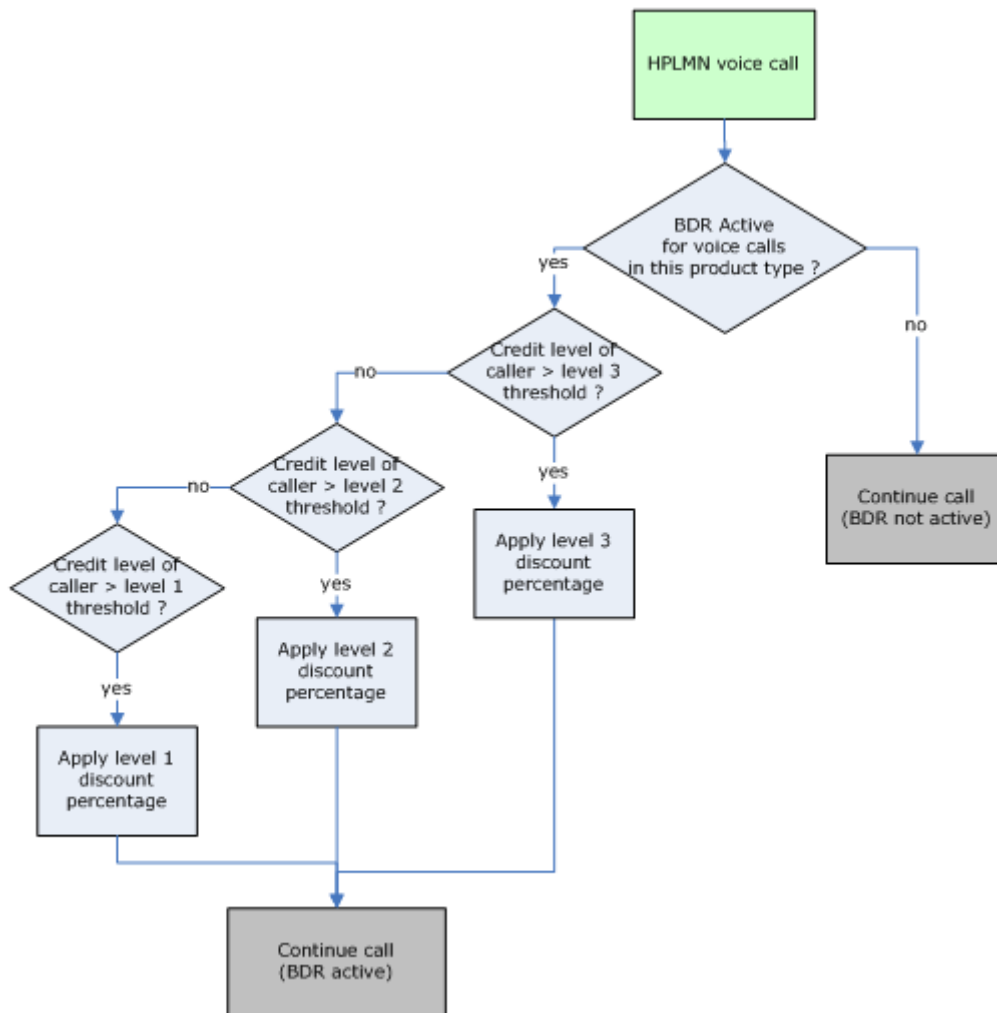
The Voice and SMS BDR service logic is identical and looks like this:



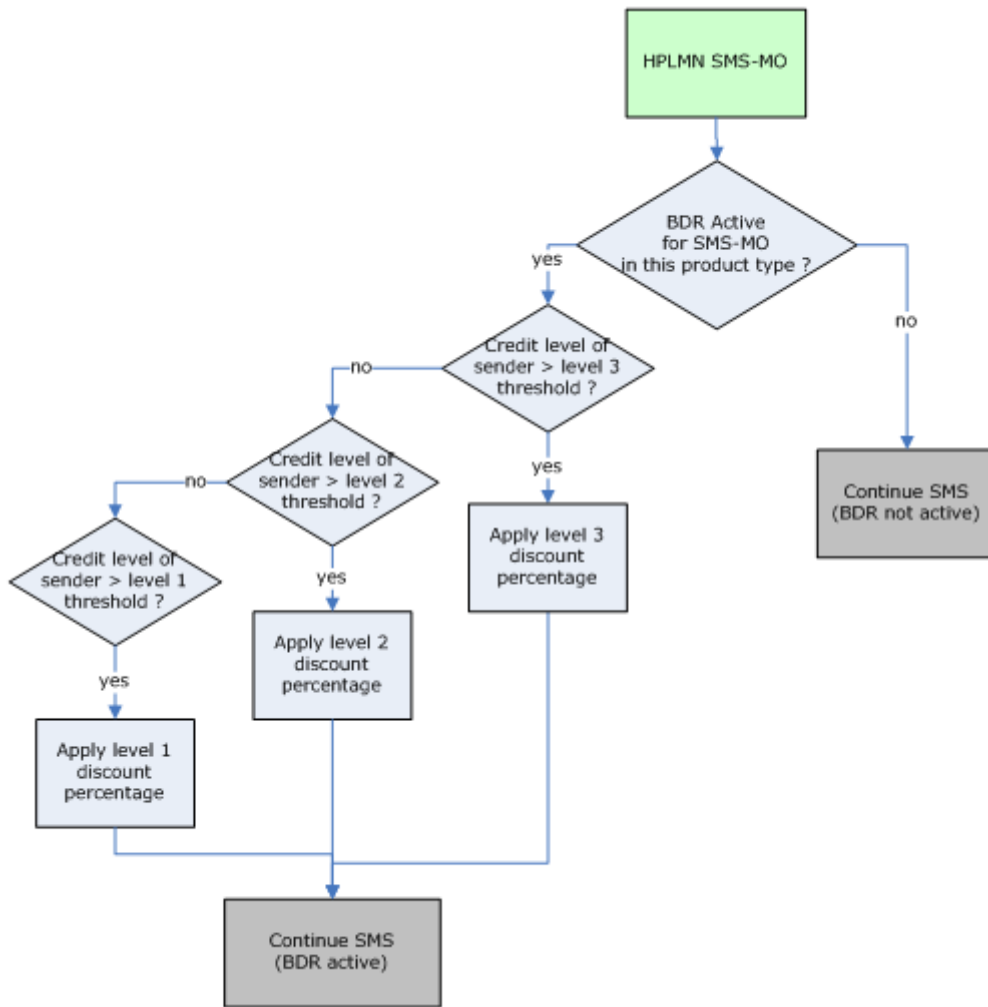
### Flow charts

The flow charts below provide more information on how the BDR service functions for the different call scenarios.

## HPLMN Voice

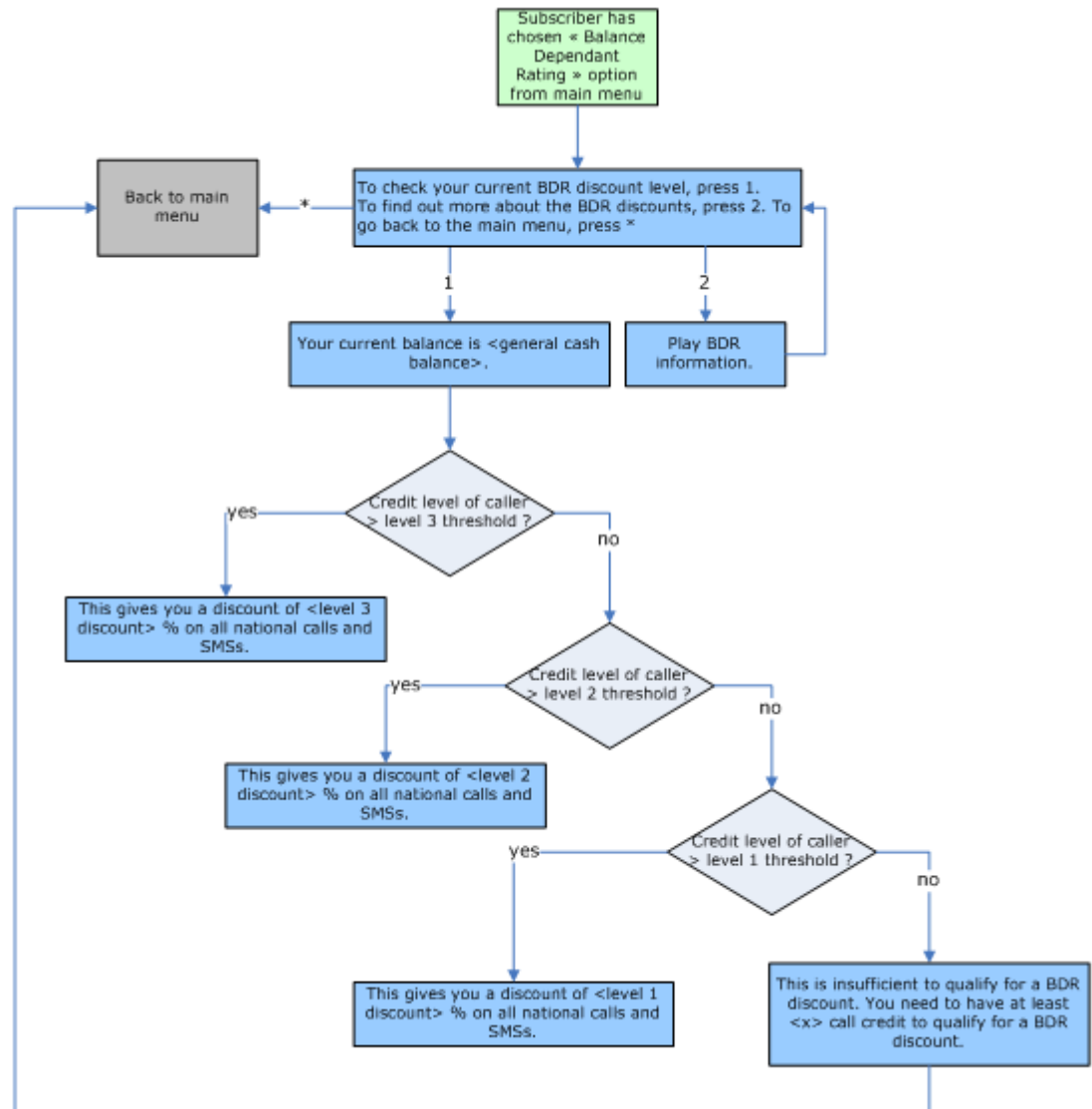


HPLMN SMS-MO



## Self Care - Check Discount

The flow chart below provides more information on how the Balance Dependant Rating self care functions.



## Closed User Group

### Introduction

The “Closed User Group” service (CUG) allows the operator to offer alternative rates between groups of subscribers.

## Control Plans

The following control plans (CP) are used by the CUG service.

Name	Description
HPLMN-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains CUG voice service logic). This CP is called by the Voice CP (HPLMN-MO).
HPLMN-MO	HPLMN-MO control plan, which calls the “HPLMN-MO VAS Service Logic – SCP” CP.
SMS-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains CUG SMS service logic). This CP is called by the SMS CP (SMS-MO)
SMS-MO	SMS-MO control plan, which calls the “SMS-MO VAS Service Logic – SCP” CP.

## Profile Fields

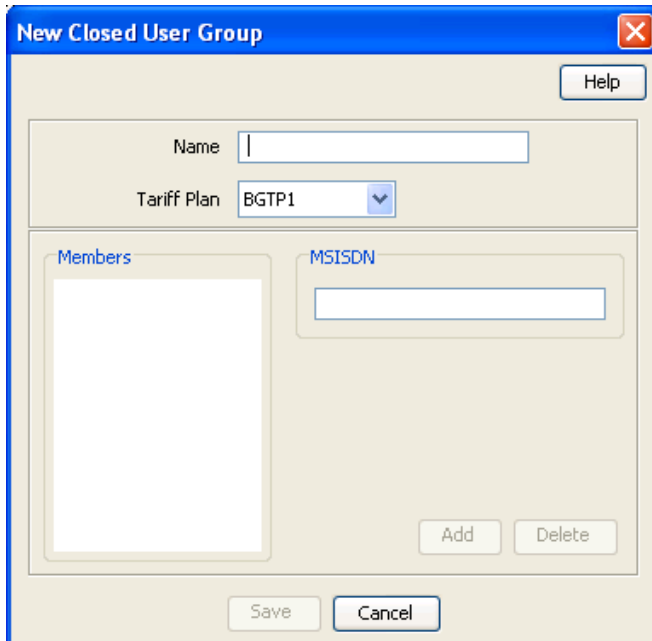
The following profile fields are used by the CUG service.

Name	Type	Tag	Profile Block	Usage
CUG Service Active	BOOLEAN	2816001	Global Profile	Defines whether the CUG service is active (globally).
CUG Discount	DISCOUNT	2816002	App Specific 2	Discount percentage for CUG SMSs (used in SMS VAS Service Logic CP).
CUG Voice Active	BOOLEAN	2816003	Global Profile	Defines whether the CUG service is active for Voice Calls (globally).
CUG SMS Active	BOOLEAN	2816004	Global Profile	Defines whether the CUG service is active for SMSs (globally).



## Rates

For CUG Voice calls, a CUG-specific tariff plan is used as opposed to the normal tariff plan. A standard NCC installation will configure five CUG tariff plans. You can assign pre-configured CUG tariff plans to CUGs through the **Prepaid Charging > Subscriber Management > Closed User Groups** tab.



The screenshot shows a window titled "New Closed User Group" with a close button in the top right corner. A "Help" button is located in the top right of the main content area. The form contains the following fields and controls:

- Name:** A text input field.
- Tariff Plan:** A dropdown menu with "BGTP1" selected.
- Members:** A list area with "Add" and "Delete" buttons below it.
- MSISDN:** A text input field.
- Save and Cancel:** Buttons at the bottom of the dialog.

For CUG SMSs, a CUG discount is applied, as a tariff plan override cannot be used for SMS billing purposes.

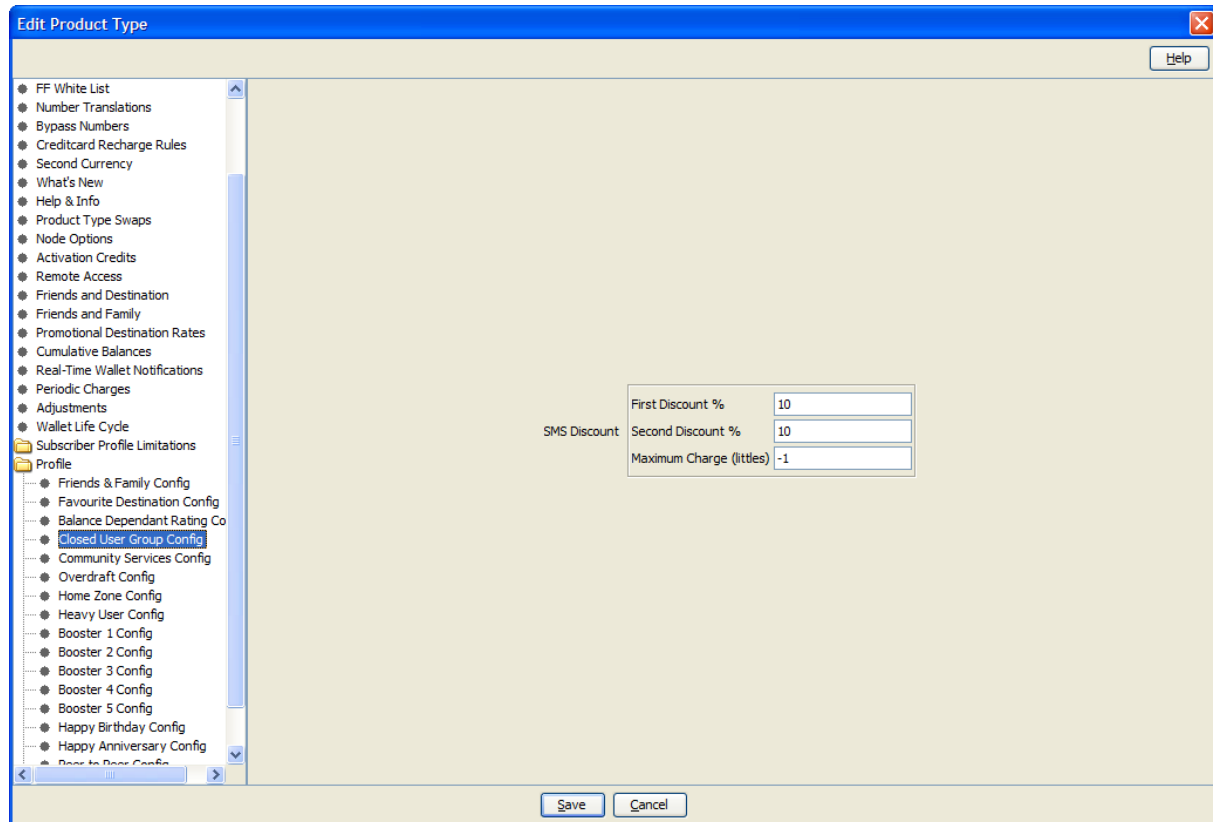
## Screens

The CUG service uses the following custom screen:

- Product Type

## Product Type screen

Here is an example screen.



The following configuration options are available on a product type level:

- CUG SMS Discount

## Screens Template access

A standard NCC installation creates access rights for the custom CUG screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

## Service logic

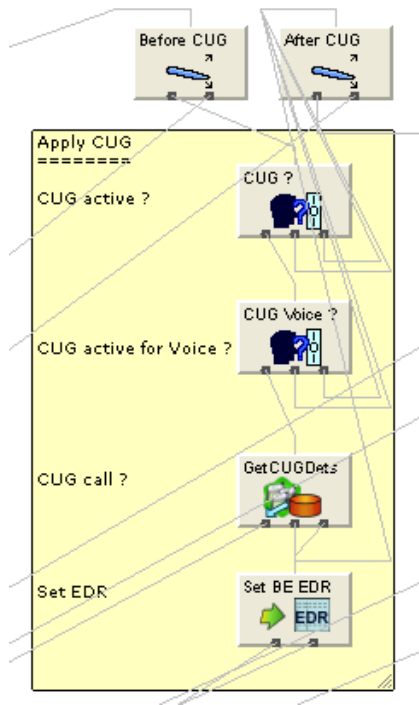
As with all VAS services, the Voice and SMS control plans each have a "VAS Service Logic" sub control plan, called respectively:

- "HPLMN-MO VAS Service Logic – SCP"
- "SMS-MO VAS Service Logic – SCP"

These "VAS Service Logic" control plans contain the service logic for this service, and are only used for HPLMN-MO and SMS-MO capabilities.

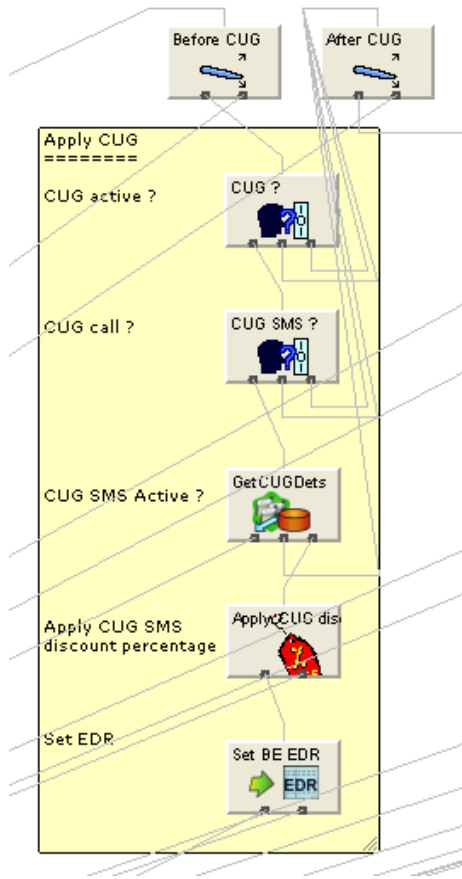
## Voice

The Voice CUG service logic looks like this:



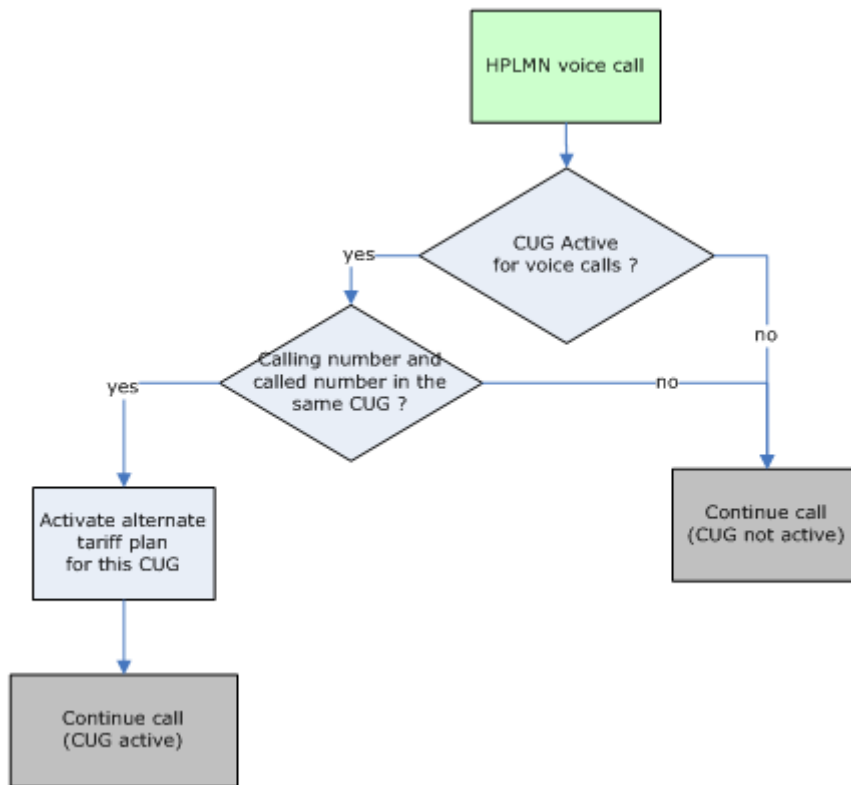
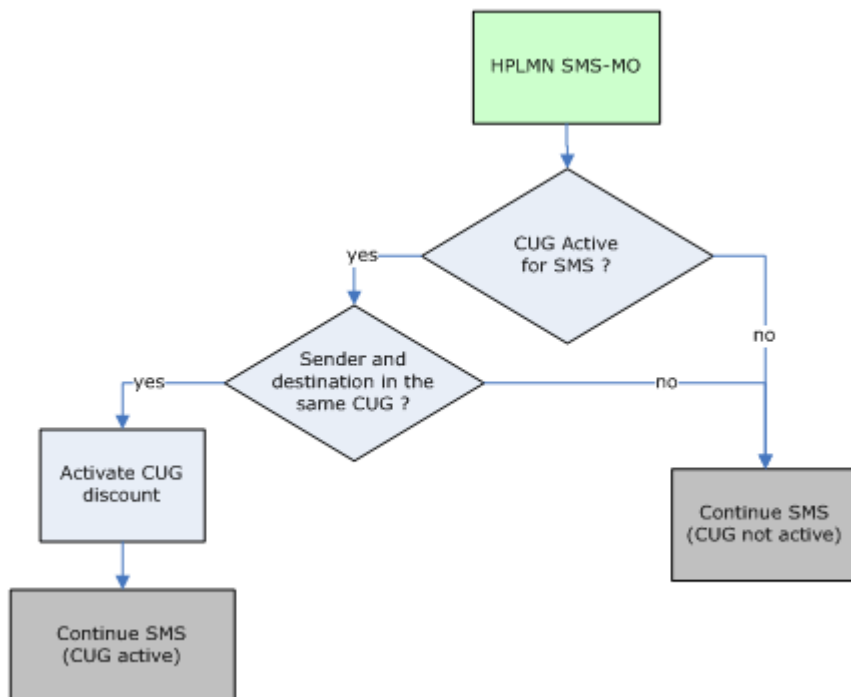
### SMS

The SMS CUG service logic looks like this:



### Flow charts

The flow charts below provide more information on how the CUG service functions for the different call scenarios.

**HPLMN Voice****HPLMN SMS-MO**

# Community Services

## Introduction

The “Community Service” service (CS) allows preferential rates to be activated between members of the same community.

The operator is able to define:

- Which services will be available to the CS service (voice, SMS).
- Whether a discount or tariff plan override will be used.
- The maximum number of communities a subscriber can belong to (Maximum 8).
- The charge to be applied for a CS community change.
- A recurring fee for the CS service.
- A pre-call announcement or post-call notification, informing the subscriber of the CS call.

The operator could offer a selection of eight different communities, and give the user the option to join one of the communities. It is also the option of the operator to allow a user to join the community for free or to apply a monthly subscription fee.

By calling customer services or by using self care features, the user can:

- Get information about community services
- Join or leave a community

The subscriber can be notified that they are calling a community member by a pre-call announcement or by including community service information in any post-call notification.

A CS self care service is also available. For more information on the CS self care, see Prepaid Charging Service Template - Self Care.

## Tariff Plan

A CS-specific tariff plan (with associated rates) is available as the default tariff plan may be overridden in the control plan.

## Named Events

The following named events are used by the CS service.

Field	Class	Description
Change Fee	CS	The cost of a CS community change.
Monthly Fee	CS	The recurring cost for the CS service.

## Example Event Set

These events are assigned to a product type specific named event catalogue, where they are overridden.

Prepaid Charging > Rating Management > Named Event Catalogue tab, select a named event catalogue and click **Edit**.

**Edit Named Event Catalogue**

Name: Gold    Include Default (Default)     Use Holiday Set: None

**Named Events**

Display Filters

Event Sets: All Sets    Include In Catalogue: Included    Max Rows: 999

Event Name:    Allowed in Catalogue: Allowed & Barred    Filter

Event Set	I	Named Event	A	Cash Cost	Time Cost (Secs)	More Info
BOOST	<input checked="" type="checkbox"/>	Boost 1 Periodic Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Boost 2 Periodic Fee	<input checked="" type="checkbox"/>	\$0.20		
	<input checked="" type="checkbox"/>	Boost 3 Periodic Fee	<input checked="" type="checkbox"/>	\$0.30		
	<input checked="" type="checkbox"/>	Boost 4 Periodic Fee	<input checked="" type="checkbox"/>	\$0.40		
	<input checked="" type="checkbox"/>	Boost 5 Periodic Fee	<input checked="" type="checkbox"/>	\$0.50		
CS	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
FD	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
FF	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.20		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
HA	<input checked="" type="checkbox"/>	HA	<input checked="" type="checkbox"/>			
Loyalty	<input checked="" type="checkbox"/>	Point	<input checked="" type="checkbox"/>	\$0.01		

View Details    Delete Overrides    Select All

**Named Event Override Configuration**

Event Name:

Override Name	Cash Cost	Time Cost (Secs)	A	General
Change Fee	\$0.10		<input checked="" type="checkbox"/>	Yes

New    Edit    Delete    Select All

Save    Save and Close    Close

## Control Plans

The following control plans (CP) are used by the CS service.

Name	Description
CS IVR - SCP	CS self-care logic. This CP is called by the overall IVR Self Care CP.
CS Activation - BPL	CS service activation logic (used by BPL).
CS Deactivation - BPL	CS service deactivation (used by BPL).
CS Change - BPL	Set or change the CS community (used by BPL).
HPLMN-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains CS voice service logic). This CP is called by the Voice CP (HPLMN-MO).

Name	Description
HPLMN-MO	HPLMN-MO control plan, which calls the “HPLMN-MO VAS Service Logic – SCP” CP.
SMS-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains CS SMS service logic). This CP is called by the SMS CP (SMS-MO).
SMS-MO	SMS-MO control plan, which calls the “SMS-MO VAS Service Logic – SCP” CP.
IVR Self Care	Overall IVR self care control plan, which calls VAS specific Self Care CPs.

## Profile Fields

The following profile fields are used by the CS service.

Name	Type	Tag	Profile Block	Usage
CS Service Active	BOOLEAN	2817001	Global Profile	Defines whether the CS service is active (globally).
CS Voice Discount Type	BOOLEAN	2817002	Global Profile	Define the discount type, for example. discount or tariff plan override.
CS Community	INTEGER	2817003	App Specific 1 CCS Temporary Profile (App 6)	The CS community the subscriber belongs to.
CS Recurring Fee	BOOLEAN	2817004	Global Profile	Defines whether a recurring fee should be applied
CS Recurring Fee Amount	INTEGER	2817005	Temporary Storage	Used during service logic processing.
CS Temp Community	INTEGER	2817009	Temporary Storage	Used during service logic processing.
CS Change Fee Amount	INTEGER	2817010	Temporary Storage	Used during service logic processing.
CS Communities in use	INTEGER	2817011	Global Profile	Defines maximum number of communities a subscriber can belong to.
CS Temp Nstring	NSTRING	2817012	Temporary Storage	Used during service logic processing.
CS Voice Discount	DISCOUNT	2817013	App Specific 2	Discount percentage for CS voice calls.
CS SMS Discount	DISCOUNT	2817014	App Specific 2	Discount percentage for CS SMSs.
CS Voice Active	BOOLEAN	2817015	Global Profile	Defines whether the CS service is active for voice calls (globally).
CS SMS Active	BOOLEAN	2817016	Global Profile	Defines whether the CS service is active for SMSs (globally).



## Notifications

The following notifications are used by the CS service.

Field	Notification text
CS Disabled	Your CS service has been disabled.
CS Extended	Your CS service has been extended.
CS Grace	Your CS grace period has started.

**Note:** Only the English text is present in the table above. Other languages will also be present on a standard NCC installation.

These notifications are used as periodic charge notifications.

## Business Process Logic

The following BPLs are used by the CS service.

Field	Description
CSCHG	Change the CS community.
CSACT	Activate the CS service for the subscriber.
CSDACT	Deactivate the CS service for the subscriber.

## Periodic Charges

The following periodic charges (PC) are used by the CS service.

Name	Usage
CS	This PC determines whether the user has subscribed to the CS service and debits the subscriber (CS Monthly Fee) every month.

This PC is assigned to all CPS product types.

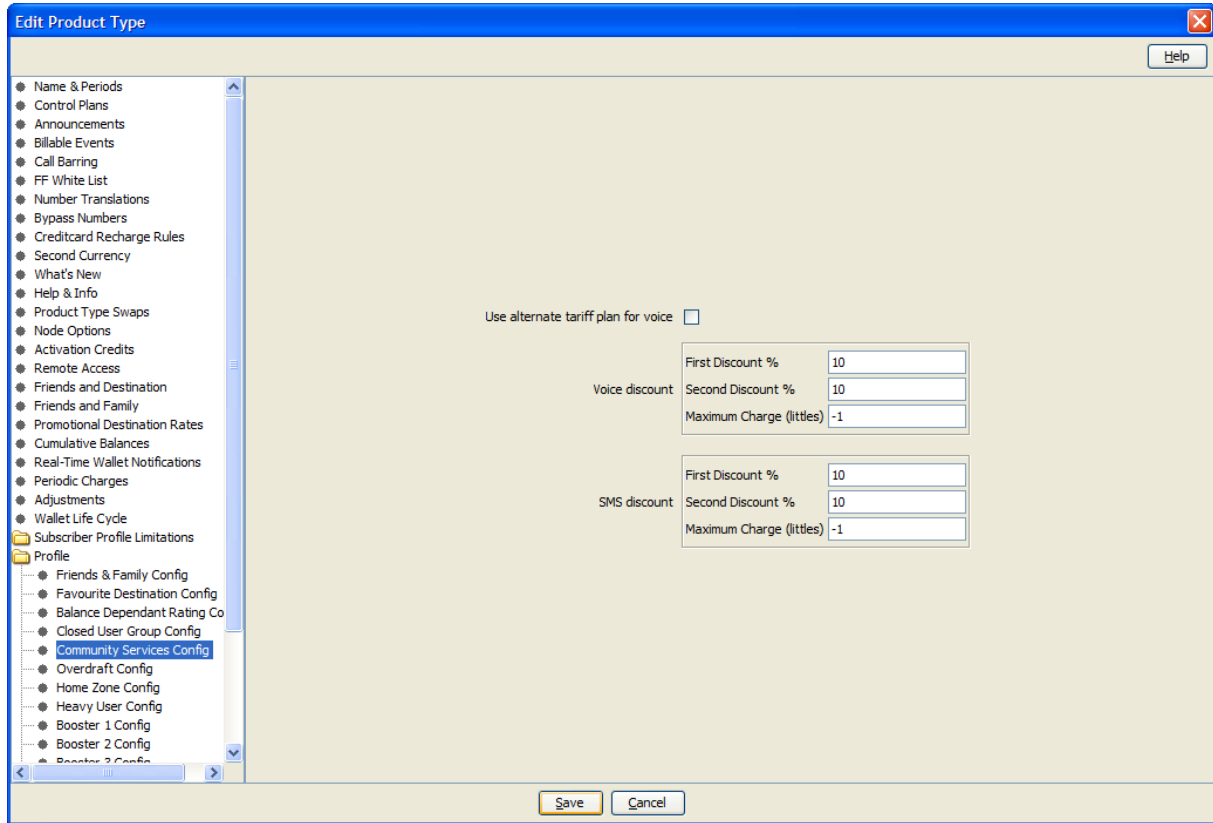
## Screens

The CS service uses two SPM custom screens:

- Product Type
- Subscriber panel.

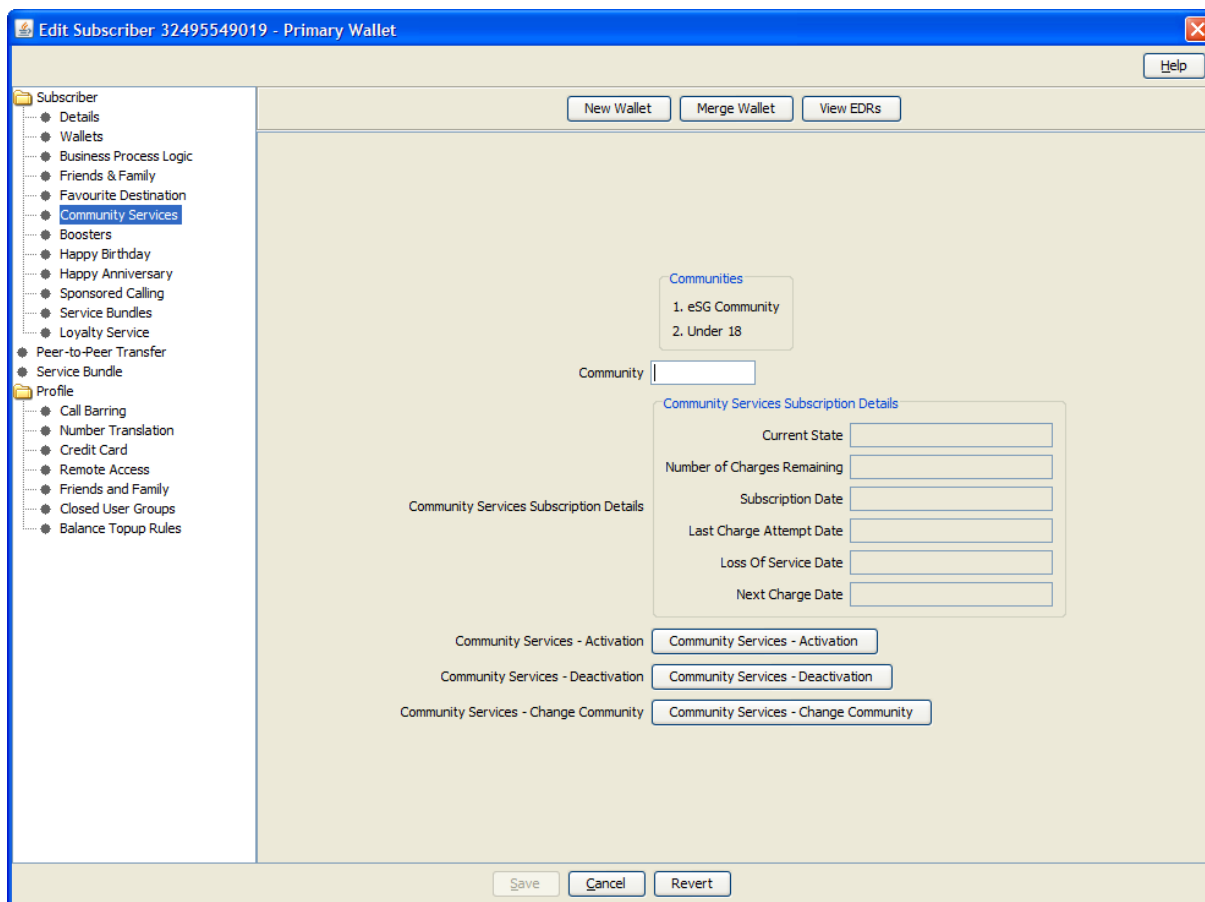
### Product Type screen

Here is an example screen.



## Subscriber screen

Here is an example screen.



## Screens Template access

A standard NCC installation creates access rights for the custom CS screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

## Service logic

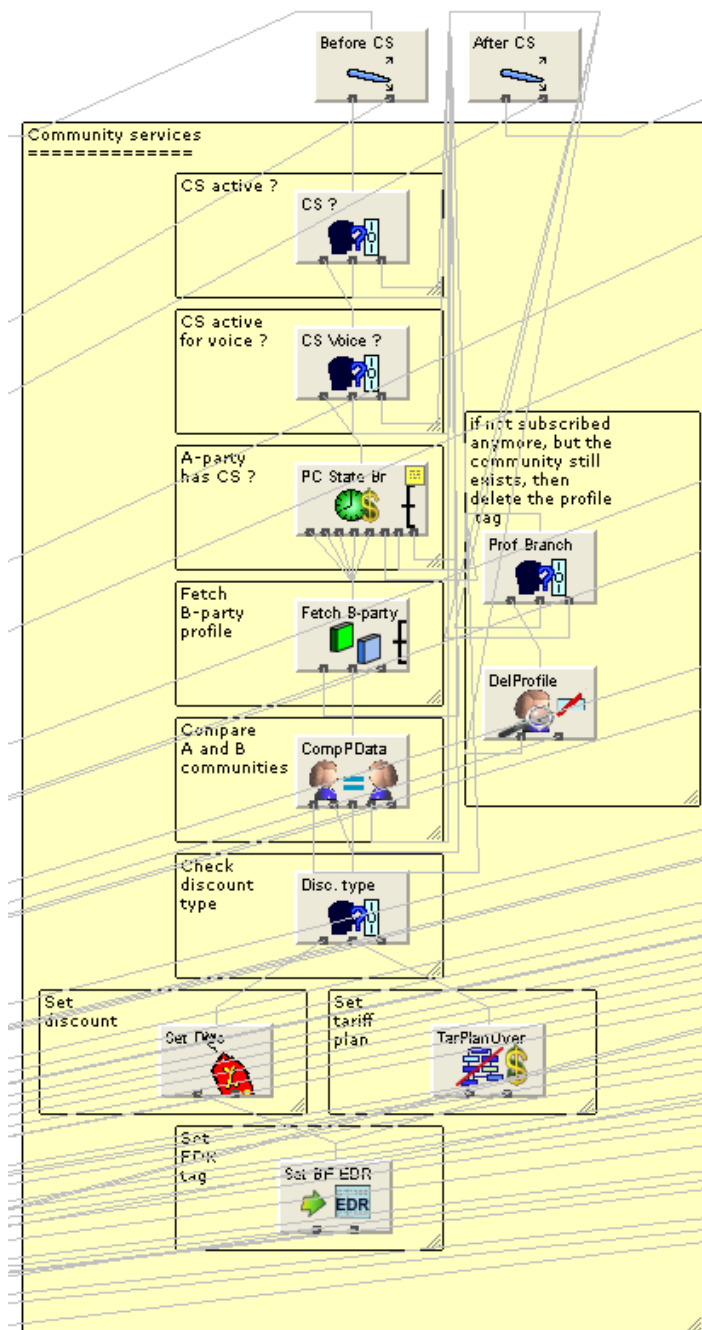
As with all VAS services, the Voice and SMS control plans each have a "VAS Service Logic" sub control plan, called respectively:

- "HPLMN-MO VAS Service Logic – SCP"
- "SMS-MO VAS Service Logic – SCP"

These "VAS Service Logic" control plans contain the service logic for this service, and are only used for HPLMN-MO and SMS-MO capabilities.

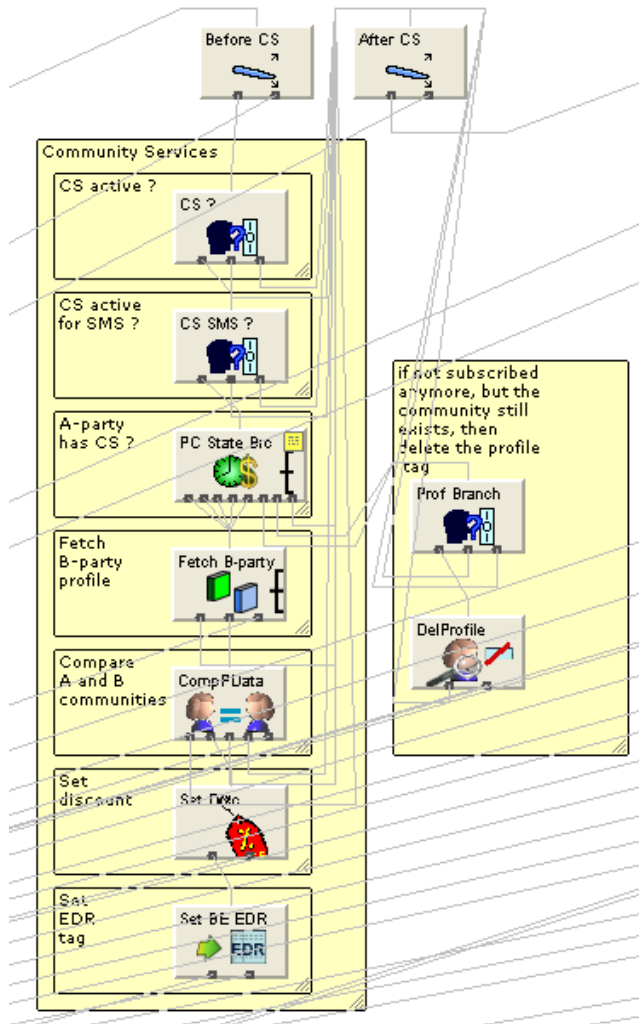
**Voice**

The Voice CS service logic has both the Discount and the Tariff Plan Override functionality, and looks like this.



## SMS

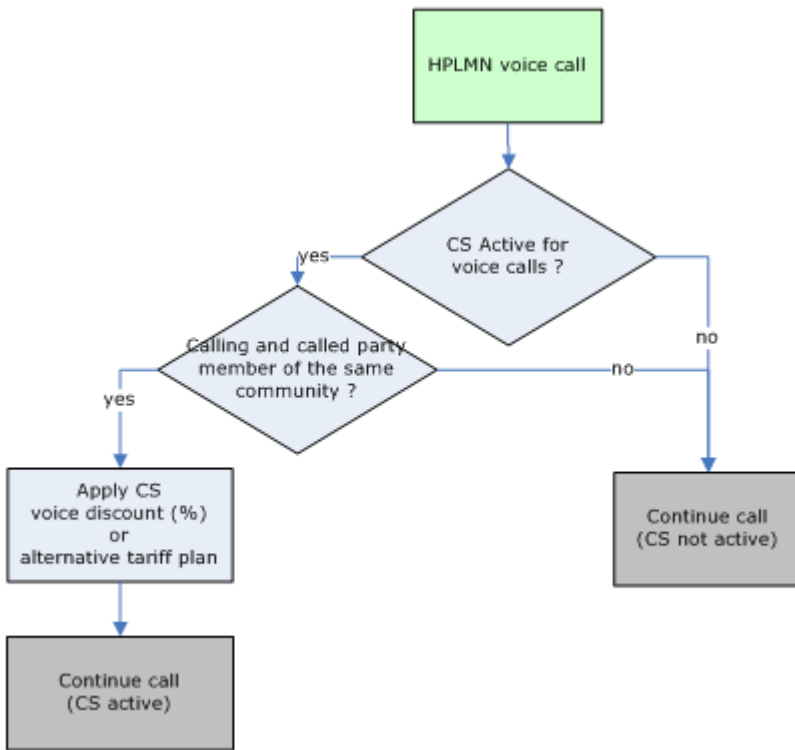
The SMS CS service logic only has the Discount functionality, and looks like this.



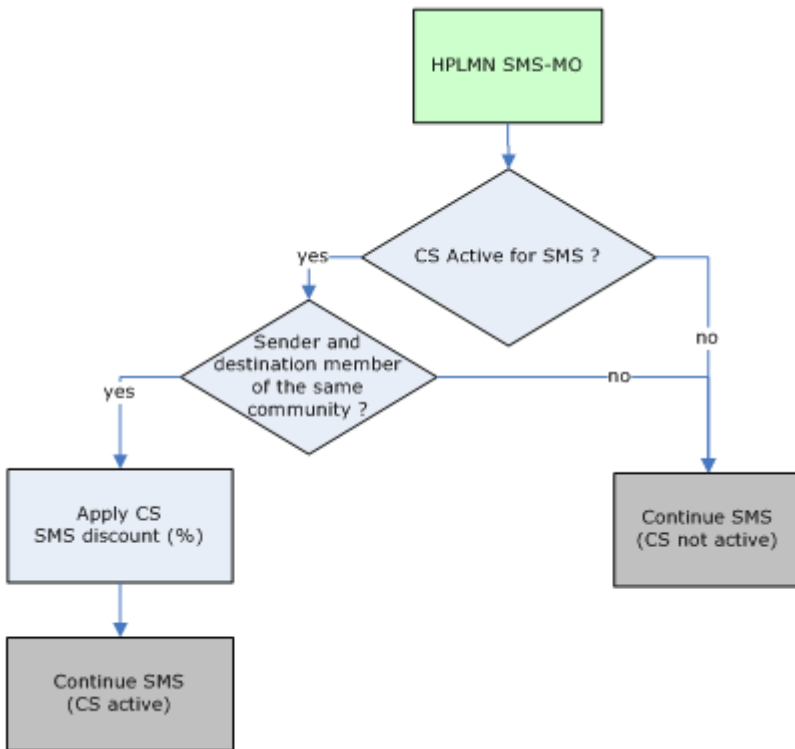
## Flow charts

The flow charts below provide more information on how the CS service will function for the different call scenarios.

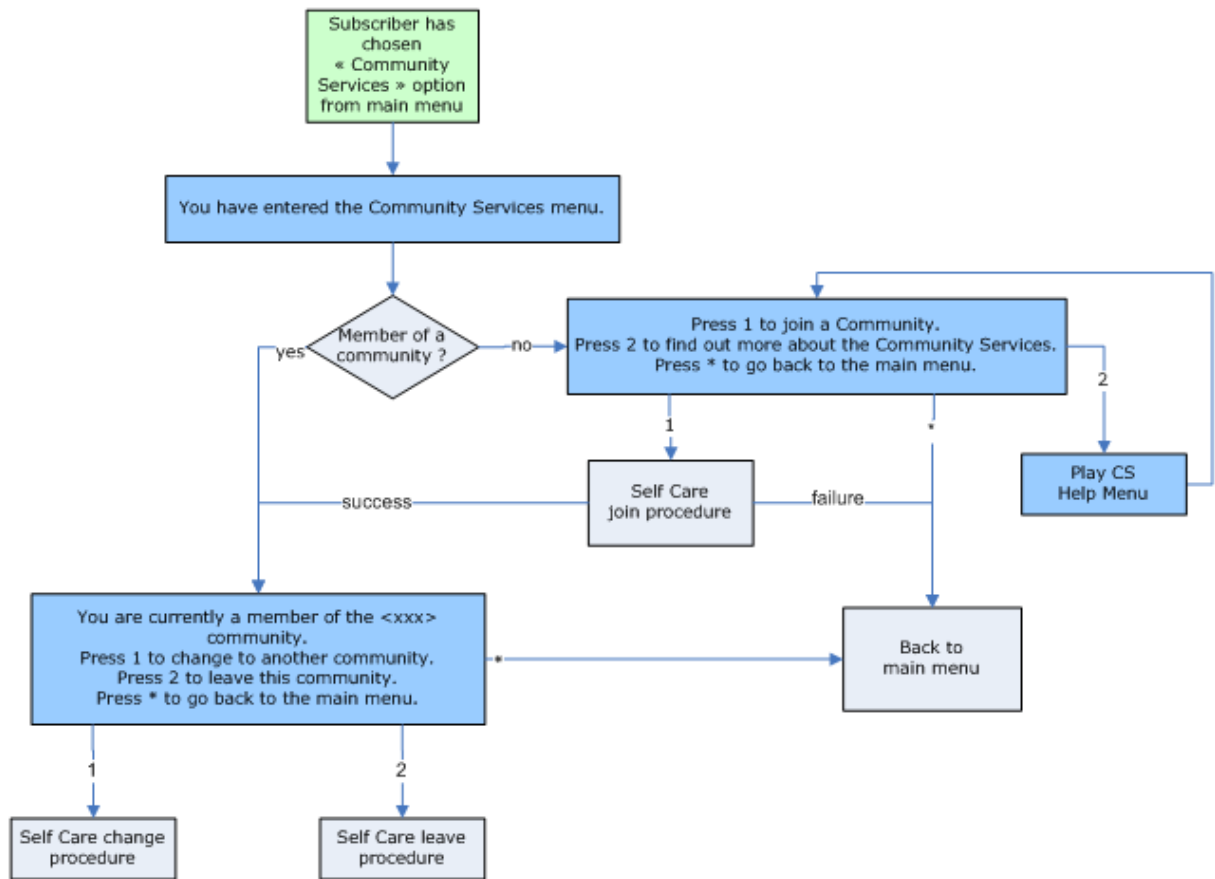
### HPLMN Voice



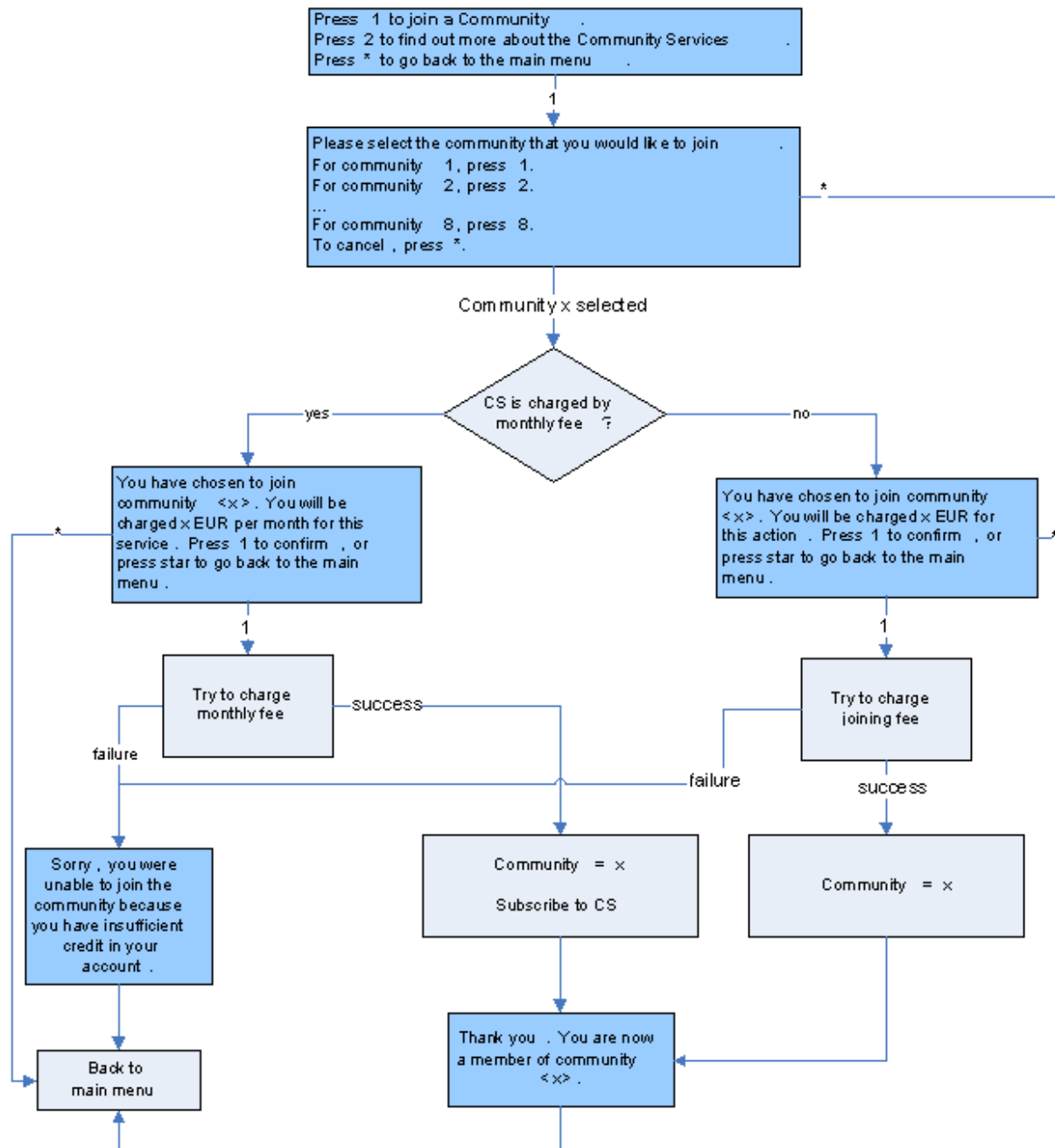
### HPLMN SMS-MO



## Self Care

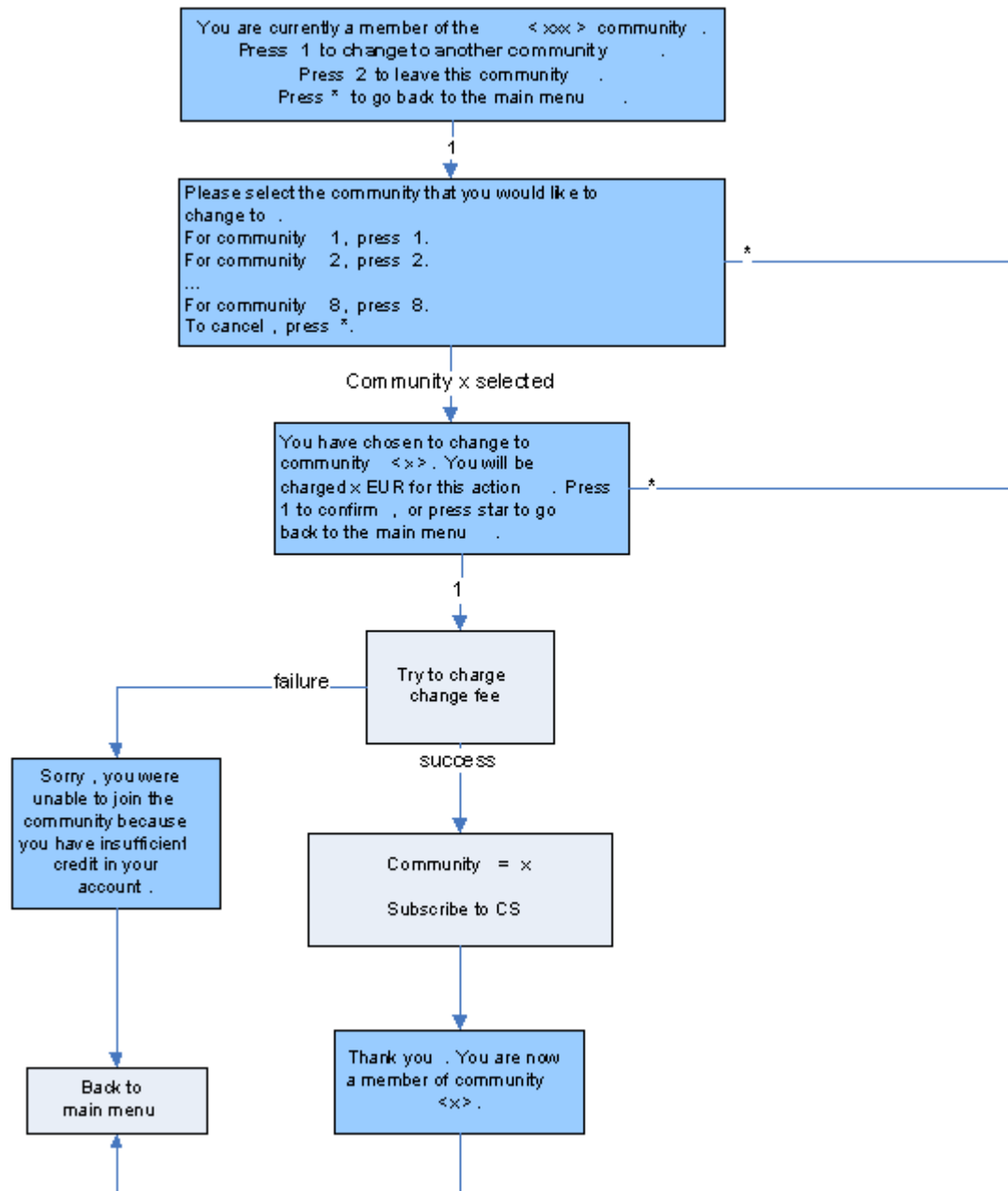


Joining/leaving a community

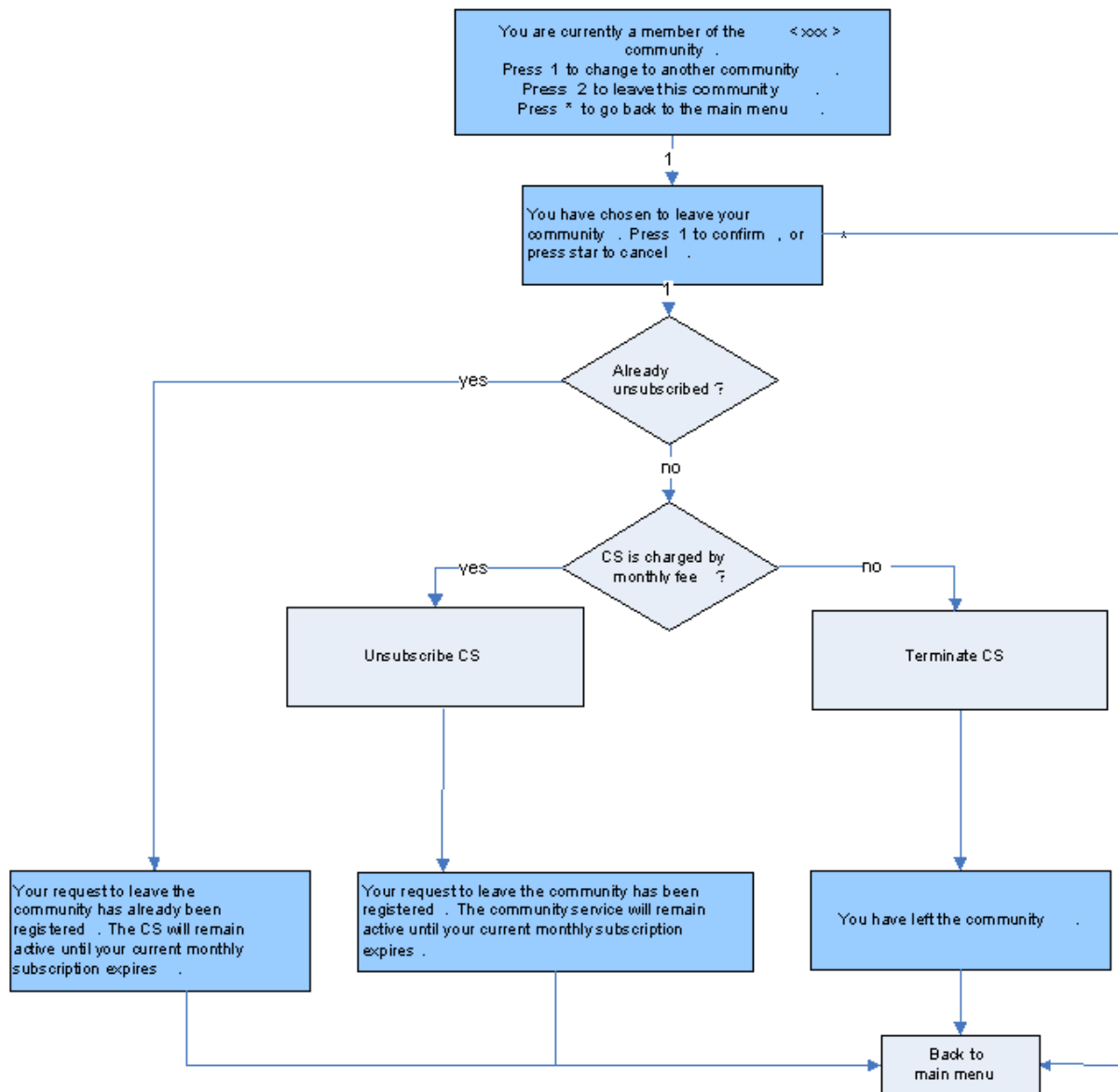




## Change community - cs



Leave community



## Overdraft

### Introduction

The overdraft facility (OD) allows the user to use their phone when out of credit. The overdraft may be used only for a restricted set of services – such as calling on-net or calling national. When a user does top-up credit, the overdraft amount will be subtracted from the credit put onto the account.

The operator must define the number of calls that a user is allowed in the overdraft and the maximum duration of each overdraft call. Once the subscriber is using their overdraft, an optional alternative tariff can be used where the tariff will be more expensive than the users' normal rates.

The operator is able to define:

- Which destinations will be available to the OD service (On-Net, Off-Net, National Fixed, International).

- The number of calls allowed in OD.
- Maximum duration of an OD call.
- OD Rate.

## Tariff Plan

Three OD-specific tariff plans (with associated rates) are available - one for each product type.

## Balance Types

The following balance types are used by the OD service.

Name	Type	Units	Usage
Overdraft counter	Charge	SMS	Tracks the number of Overdraft calls left.

Additionally; an “Overdraft” balance type cascade is created, which consists of only this “Overdraft Counter” balance type. Each time a call is placed, when in OD mode, this Overdraft counter is decreased.

## Named Events

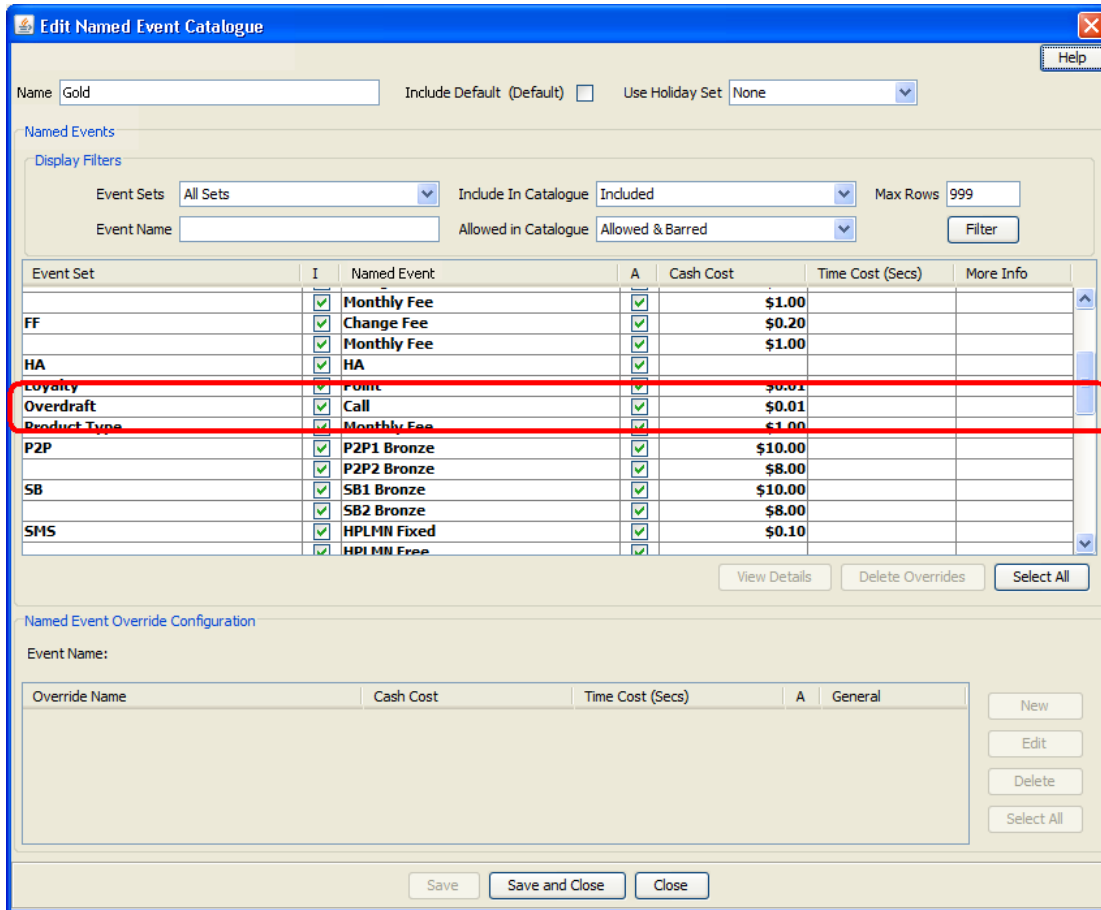
The following named events are used by the OD service.

Field	Class	Description
Call	Overdraft	The cost of 1 Overdraft call. Used to decrease the overdraft counter.

## Example Event Set

These events are assigned to a product type specific named event catalogue, where they are overridden.

Prepaid Charging > Rating Management > Named Event Catalogue tab, select a named event catalogue and click Edit.



## Control Plans

The following control plans (CP) are used by the OD service.

Name	Description
HPLMN-MO Service Overdraft SCP	Overdraft logic. This CP gets called by the HPLMN-MO control plan.
HPLMN-MO	HPLMN-MO control plan, which calls the "HPLMN-MO Service Overdraft SCP" CP.

## Profile Fields

The following profile fields are used by the OD service.

Name	Type	Tag	Profile Block	Usage
OD Service Active	BOOLEAN	2818001	App Specific 2	Defines whether the OD service is active (product type).
OD Override Tariffplan	BOOLEAN	2818002	App Specific 2	Defines whether an OD tariff plan should be used.

Name	Type	Tag	Profile Block	Usage
OD Onnet Allowed	BOOLEAN	2818003	App Specific 2	Defines whether on-net calls are allowed.
OD Offnet Allowed	BOOLEAN	2818004	App Specific 2	Defines whether off-net calls are allowed.
OD Fixed Allowed	BOOLEAN	2818005	App Specific 2	Defines whether national fixed calls are allowed.
OD International Allowed	BOOLEAN	2818006	App Specific 2	Defines whether international calls are allowed.

## Bonuses

An Overdraft Bonus is created, for each product type, which will be triggered on a Balance Recharge operation. This Bonus will reset the Overdraft Counter.

This reset operation reward is also automatically added to all other Voucher Types, and PI Bonuses.

## Activation credit promotions

The following activation credits (AC) will be used by the OD service.

Name	Usage
Bronze Activation	An OD counter reset reward will be added to the Bronze Activation promotion (AC).
Silver Activation	An OD counter reset reward will be added to the Silver Activation promotion (AC).
Gold Activation	An OD counter reset reward will be added to the Gold Activation promotion (AC).

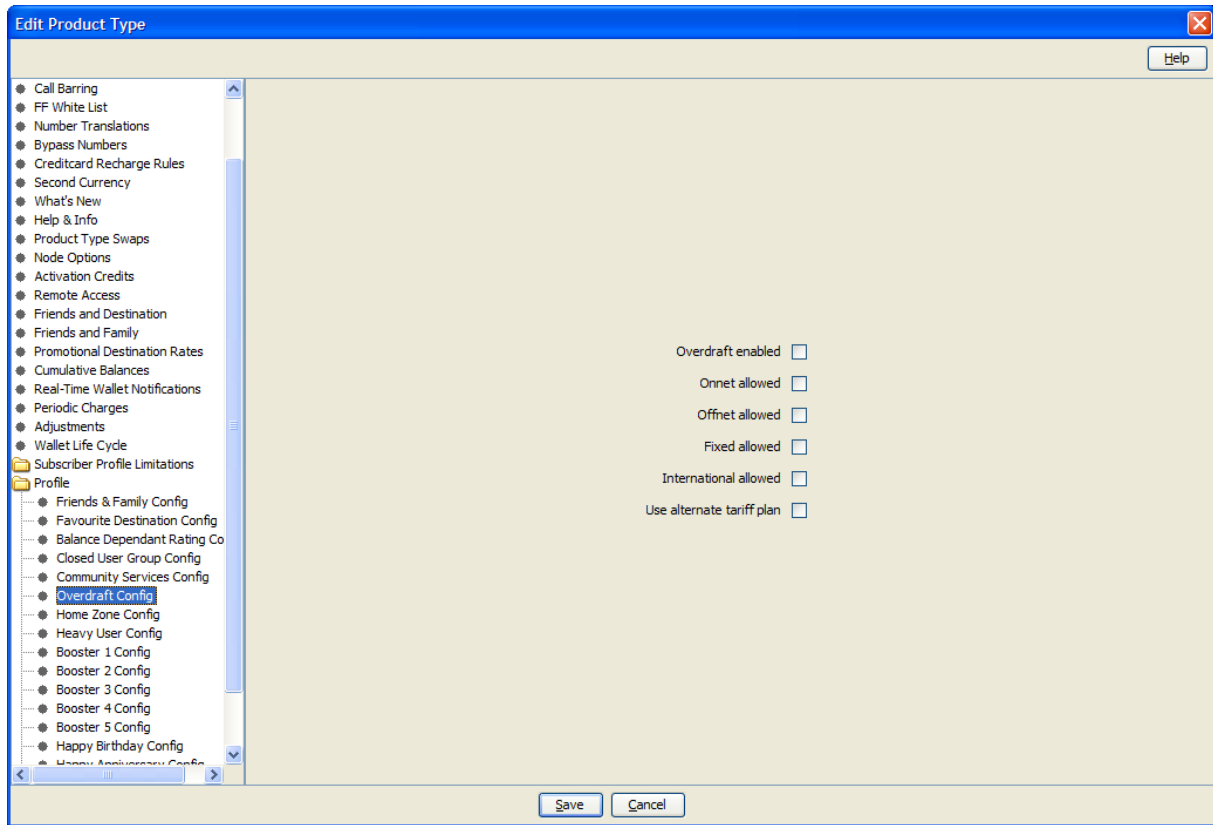
## Screens

The OD service uses one SPM custom screen:

- Product Type

### Product Type screen

Here is an example screen.



### Screens Template access

A standard NCC installation creates access rights for the custom OD screens, for the following users:

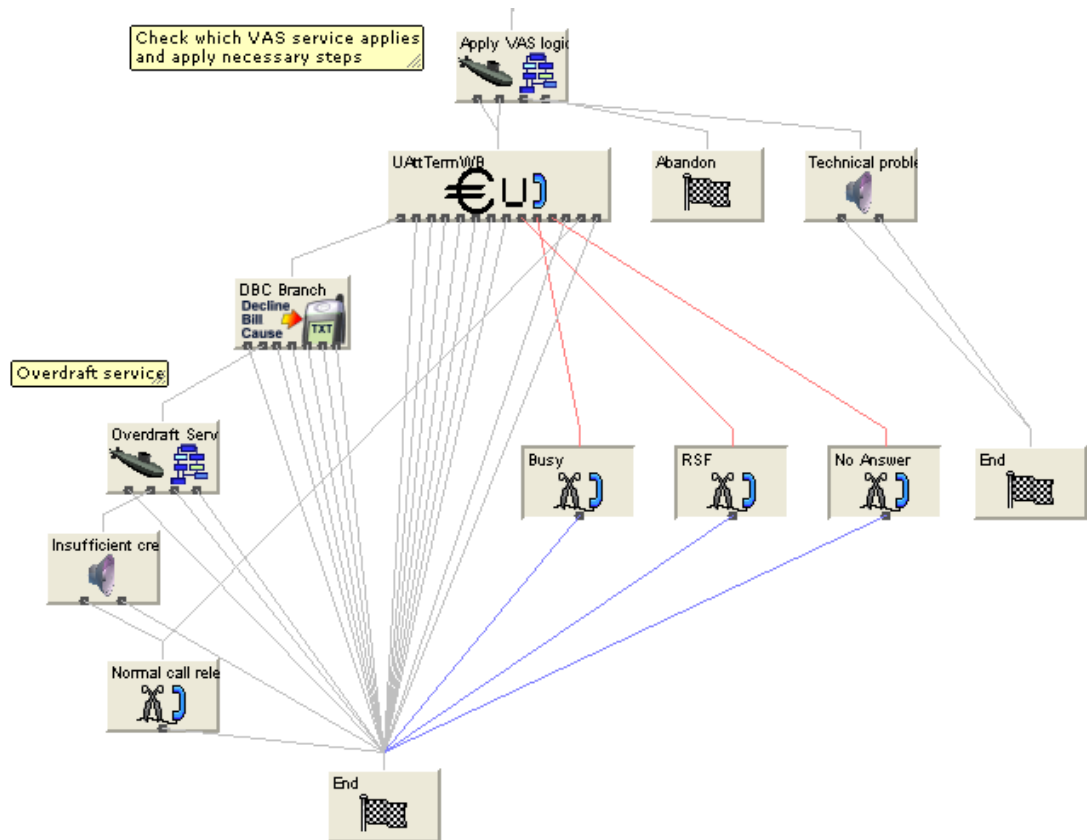
- “Operator”
- “Administrator”

### Service logic

As with all VAS services, the Voice control plan will have a “VAS Service Logic” sub control plan, called “HPLMN-MO VAS Service Logic – SCP”. After all this VAS logic has been processed, we return to the HPLMN-MO CP, which will continue by attempting to bill for the call.

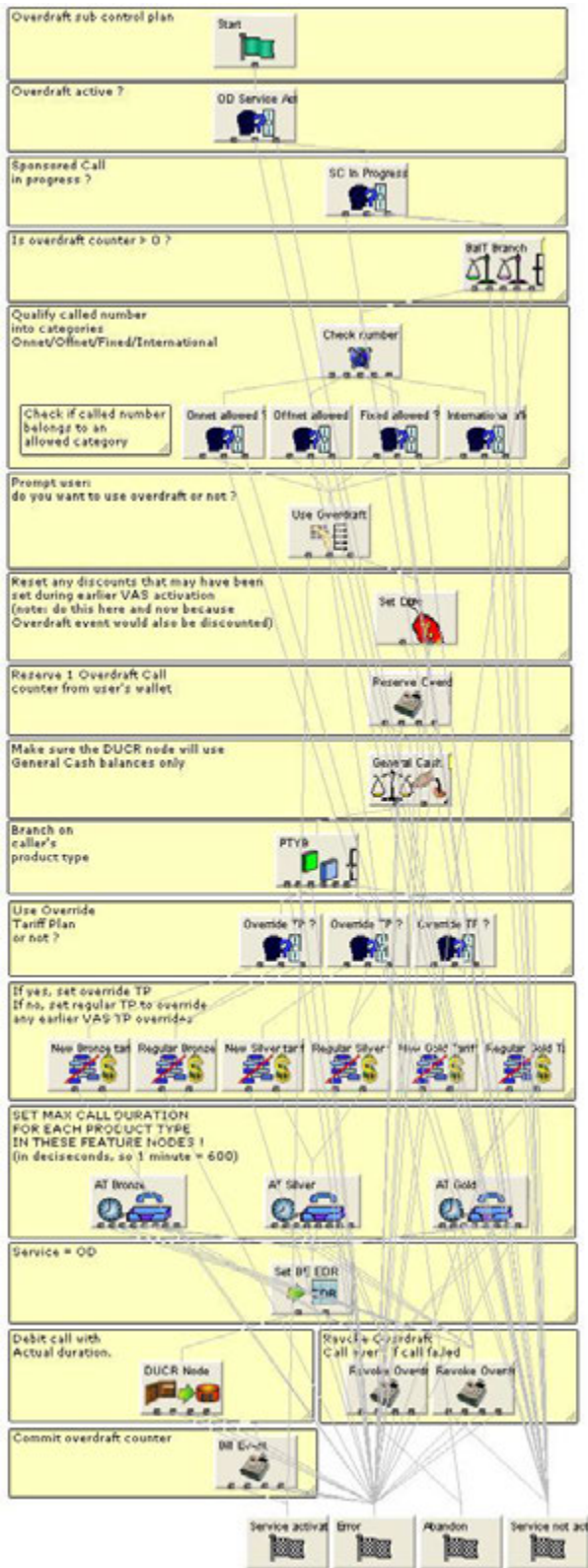
If billing is unsuccessful because the subscriber has run out of funds, the Overdraft Logic (“HPLMN-MO Service Overdraft SCP” CP) is invoked.

Control Plan



### Overdraft service sub control plan

The Overdraft service logic then looks like this.

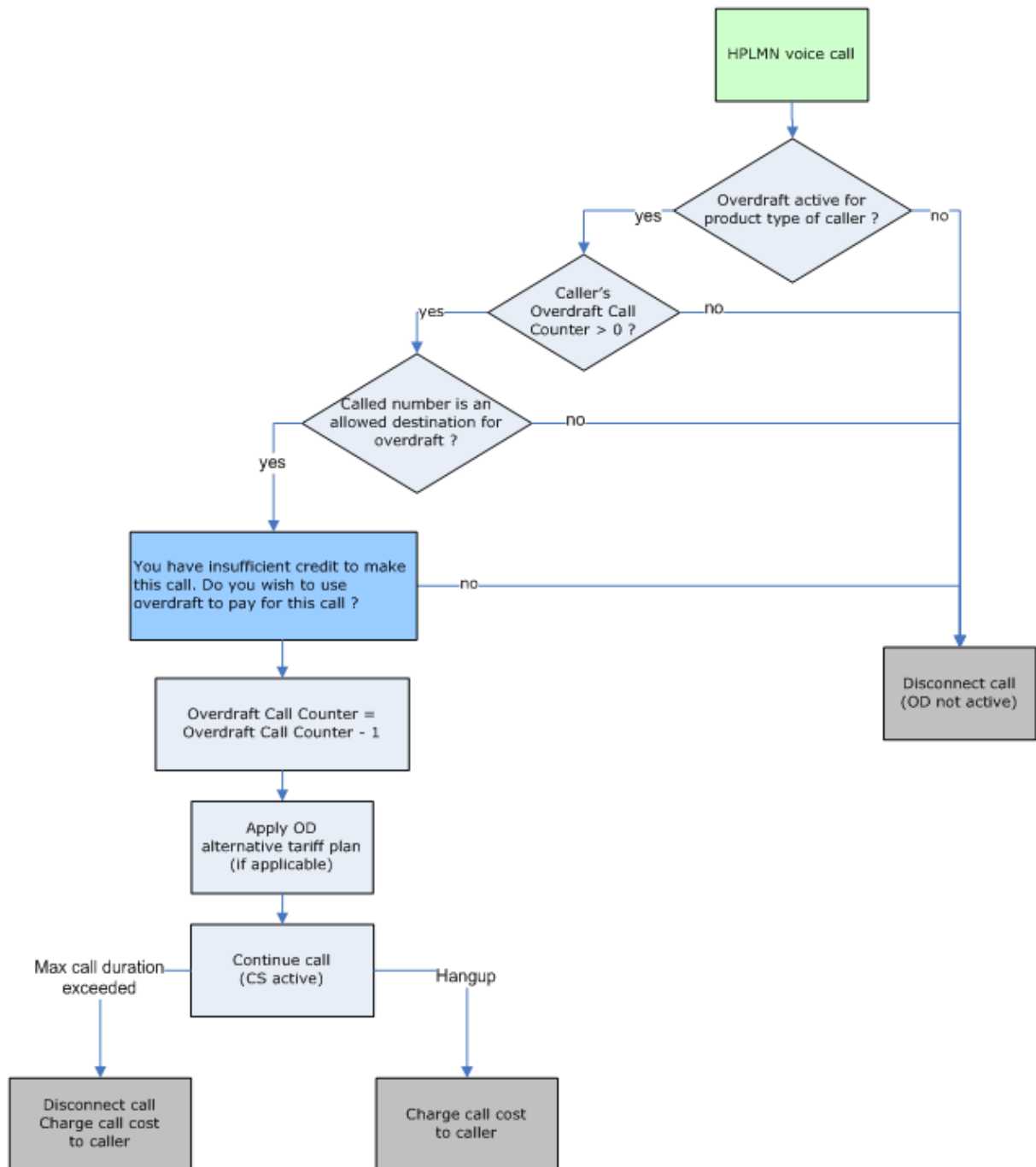




## Flow charts

The flow chart below provides more information on how the OD service will function for the different call scenarios.

### Overdraft



# Home Zone

## Introduction

The Home Zone (HZ) service enables the subscriber to receive a discount when using the operator's services from fixed locations.

A subscriber can nominate up to nine different areas as preferred zones. You can offer the subscriber a discount when calling from within one of these zones, and you can also offer them a discount if the person who is receiving the subscriber's call is on-net in one of the nominated zones.

The ability to define up to nine different zones allows multiple location services to be offered. Here are some examples:

- Home Zone
- Office Zone
- School Zone
- Family Member Zone
- Friend Zone

A HZ Self Care service is also available. For more information on HZ Self Care, see Prepaid Charging Service Template - Self Care.

## Control Plans

The following control plans (CP) are used by the HZ service.

Name	Description
HZ IVR - SCP	HZ Self-Care logic. This CP is called by the overall IVR Self Care CP.
HPLMN-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains HZ Voice service logic). This CP is called by the Voice CP (HPLMN-MO)
HPLMN-MO	HPLMN-MO control plan, which calls the “HPLMN-MO VAS Service Logic – SCP” CP.
IVR Self Care	Overall IVR Self Care control plan, which calls VAS specific Self Care CPs.

## Profile Fields

The following profile fields are used by the HZ service.

Name	Type	Tag	Profile Block	Usage
Home	ZONE	4128770	-	LCP Zone 1
Work	ZONE	4128771	-	LCP Zone 2
Zone Home3	ZONE	4128773	App Specific 1	LCP Zone 3
Zone Home4	ZONE	4128774	App Specific 1	LCP Zone 4
Zone Home5	ZONE	4128775	App Specific 1	LCP Zone 5
Zone Home6	ZONE	4128776	App Specific 1	LCP Zone 6
Zone Home7	ZONE	4128777	App Specific 1	LCP Zone 7
Zone Home8	ZONE	4128778	App Specific 1	LCP Zone 8
Zone Home9	ZONE	4128779	App Specific 1	LCP Zone 9

Name	Type	Tag	Profile Block	Usage
HZ Service Active	BOOLEAN	2819000	App Specific 2	Defines whether the HZ service is active (product type).
HZ Number Of Zones	INTEGER	2819001	Global Profile	Defines the number of zones.
HZ Discount A In Zone	DISCOUNT	2819002	App Specific 2	Discount percentage if A in the zone.
HZ Discount B In Zone	DISCOUNT	2819003	App Specific 2	Discount percentage if B in the zone.
HZ Discount A+B In Zone	DISCOUNT	2819004	App Specific 2	Discount percentage if both A and B in the zone.

**Notes:**

- The first two zones are already installed by the LCP software, and will not be installed by APE.
- All these zones will have the “LCP ZONES” profile field (also installed by the LCP software) as parent.

**Screens**

The HZ service uses one SPM custom screen:

- Product Type

**Product Type screen**

Here is an example screen.

The screenshot shows the 'Edit Product Type' window with a tree view on the left and configuration fields on the right. The tree view includes categories like 'Bypass numbers', 'Profile', and 'Subscriber Profile Limitations'. Under 'Profile', 'Home Zone Config' is selected. The configuration fields are as follows:

Option	Home Zone enabled	Discount A in Zone	Discount B in Zone	Discount A+B in Zone
Home Zone enabled	<input type="checkbox"/>	First Discount %: 10	First Discount %: 10	First Discount %: 30
Discount A in Zone		Second Discount %: 20	Second Discount %: 20	Second Discount %: 40
Discount A in Zone		Maximum Charge (littles): -1	Maximum Charge (littles): -1	Maximum Charge (littles): -1

Buttons for 'Save' and 'Cancel' are located at the bottom of the window.

### Screens Template access

A standard NCC installation creates access rights for the custom HZ screens, for the following users:

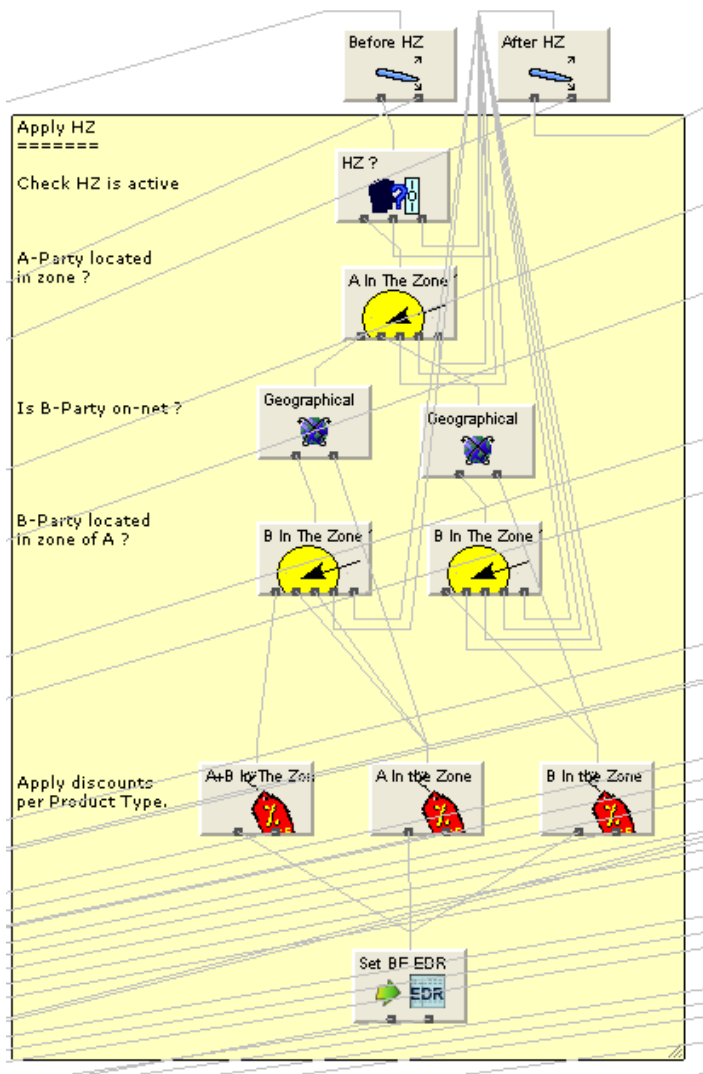
- “Operator”
- “Administrator”

### Service logic

As with all VAS services, the Voice control plan will have a “VAS Service Logic” sub control plan, called “HPLMN-MO VAS Service Logic – SCP”. This “VAS Service Logic” control plan will contain the HZ service logic, and is only used for the HPLMN-MO capability.

### Voice

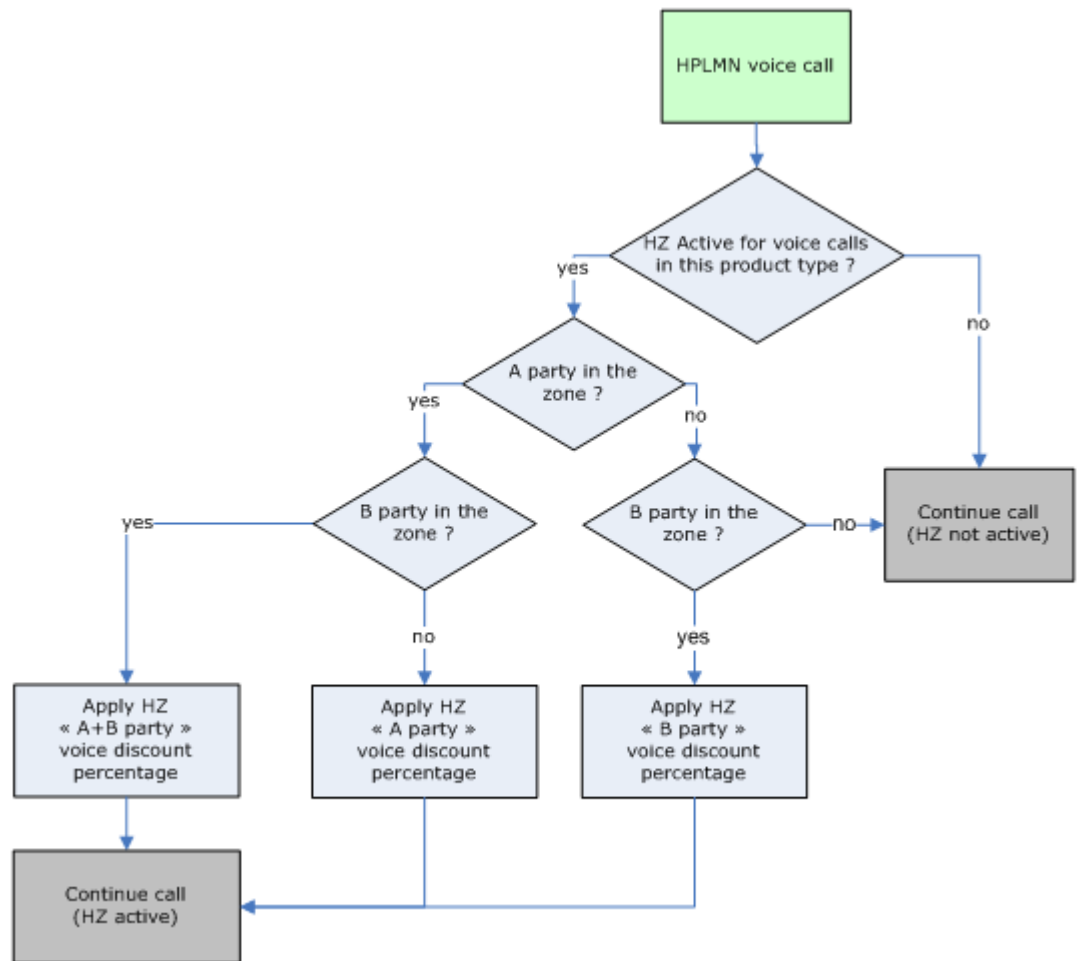
The Voice service logic looks like this.



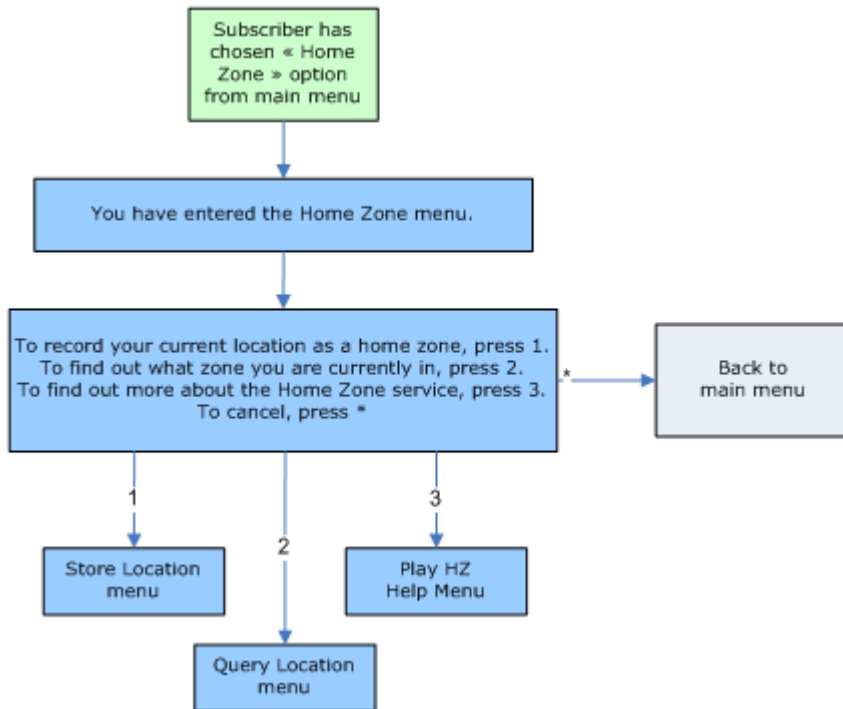
### Flow charts

The flow chart below provides more information on how the HZ service will function for the different call scenarios.

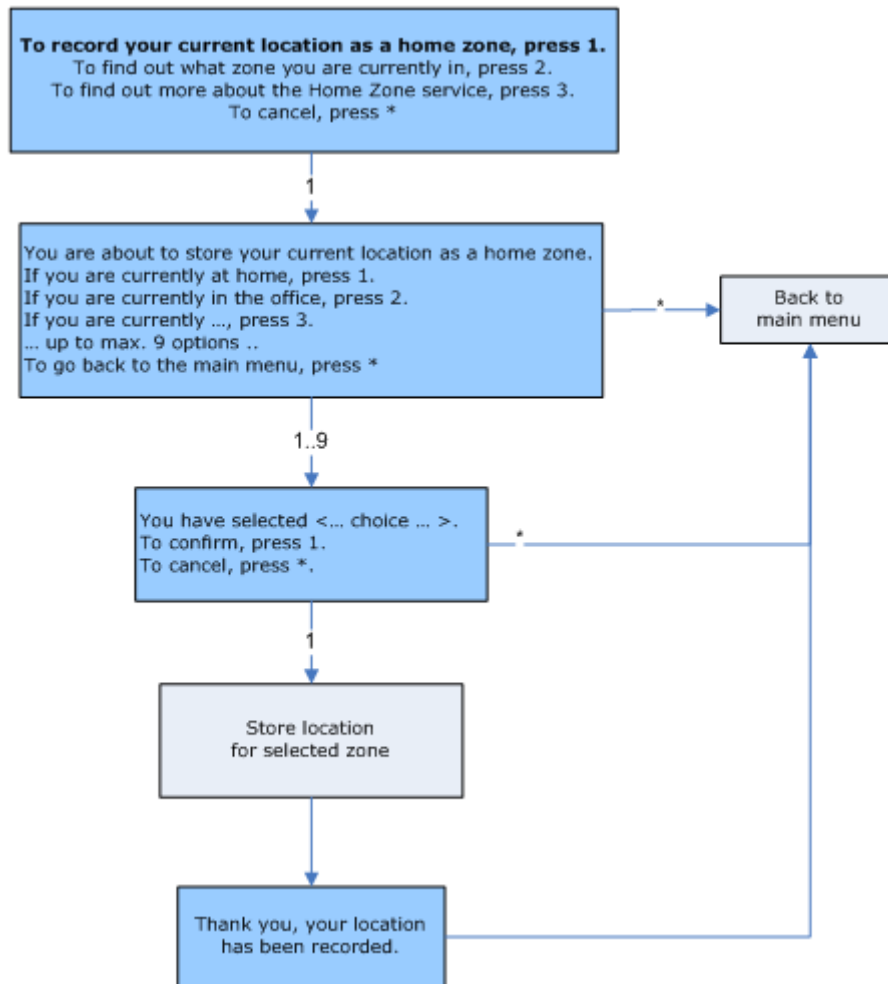
## HPLMN Voice



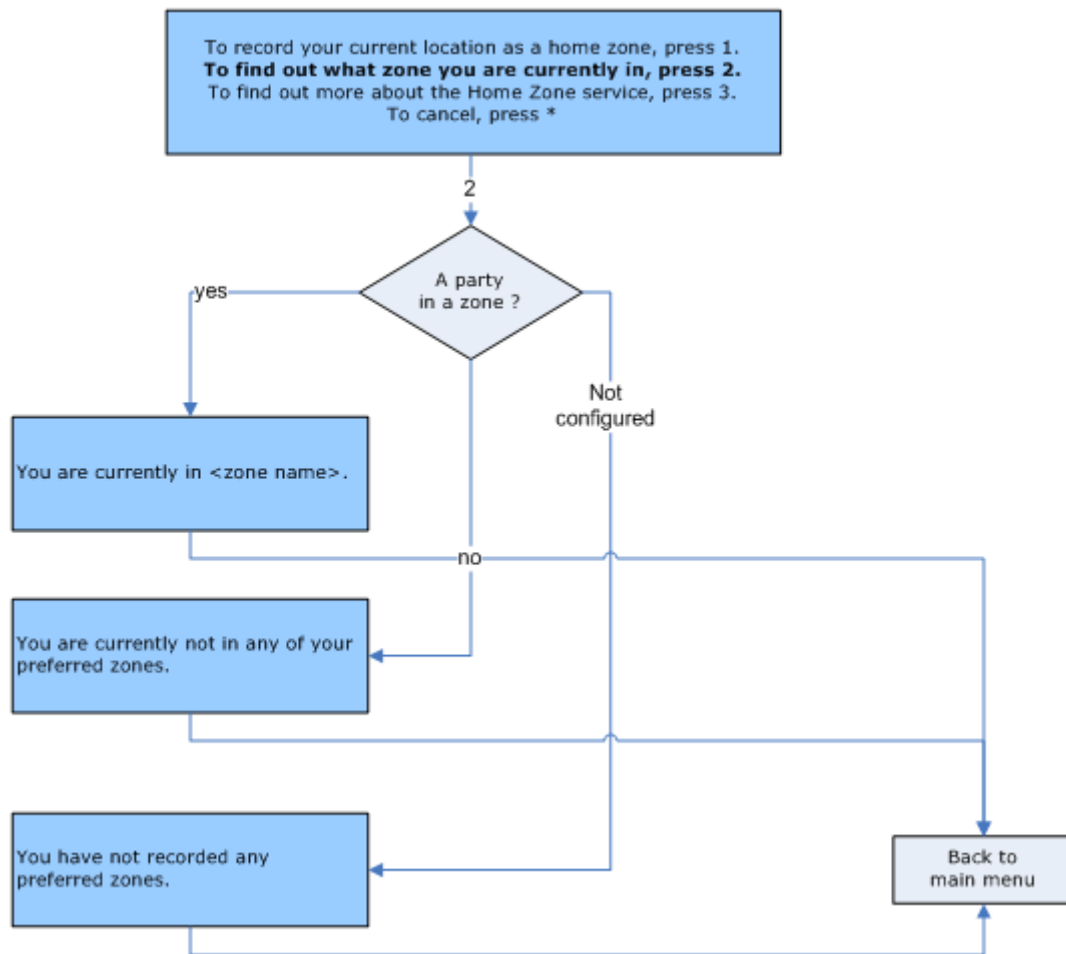
Self Care



## Store Location



## Query Location



## Heavy User

### Introduction

The Heavy User (HU) service enables the subscriber to receive higher rates of discount on reaching a spending threshold during a period. In order to trigger this new tariff, a predefined amount of credit must be used by the subscriber on the nominated services.

The operator defines the length of the period for the cycle of the service to be carried out. The operator also defines which calling scenarios will be included in the scheme, for example on-net calls, national calls, international calls.

When this has been established, the operator needs to set an amount of credit which needs to be consumed before receiving a heavy user discount – this can be in the currency of the subscriber (for example, 20 EUR), it can be a time limit (for example 3 hours of call time), or it can be a call counter (for example 50 calls). When the user has reached this target, he will be given a discount for the remainder of the period.

Multiple tiers may be offered to reward very heavy users. The operator can distinguish to which product type this service is available, for example it may only be available to 'gold users'.

The operator is able to define:



- Which type of destination will be eligible for FF nomination (On-net, Off-net, National Fixed, International).
- The length of the period for the cycle of the service to be carried out.
- The cost (number of calls, money, time ...) which needs to be consumed before the discount will become active.

The HU service, as part of a standard NCC installation, uses 3 levels of discount, each with their own threshold.

A HU Self-Care service is also available. For more information on the HU Self-Care, see Prepaid Charging Service Template - Self Care.

## Balance Types

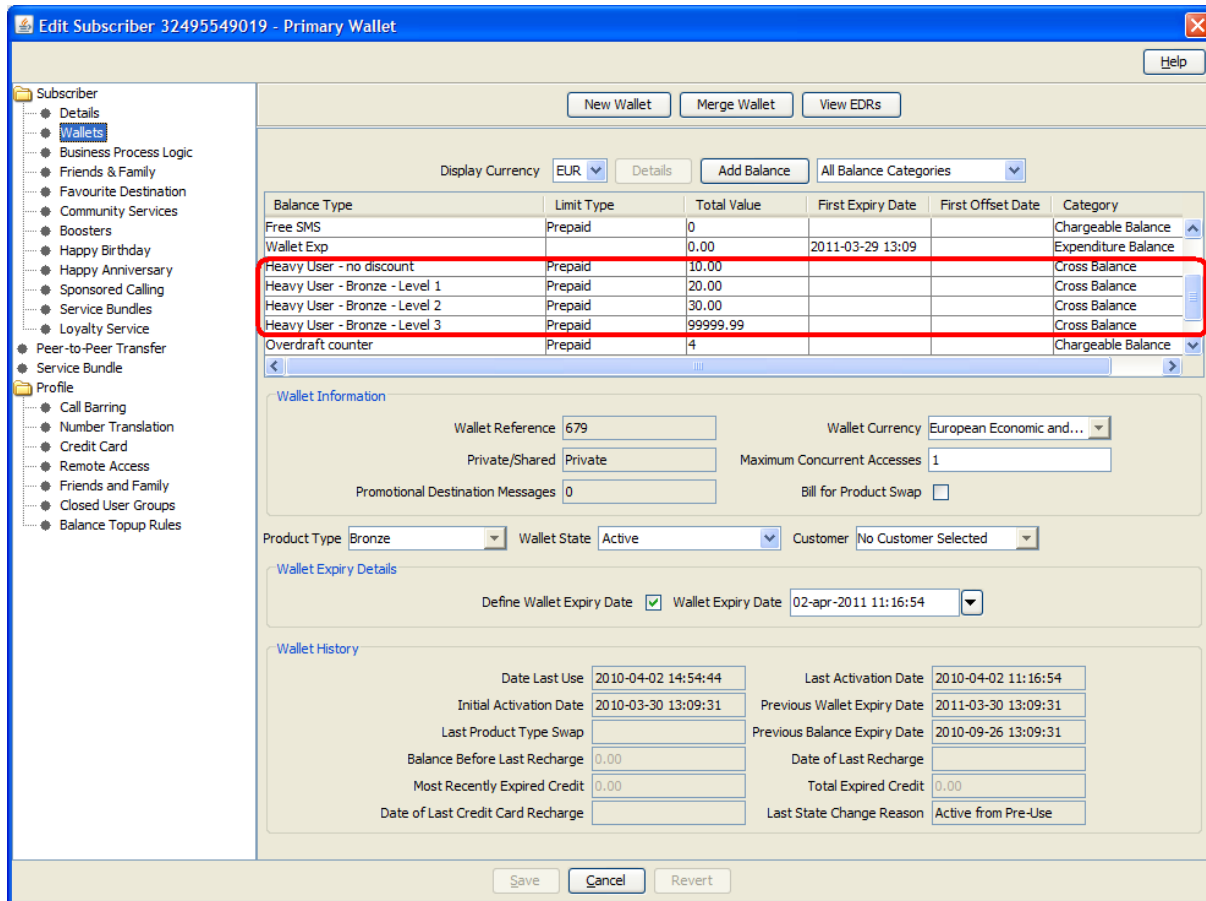
The following balance types are used by the HU service.

Name	Type	Units	Usage
Heavy User – no discount	XBT	Cash	Cross Balance Type to cover initial period (no discount).
Heavy User – Bronze – Level 1	XBT	Cash	Cross Balance Type to track Level 1 discount (Bronze product type).
Heavy User – Bronze – Level 2	XBT	Cash	Cross Balance Type to track Level 2 discount (Bronze product type).
Heavy User – Bronze – Level 3	XBT	Cash	Cross Balance Type to track Level 3 discount (Bronze product type).
Heavy User – Silver – Level 1	XBT	SMS	Cross Balance Type to track Level 1 discount (Silver product type).
Heavy User – Silver – Level 2	XBT	SMS	Cross Balance Type to track Level 2 discount (Silver product type).
Heavy User – Silver – Level 3	XBT	SMS	Cross Balance Type to track Level 3 discount (Silver product type).
Heavy User – Gold – Level 1	XBT	Time	Cross Balance Type to track Level 1 discount (Gold product type).
Heavy User – Gold – Level 2	XBT	Time	Cross Balance Type to track Level 2 discount (Gold product type).
Heavy User – Gold – Level 3	XBT	Time	Cross Balance Type to track Level 3 discount (Gold product type).

**Note:** The unit type can be Cash/SMS/Time, and can be chosen at install time.

### Example Wallet

Here is an example screen showing the Balance Types.



Additionally, a “Heavy User” cross balance type cascade is created, for every product type, which consists of the following balance types:

- Heavy User – no period
- Heavy User – Level 1
- Heavy User – Level 2
- Heavy User – Level 3

If the Heavy User service is installed, the HPLMN-MO tariffs will be updated to include these “Heavy User” XBT cascades.

### Control Plans

The following control plans (CP) are used by the HU service.

Name	Description
HU IVR - SCP	HU Self-Care logic. This CP is called by the overall IVR Self Care CP.
IVR Self Care	Overall IVR Self Care control plan, which calls VAS specific Self Care CPs.

## Profile Fields

The following profile fields are used by the HU service.

Name	Type	Tag	Profile Block	Usage
HU Service Active	BOOLEAN	2822000	App Specific 2	Defines whether the HU service is active. (Used in IVR self-care).
HU Discount Level 1	INTEGER	2822004	App Specific 2	Discount percentage Level 1. (Used in IVR self-care).
HU Discount Level 2	INTEGER	2822005	App Specific 2	Discount percentage Level 2. (Used in IVR self-care).
HU Discount Level 3	INTEGER	2822006	App Specific 2	Discount percentage Level 3. (Used in IVR self-care).

## Recharge Types

The following recharge types (RT) are used by the HU Service.

Name	Usage
Heavy User - Bronze	This RT is used to reset the HU cross balance types for Bronze subscribers (Bronze balance types).
Heavy User - Silver	This RT is used to reset the HU cross balance types for Silver subscribers (Silver balance types).
Heavy User - Gold	This RT is used to reset the HU cross balance types for Gold subscribers (Gold balance types).

## Periodic Charges

The following periodic charges (PC) are used by the HU service.

Name	Usage
Heavy User - Bronze	This PC uses the “Heavy User – Bronze” RT to reset the Bronze HU XBTs, and is assigned to the Bronze product type.
Heavy User - Silver	This PC uses the “Heavy User – Silver” RT to reset the Silver HU XBTs, and is assigned to the Silver product type.
Heavy User - Gold	This PC uses the “Heavy User – Gold” RT to reset the Gold HU XBTs, and is assigned to the Gold product type.

## Activation Credit Promotions

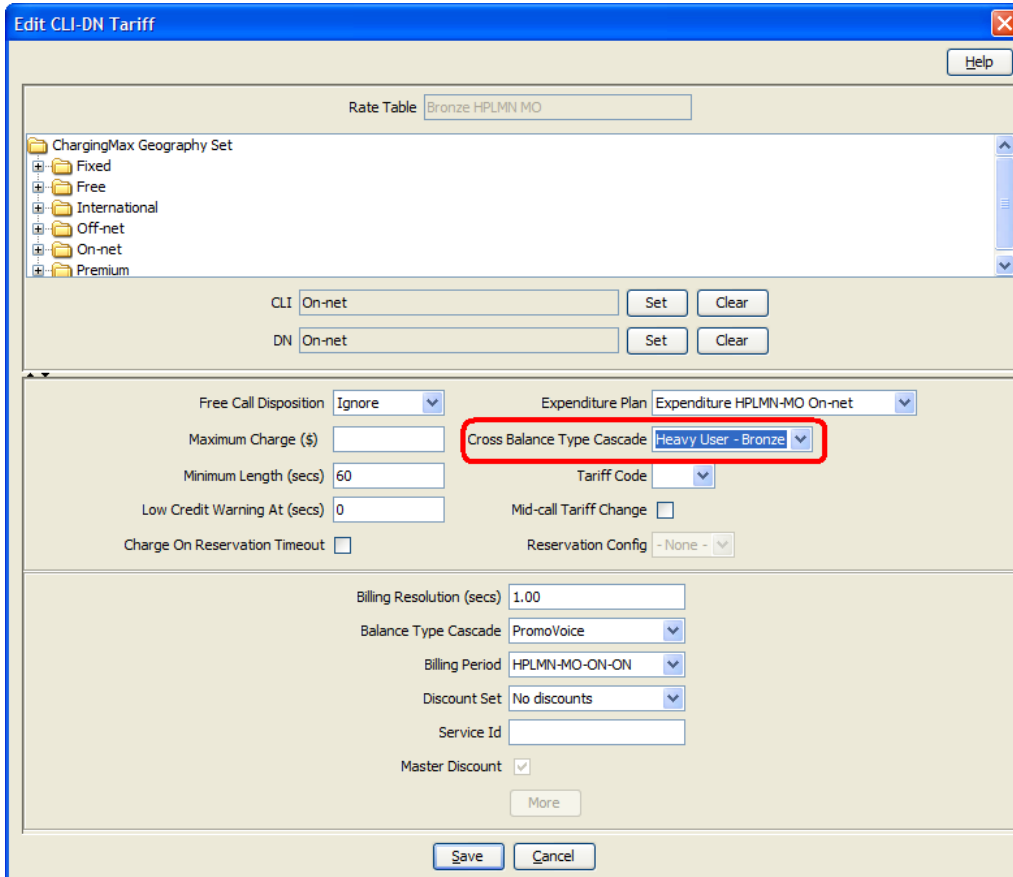
The following activation credits (AC) will be used by the HU service.

Name3	Usage
Bronze Activation	Bronze HU Balance Type reset rewards will be added to the Bronze Activation promotion (AC).
Silver Activation	Silver HU Balance Type reset rewards will be added to the Silver Activation promotion (AC).

Name3	Usage
Gold Activation	Gold HU Balance Type reset rewards will be added to the Gold Activation promotion (AC).

### Cross Balance Type Tracking

The HU XBT cascades will be assigned to the CLI-DN pairs to enable XBT tracking. Which tariff plans use the XBT functionality is configurable by the operator.



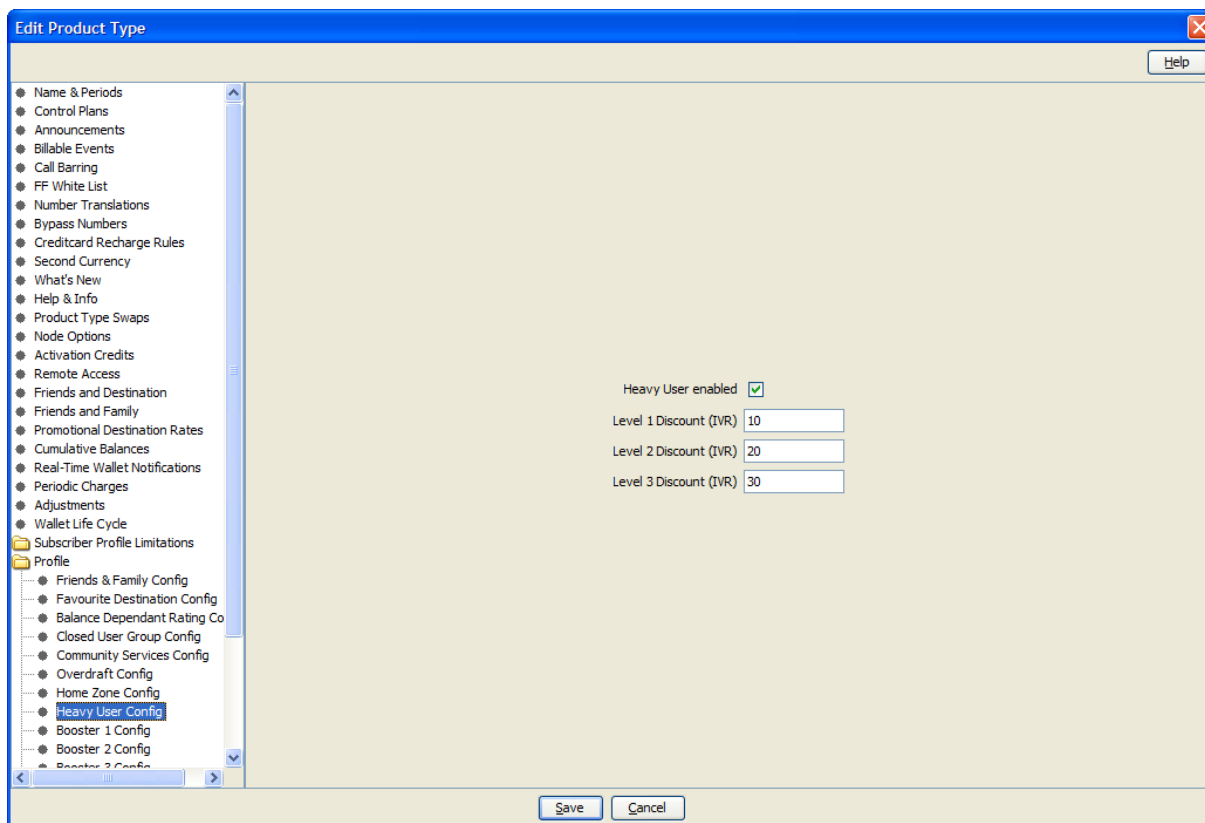
### Screens

The HU service uses one SPM custom screen:

- Product Type

## Product Type screen

Here is an example screen.



These settings are used by the IVR Self-Care service logic.

## Screens Template access

A standard NCC installation creates access rights for the custom HU screens, for the following users:

- “Operator”
- “Administrator”

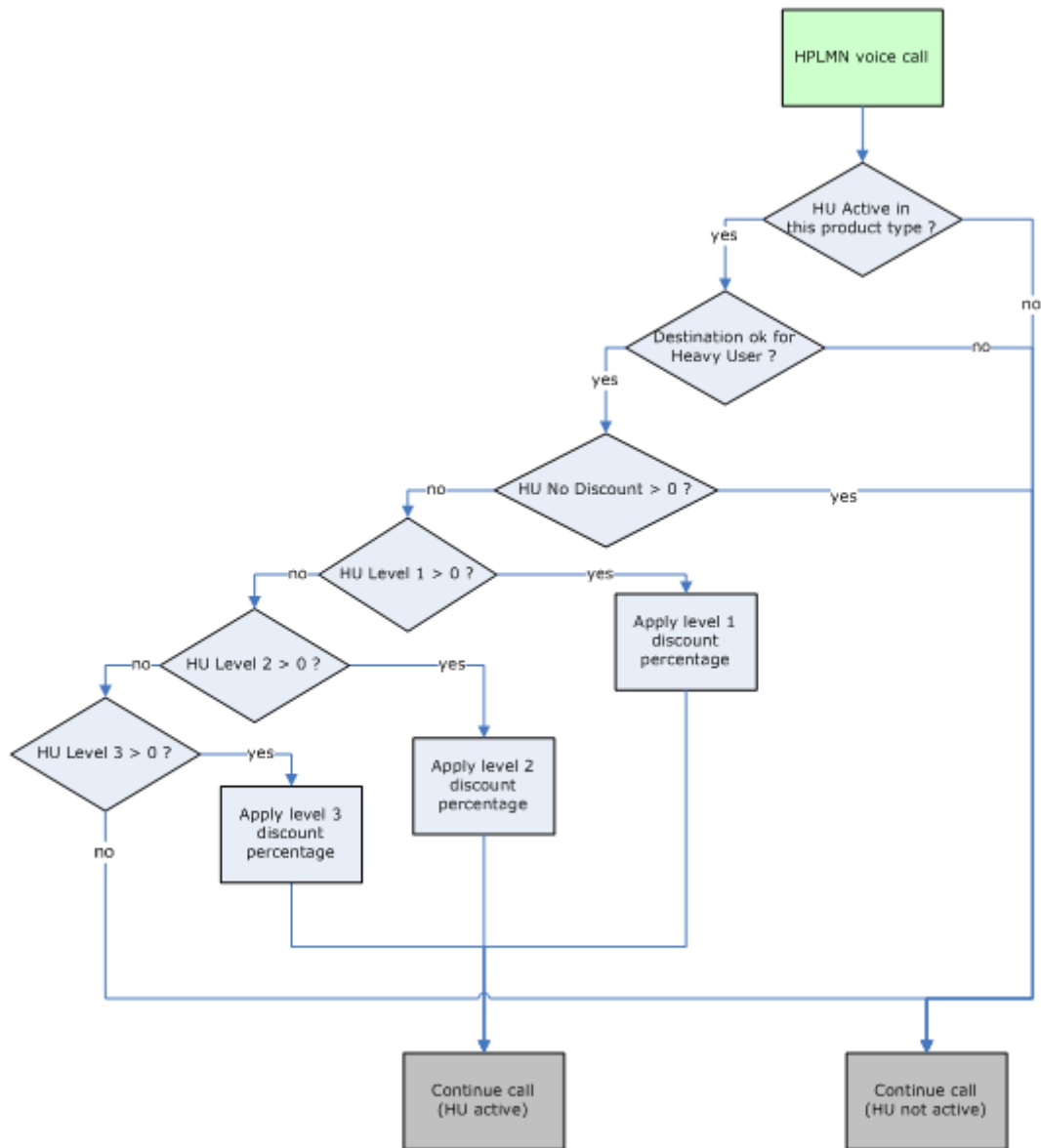
## Flow charts

The flow charts contain a number of parameter references.

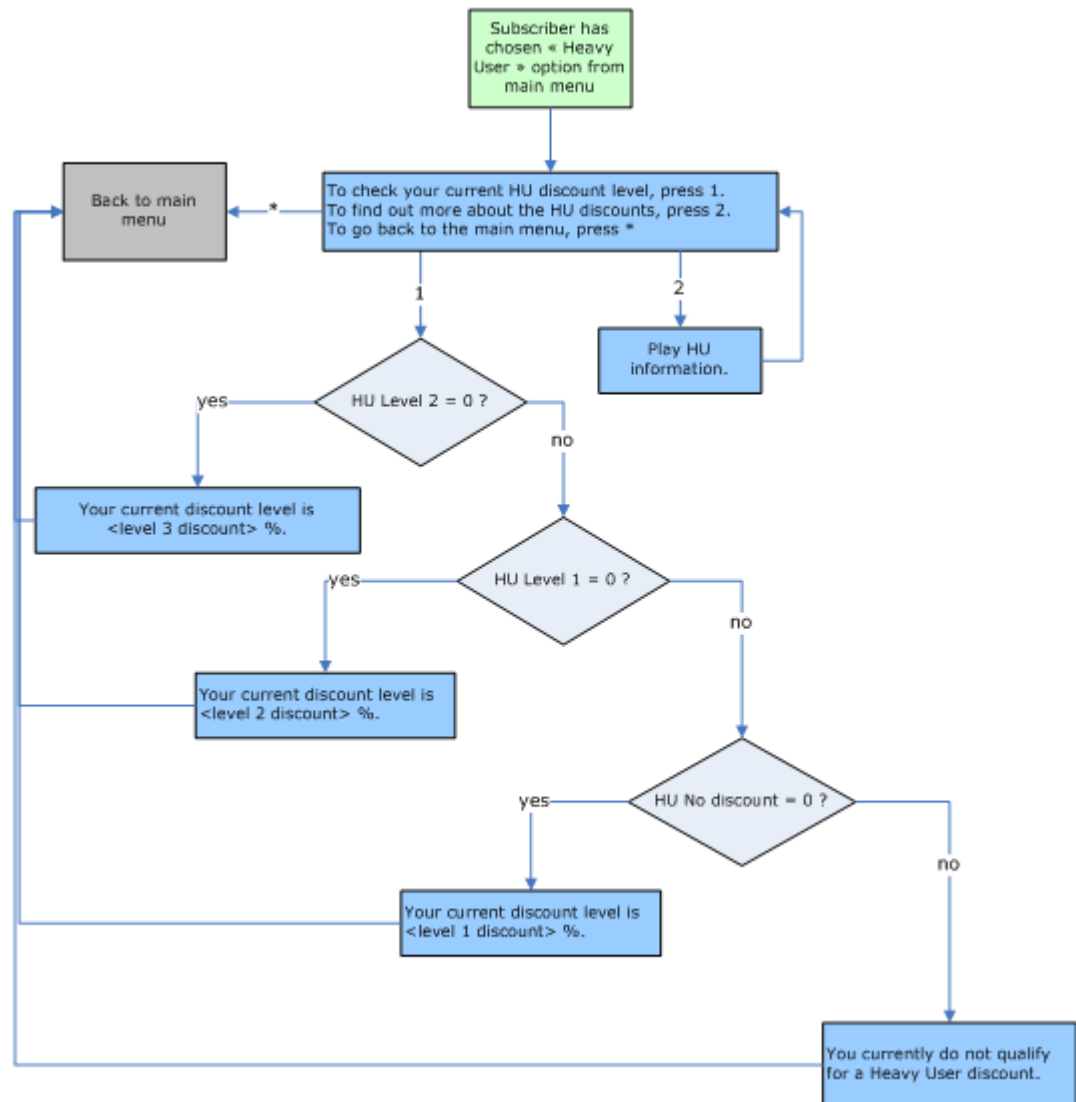
Here is a description of the meaning of each of these parameters:

- HU No Discount: this is the initial minimal expenditure threshold; no discounts are activated until this level is reached.
- HU Level 1/2/3: these are the expenditure thresholds which active the 1st/2nd/3rd discount level.

HPLMN Voice



## Check Discount



## Boosters

### Introduction

The Boosters (BO) service allows subscribers to purchase unlimited or discounted services for a defined period.

A BO purchase can be a one-time purchase (also known as “single-shot purchase”), or it can be a subscription to the BO service which implies a periodic cost.

When a subscriber makes a call or sends a message which would relate to the booster, the call is charged as per the booster agreement and not by the standard calling plan of the user.

The operator defines the included services, the validity period and the cost of the boosters up front. The end user can then subscribe to any of the pre-defined boosters.

When a subscriber makes a call or sends a message which would relate to the booster, the call is charged as per the booster agreement and not by the standard control plan of the user.

## Chapter 8

It is possible to offer a periodic subscription to a booster whereby the user is able to select to make a re-occurring payment in return for a repeated discount.

If a user has insufficient funds in his account to allow the purchase of the subscribed booster, a short Grace Period is started during which any incoming recharge is used to fund the subscription.

If the user fails to recharge in this period the subscription is automatically cancelled, allowing the user to re-subscribe once there is sufficient credit to fund the purchase.

The operator is able to define:

- Which services will be eligible for BO nomination (On-net, Off-net, National Fixed, International).
- The validity time of the Booster.
- The cost of the Booster.

The PCST provides for 5 Booster types.

A BO Self Care service is also available. For more information on the BO Self Care, see Prepaid Charging Service Template - Self Care.

### Named Events

The following named events are used by the BO service.

Field	Class	Description
Boost 1 Periodic Fee	BOOST	Periodic cost of the BO1 subscription.
Boost 2 Periodic Fee	BOOST	Periodic cost of the BO2 subscription.
Boost 3 Periodic Fee	BOOST	Periodic cost of the BO3 subscription.
Boost 4 Periodic Fee	BOOST	Periodic cost of the BO4 subscription.
Boost 5 Periodic Fee	BOOST	Periodic cost of the BO5 subscription.

### Example Event Set

These events are assigned to a product type specific named event catalogue, where they are overridden.



Prepaid Charging > Rating Management > Named Event Catalogue tab, select a named event catalogue and click **Edit**.

**Edit Named Event Catalogue**

Name: Gold    Include Default (Default)     Use Holiday Set: None

**Named Events**

Display Filters

Event Sets: All Sets    Include In Catalogue: Included    Max Rows: 999

Event Name:    Allowed in Catalogue: Allowed & Barred    Filter

Event Set	I	Named Event	A	Cash Cost	Time Cost (Secs)	More Info
BOOST	<input checked="" type="checkbox"/>	Boost 1 Periodic Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Boost 2 Periodic Fee	<input checked="" type="checkbox"/>	\$0.20		
	<input checked="" type="checkbox"/>	Boost 3 Periodic Fee	<input checked="" type="checkbox"/>	\$0.30		
	<input checked="" type="checkbox"/>	Boost 4 Periodic Fee	<input checked="" type="checkbox"/>	\$0.40		
	<input checked="" type="checkbox"/>	Boost 5 Periodic Fee	<input checked="" type="checkbox"/>	\$0.50		
CS	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
FD	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
FF	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.20		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
HA	<input checked="" type="checkbox"/>	HA	<input checked="" type="checkbox"/>			
Loyalty	<input checked="" type="checkbox"/>	Point	<input checked="" type="checkbox"/>	\$0.01		

View Details    Delete Overrides    Select All

**Named Event Override Configuration**

Event Name:

Override Name	Cash Cost	Time Cost (Secs)	A	General
Change Fee	\$0.10		<input checked="" type="checkbox"/>	Yes

New    Edit    Delete    Select All

Save    Save and Close    Close

## Control Plans

The following control plans (CP) are used by the BO service.

Name	Description
BOOST IVR - SCP	BO self-care logic. This CP is called by the overall IVR Self Care CP.
BOOST Activation - BPL	BO service activation logic (used by BPL)
BOOST Deactivation - BPL	BO service deactivation (used by BPL)
BOOST Subscription - BPL	BO service subscription (used by BPL)
HPLMN-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains BO voice service logic) This CP is called by the Voice CP (HPLMN-MO)
HPLMN-MO	HPLMN-MO control plan, which calls the “HPLMN-MO VAS Service Logic – SCP” CP.

Name	Description
SMS-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains BO SMS service logic) This CP is called by the SMS CP (SMS-MO)
SMS-MO	SMS-MO control plan, which calls the “SMS-MO VAS Service Logic – SCP” CP.
IVR Self Care	Overall IVR self care control plan, which calls VAS specific self care CPs

## Profile Fields

The following profile fields are used by the BO service.

Name	Type	Tag	Profile Block	Usage
BOOST Active	BOOLEAN	2820001	App Specific 1	Defines whether a BO single-shot is active.
BOOST Booster	NSTRING	2820002	App Specific 1	Defines which BO is set for the subscriber.
BOOST Expiry Date	DATE	2820004	App Specific 1	Defines when BO will expire.
BOOST Service Active	BOOLEAN	2820005	Global Profile	Defines whether a BO service is active (globally).
BOOST Temp Booster	NSTRING	2820015	Temporary Storage	Used during service logic processing.
BOOST 1 Validity	INTEGER	2820016	App Specific 2	Defines BO1 validity time.
BOOST 2 Validity	INTEGER	2820017	App Specific 2	Defines BO2 validity time.
BOOST 3 Validity	INTEGER	2820018	App Specific 2	Defines BO3 validity time.
BOOST 4 Validity	INTEGER	2820019	App Specific 2	Defines BO4 validity time.
BOOST 5 Validity	INTEGER	2820020	App Specific 2	Defines BO5 validity time.
BOOST Temp SorP	BOOLEAN	2820021	Temporary Storage	Used during service logic processing.
BOOST 1 Onnet (Voice)	BOOLEAN	2820022	App Specific 2	Defines if BO1 is available for on-net calls.
BOOST 1 Offnet (Voice)	BOOLEAN	2820023	App Specific 2	Defines if BO1 is available for off-net calls.
BOOST 1 Fixed (Voice)	BOOLEAN	2820024	App Specific 2	Defines if BO1 is available for National Fixed calls.
BOOST 1 International (Voice)	BOOLEAN	2820025	App Specific 2	Defines if BO1 is available for International calls.
BOOST 2 Onnet (Voice)	BOOLEAN	2820026	App Specific 2	Defines if BO2 is available for on-net calls.
BOOST 2 Offnet (Voice)	BOOLEAN	2820027	App Specific 2	Defines if BO2 is available for off-net calls.
BOOST 2 Fixed (Voice)	BOOLEAN	2820028	App Specific 2	Defines if BO2 is available for National Fixed calls.
BOOST 2 International (Voice)	BOOLEAN	2820029	App Specific 2	Defines if BO2 is available for International calls.

Name	Type	Tag	Profile Block	Usage
BOOST 3 Onnet (Voice)	BOOLEAN	2820030	App Specific 2	Defines if BO3 is available for on-net calls.
BOOST 3 Offnet (Voice)	BOOLEAN	2820031	App Specific 2	Defines if BO3 is available for off-net calls.
BOOST 3 Fixed (Voice)	BOOLEAN	2820032	App Specific 2	Defines if BO3 is available for National Fixed calls.
BOOST 3 International (Voice)	BOOLEAN	2820033	App Specific 2	Defines if BO3 is available for International calls.
BOOST 4 Onnet (Voice)	BOOLEAN	2820034	App Specific 2	Defines if BO4 is available for on-net calls.
BOOST 4 Offnet (Voice)	BOOLEAN	2820035	App Specific 2	Defines if BO4 is available for off-net calls.
BOOST 4 Fixed (Voice)	BOOLEAN	2820036	App Specific 2	Defines if BO4 is available for National Fixed calls.
BOOST 4 International (Voice)	BOOLEAN	2820037	App Specific 2	Defines if BO4 is available for International calls.
BOOST 5 Onnet (Voice)	BOOLEAN	2820038	App Specific 2	Defines if BO5 is available for on-net calls.
BOOST 5 Offnet (Voice)	BOOLEAN	2820039	App Specific 2	Defines if BO5 is available for off-net calls.
BOOST 5 Fixed (Voice)	BOOLEAN	2820040	App Specific 2	Defines if BO5 is available for National Fixed calls.
BOOST 5 International (Voice)	BOOLEAN	2820041	App Specific 2	Defines if BO5 is available for International calls.
BOOST 1 Voice Discount	DISCOUNT	2820042	App Specific 2	Discount percentage for BO1 Voice calls.
BOOST 1 SMS Discount	DISCOUNT	2820043	App Specific 2	Discount percentage for BO1 SMSs.
BOOST 2 Voice Discount	DISCOUNT	2820044	App Specific 2	Discount percentage for BO2 Voice calls.
BOOST 2 SMS Discount	DISCOUNT	2820045	App Specific 2	Discount percentage for BO2 SMSs.
BOOST 3 Voice Discount	DISCOUNT	2820046	App Specific 2	Discount percentage for BO3 Voice calls.
BOOST 3 SMS Discount	DISCOUNT	2820047	App Specific 2	Discount percentage for BO3 SMSs.
BOOST 4 Voice Discount	DISCOUNT	2820048	App Specific 2	Discount percentage for BO4 Voice calls.
BOOST 4 SMS Discount	DISCOUNT	2820049	App Specific 2	Discount percentage for BO4 SMSs.
BOOST 5 Voice Discount	DISCOUNT	2820050	App Specific 2	Discount percentage for BO5 Voice calls.
BOOST 5 SMS Discount	DISCOUNT	2820051	App Specific 2	Discount percentage for BO5 SMSs.

Name	Type	Tag	Profile Block	Usage
BOOST 1 Onnet (SMS)	BOOLEAN	2820052	App Specific 2	Defines if BO1 is available for on-net SMSs.
BOOST 1 Offnet (SMS)	BOOLEAN	2820053	App Specific 2	Defines if BO1 is available for off-net SMSs.
BOOST 1 Fixed (SMS)	BOOLEAN	2820054	App Specific 2	Defines if BO1 is available for National Fixed SMSs.
BOOST 1 International (SMS)	BOOLEAN	2820055	App Specific 2	Defines if BO1 is available for International SMSs.
BOOST 2 Onnet (SMS)	BOOLEAN	2820056	App Specific 2	Defines if BO2 is available for on-net SMSs.
BOOST 2 Offnet (SMS)	BOOLEAN	2820057	App Specific 2	Defines if BO2 is available for off-net SMSs.
BOOST 2 Fixed (SMS)	BOOLEAN	2820058	App Specific 2	Defines if BO2 is available for National Fixed SMSs.
BOOST 2 International (SMS)	BOOLEAN	2820059	App Specific 2	Defines if BO2 is available for International SMSs.
BOOST 3 Onnet (SMS)	BOOLEAN	2820060	App Specific 2	Defines if BO3 is available for on-net SMSs.
BOOST 3 Offnet (SMS)	BOOLEAN	2820061	App Specific 2	Defines if BO3 is available for off-net SMSs.
BOOST 3 Fixed (SMS)	BOOLEAN	2820062	App Specific 2	Defines if BO3 is available for National Fixed SMSs.
BOOST 3 International (SMS)	BOOLEAN	2820063	App Specific 2	Defines if BO3 is available for International SMSs.
BOOST 4 Onnet (SMS)	BOOLEAN	2820064	App Specific 2	Defines if BO4 is available for on-net SMSs.
BOOST 4 Offnet (SMS)	BOOLEAN	2820065	App Specific 2	Defines if BO4 is available for off-net SMSs.
BOOST 4 Fixed (SMS)	BOOLEAN	2820066	App Specific 2	Defines if BO4 is available for national fixed SMSs.
BOOST 4 International (SMS)	BOOLEAN	2820067	App Specific 2	Defines if BO4 is available for international SMSs.
BOOST 5 Onnet (SMS)	BOOLEAN	2820068	App Specific 2	Defines if BO5 is available for on-net SMSs.
BOOST 5 Offnet (SMS)	BOOLEAN	2820069	App Specific 2	Defines if BO5 is available for off-net SMSs.
BOOST 5 Fixed (SMS)	BOOLEAN	2820070	App Specific 2	Defines if BO5 is available for national fixed SMSs.
BOOST 5 International (SMS)	BOOLEAN	2820071	App Specific 2	Defines if BO5 is available for International SMSs.

## Notifications

The following notifications are used by the BO service.

Field	Notification text
BOOST Disabled	Your Booster service has been disabled.
BOOST Extended	Your Booster service has been extended.
BOOST Grace	Your Booster grace period has started.

**Note:** Only the English text is present in the table above. Other languages will also be present on a standard NCC installation.

These notifications are used as periodic charge notifications.

## Business Process Logic

The following BPLs are used by the BO service.

Field	Description
BOOSTSUBS	Subscribe to the BO service.
BOOSTACT	Activate a Booster.
BOOSTDACT	Deactivate a Booster (this BPL will deactivate both a single-shot or subscription BO).

## Periodic Charges

The following periodic charges (PC) are used by the BO service.

Name	Usage
Boost 1 Bronze	This PC determines whether the user has subscribed to the BO1 service and credits the BO1 Periodic Fee. This is for Bronze subscribers.
Boost 1 Silver	This PC determines whether the user has subscribed to the BO1 service and credits the BO1 periodic fee. This is for Silver subscribers.
Boost 1 Gold	This PC determines whether the user has subscribed to the BO1 service and credits the BO1 periodic fee. This is for Gold subscribers.
Boost 2 Bronze	This PC determines whether the user has subscribed to the BO2 service and credits the BO2 periodic fee. This is for Bronze subscribers.
Boost 2 Silver	This PC determines whether the user has subscribed to the BO2 service and credits the BO2 periodic fee. This is for Silver subscribers.
Boost 2 Gold	This PC determines whether the user has subscribed to the BO2 service and credits the BO2 periodic fee. This is for Gold subscribers.

Name	Usage
Boost 3 Bronze	This PC determines whether the user has subscribed to the BO3 service and credits the BO3 periodic fee. This is for Bronze subscribers.
Boost 3 Silver	This PC determines whether the user has subscribed to the BO3 service and credits the BO3 periodic fee. This is for Silver subscribers.
Boost 3 Gold	This PC determines whether the user has subscribed to the BO3 service and credits the BO3 periodic fee. This is for Gold subscribers.
Boost 4 Bronze	This PC determines whether the user has subscribed to the BO4 service and credits the BO4 periodic fee. This is for Bronze subscribers.
Boost 4 Silver	This PC determines whether the user has subscribed to the BO4 service and credits the BO4 periodic fee. This is for Silver subscribers.
Boost 4 Gold	This PC determines whether the user has subscribed to the BO4 service and credits the BO4 periodic fee. This is for Gold subscribers.
Boost 5 Bronze	This PC determines whether the user has subscribed to the BO5 service and credits the BO5 periodic fee. This is for Bronze subscribers.
Boost 5 Silver	This PC determines whether the user has subscribed to the BO5 service and credits the BO5 periodic fee. This is for Silver subscribers.
Boost 5 Gold	This PC determines whether the user has subscribed to the BO5 service and credits the BO5 periodic fee. This is for Gold subscribers.

## Screens

The BO service uses six SPM custom screens:

- Five Product Type screens
- One Subscriber screen

## Product Type screen

There are five BO product type panels, one for each BO. They are all identical and look like this.

The screenshot shows the 'Edit Product Type' window with a tree view on the left and configuration fields on the right. The tree view includes categories like 'Bypass numbers', 'Profile', and 'Subscriber Profile Limitations'. The 'Profile' category is expanded, showing various configuration options. The right side of the window contains the following configuration fields:

- Validity (IVR):
- Onnet Voice:  Onnet SMS:
- Offnet Voice:  Offnet SMS:
- Fixed Voice:  Fixed SMS:
- International Voice:  International SMS:
- Voice Discount:
 

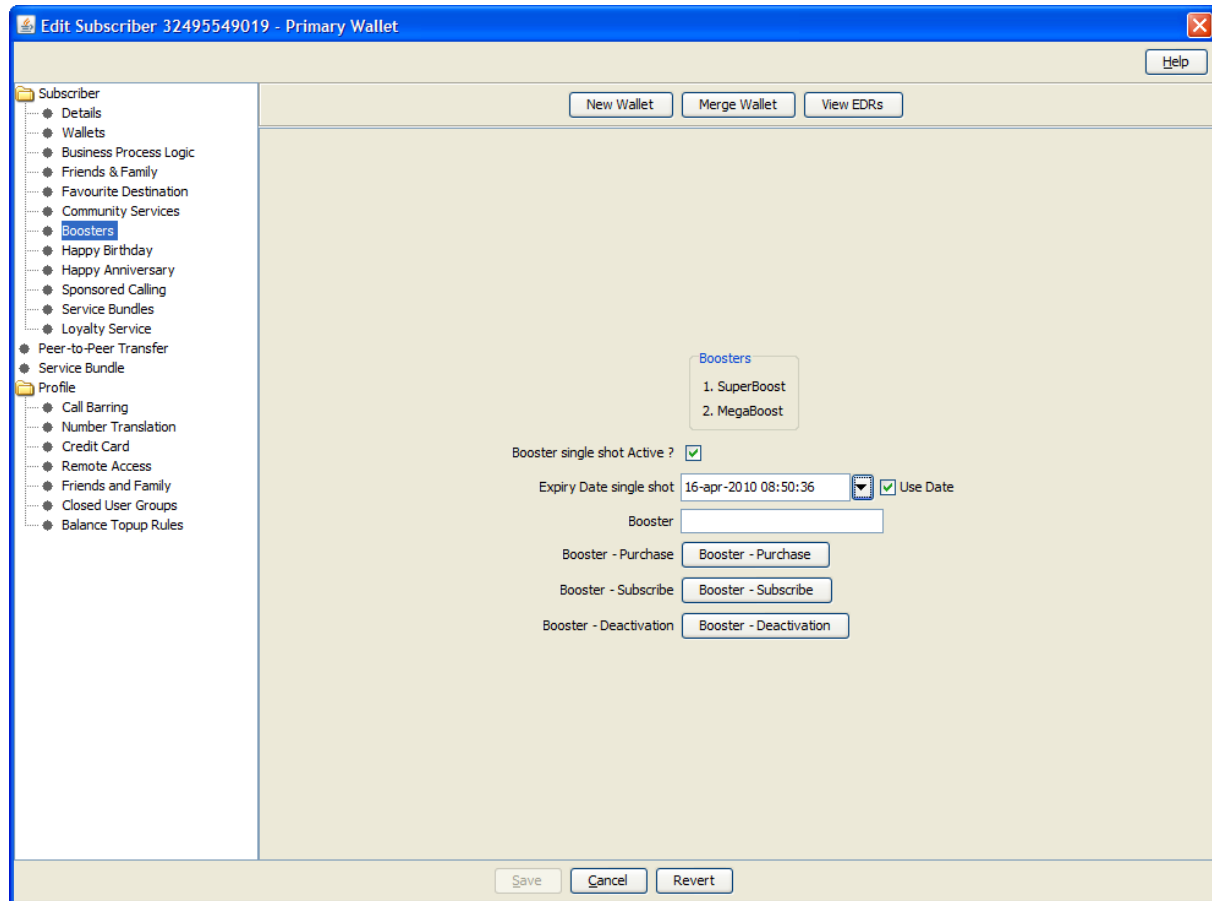
First Discount %	10
Second Discount %	20
Maximum Charge (littles)	-1
- SMS Discount:
 

First Discount %	10
Second Discount %	20
Maximum Charge (littles)	-1

At the bottom of the window, there are 'Save' and 'Cancel' buttons.

## Subscriber screen

Here is an example screen.



## Screens Template access

A standard NCC installation creates access rights for the custom BO screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

## Service logic

As with all VAS services, the Voice and SMS control plans each have a "VAS Service Logic" sub control plan, called respectively:

- "HPLMN-MO VAS Service Logic – SCP"
- "SMS-MO VAS Service Logic – SCP"

These "VAS Service Logic" control plans contain the service logic for this service, and are only used for HPLMN-MO and SMS-MO capabilities.



### Voice and SMS-MO

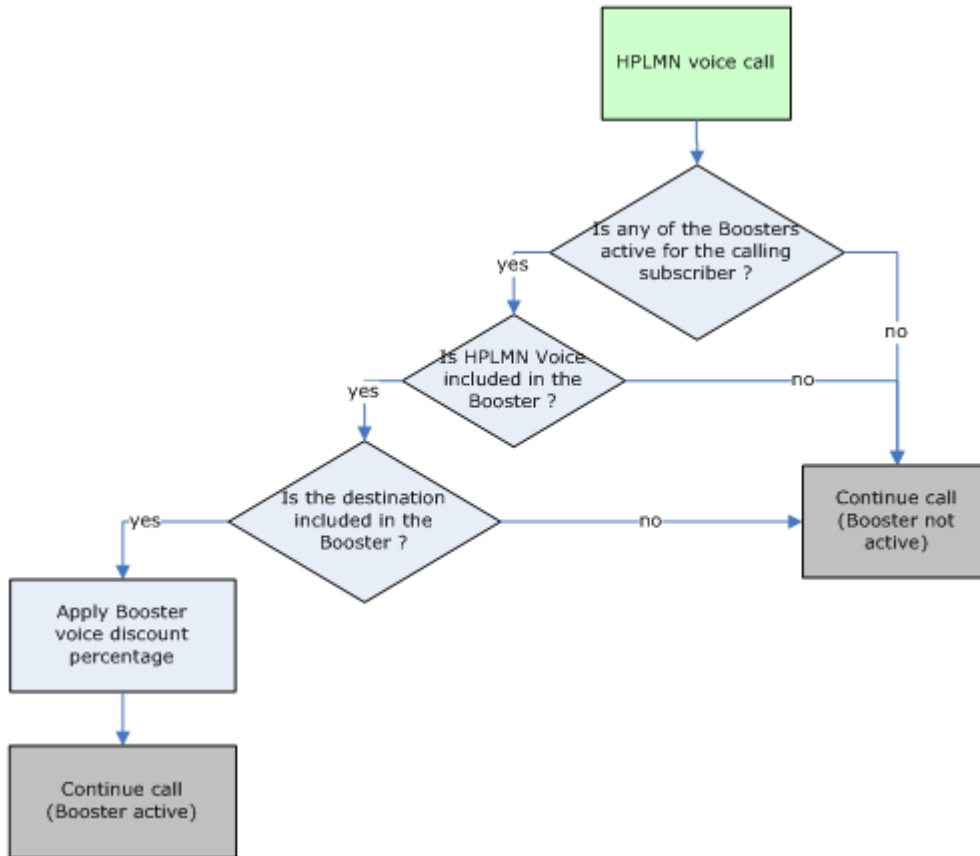
The Voice and SMS BO service logic is identical and looks like this.

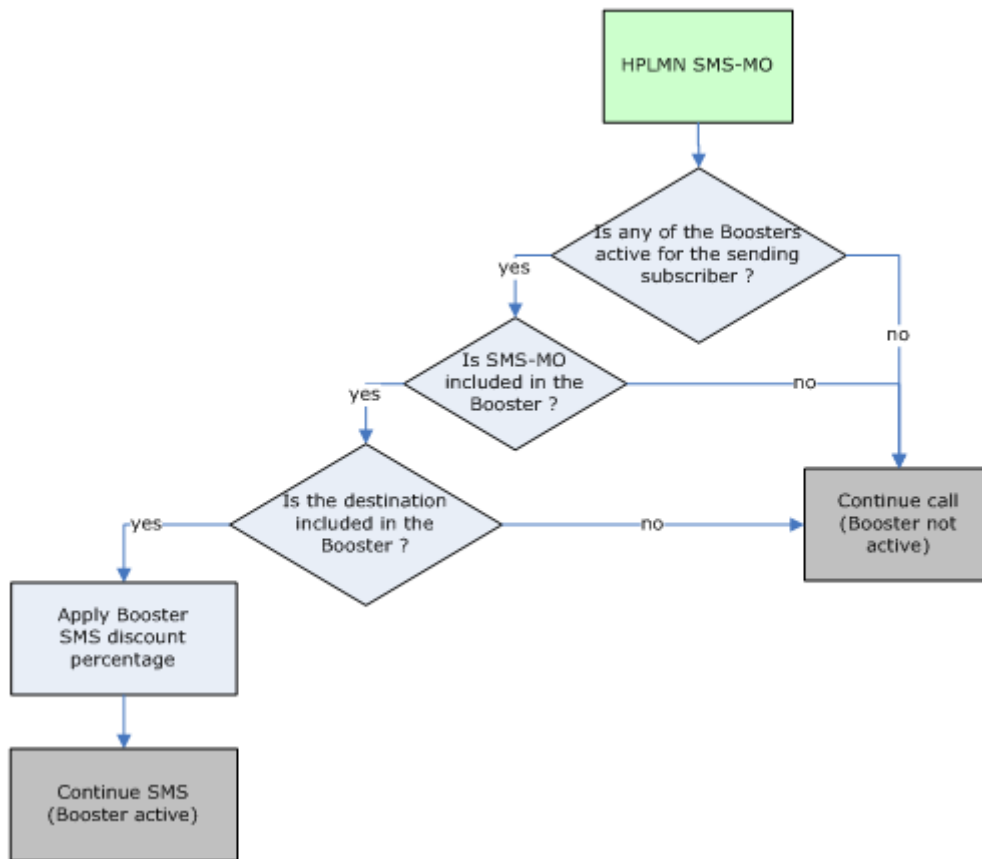


## Flow charts

The flow chart below provides more information on how the BO service functions for the different call scenarios.

### HPLMN Voice



**HPLMN SMS-MO****Self Care**

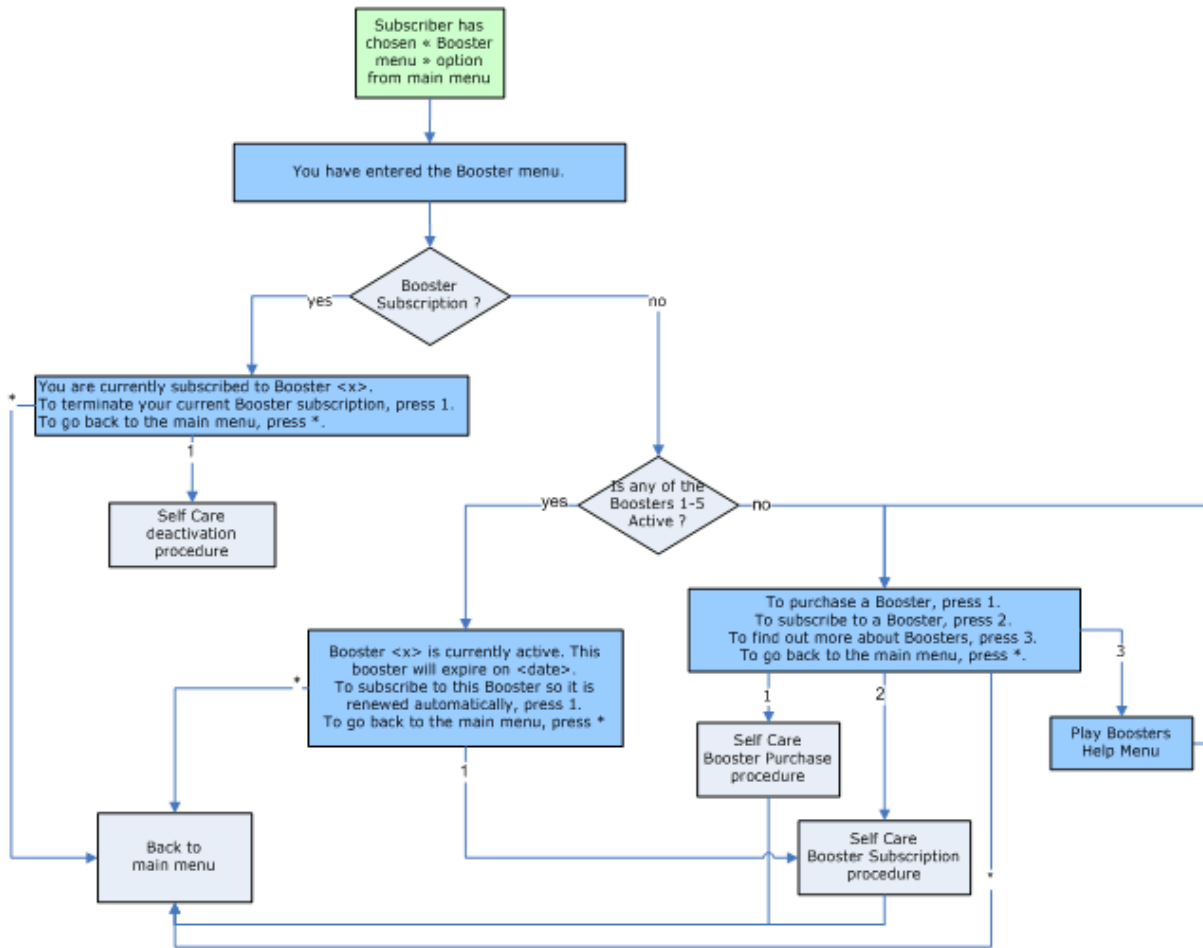
The flow charts below provide more information on how the Booster self care functions.

The flow charts contain a number of parameter references.

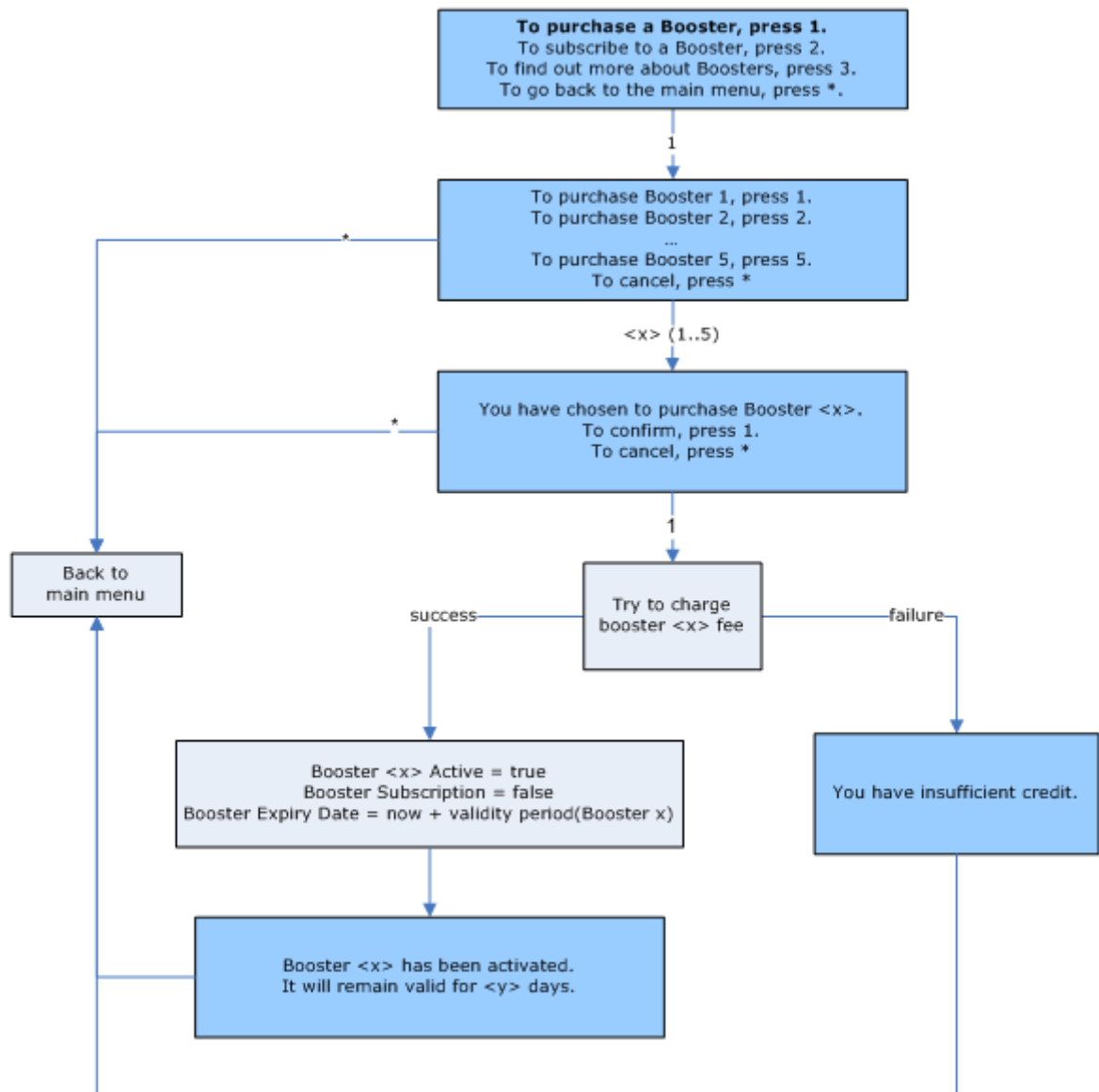
Here is a description of the meaning of each of these parameters:

- Booster <x> Active: true if Booster <x> is currently activated for the subscriber
- Booster Subscription: true if the subscriber has a recurring subscription to the Booster
- Booster Expiry Date: end date of the validity period of the Booster for this subscriber
- Booster Grace: indicates whether the subscriber is in the Grace period

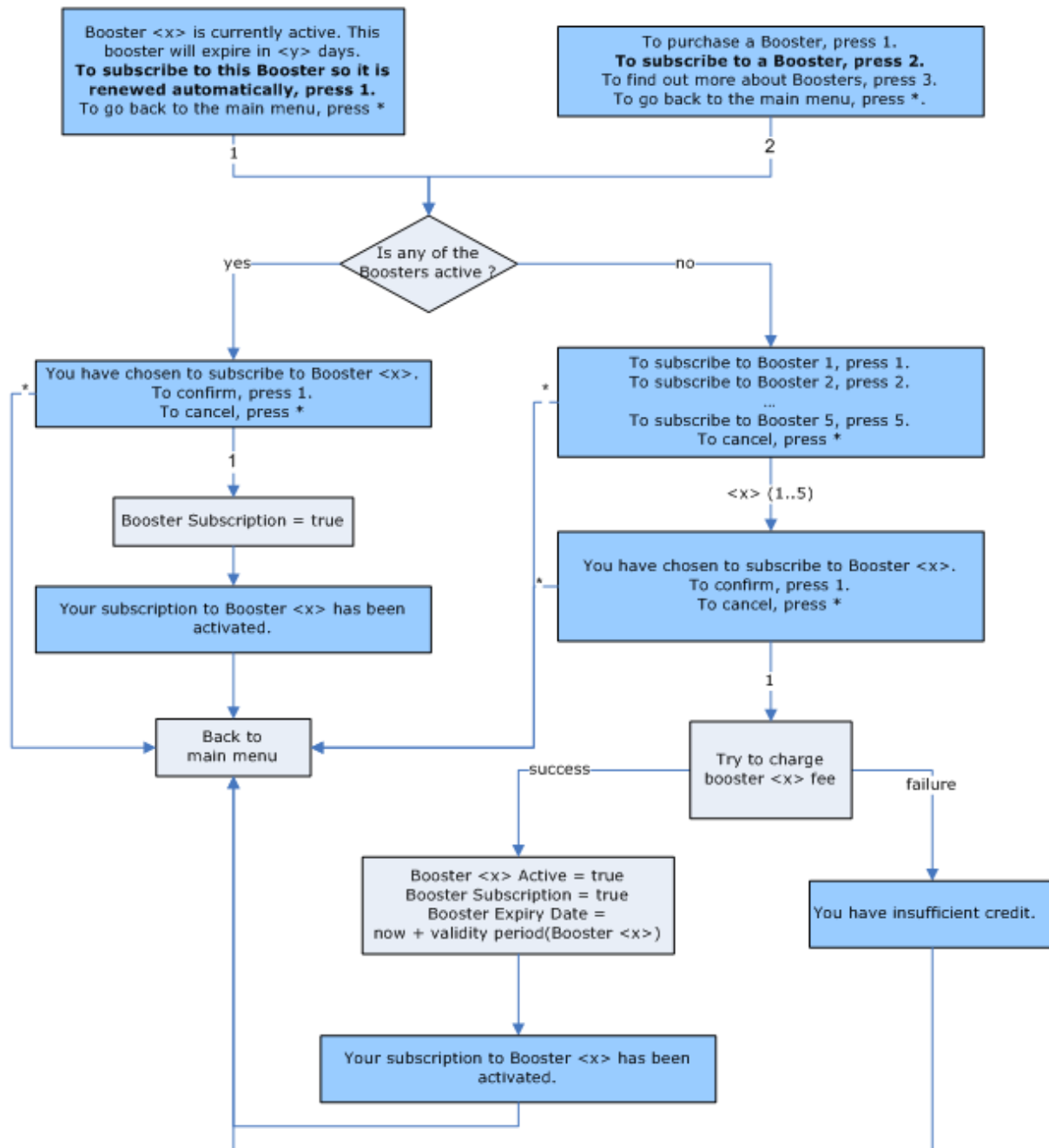
- **Booster Notice:** indicates whether the subscriber is in the Notice period



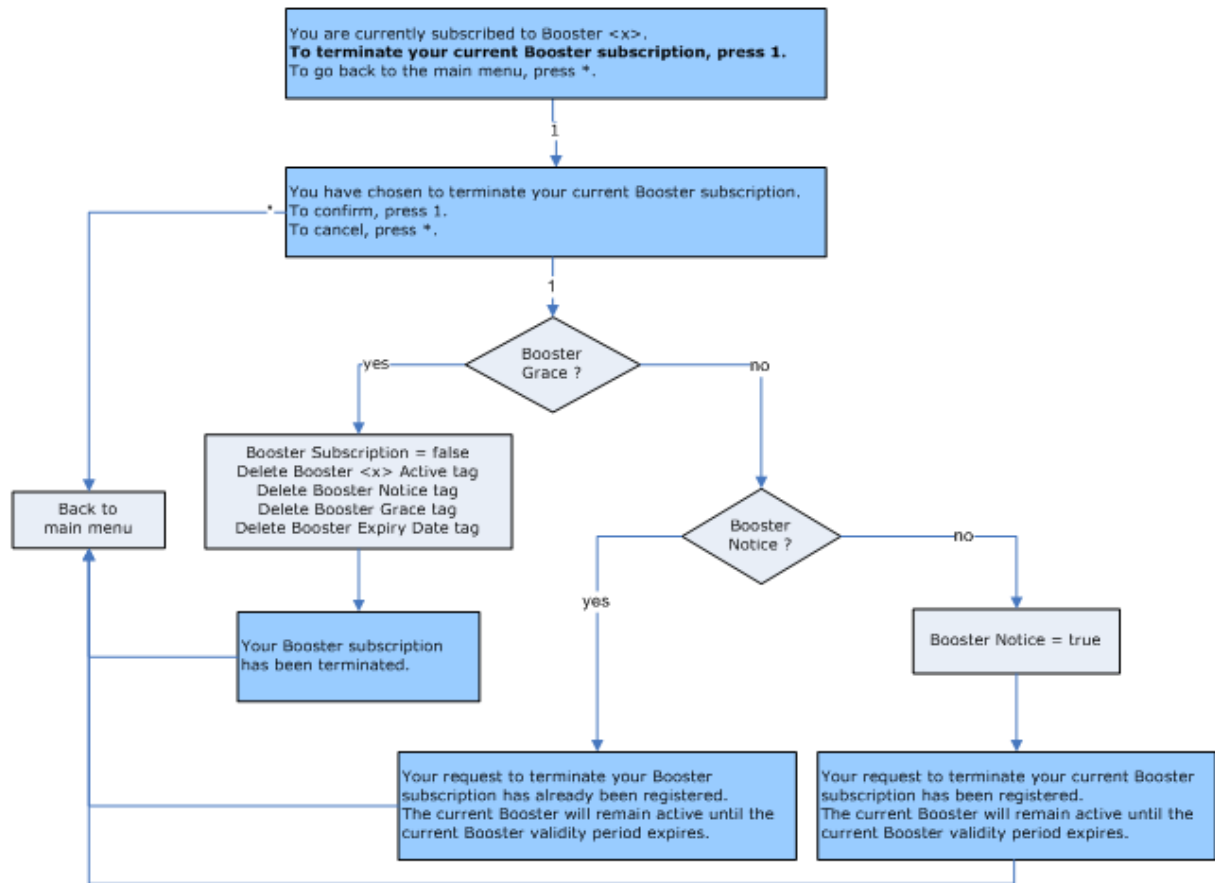
## Booster purchase



**Booster subscription**



## Booster unsubscription



## Happy Birthday

### Introduction

The “Happy Birthday” service (HB) allows the operator to wish a subscriber a “Happy Birthday”, and to give the subscriber a discount on the subscriber’s birthday.

When the subscriber registers their SIM details with the network operator, date of birth is one of the pieces of information collected by the operator. When it is the birthday of the subscriber, an SMS can be sent to the customer. This could include a text wishing ‘Happy anniversary’ or other operator specific message. The details of the present would then follow, such as free on-net calls for the day.

The operator is able to define:

- Whether HB is active for Voice/SMS
- Which type of destination will be eligible for HB nomination (On-net, Off-net, National Fixed, International).
- The HB discount

## Control Plans

The following control plans (CP) are used by the HB service.

Name	Description
HB Change - BPL	HB Change service logic (used by BPL).
HB SMS - BPL	HB SMS service logic (used internally via a crontab script -> PI to send an SMS to the subscriber).
HPLMN-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains HB Voice service logic). This CP is called by the Voice CP (HPLMN-MO).
HPLMN-MO	HPLMN-MO control plan, which calls the “HPLMN-MO VAS Service Logic – SCP” CP.
SMS-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains HB SMS service logic). This CP is called by the SMS CP (SMS-MO).
SMS-MO	SMS-MO control plan, which calls the “SMS-MO VAS Service Logic – SCP” CP.

## Profile Fields

The following profile fields are used by the HB service.

Name	Type	Tag	Profile Block	Usage
HB Service Active	BOOLEAN	2821001	Global Profile	Defines whether the HB service is active (globally).
HB Onnet Allowed	BOOLEAN	2821003	App Specific 2	Defines whether on-net calls and SMSs are allowed.
HB Offnet Allowed	BOOLEAN	2821004	App Specific 2	Defines whether off-net calls and SMSs are allowed.
HB Fixed Allowed	BOOLEAN	2821005	App Specific 2	Defines whether national fixed calls and SMSs are allowed.
HB International Allowed	BOOLEAN	2821006	App Specific 2	Defines whether international calls and SMSs are allowed.
HB Month	INTEGER	2821008	App Specific 1 Global Profile	Stores the subscriber's birthday month. Stores the current month (globally), through a crontab script
HB Day	INTEGER	2821009	App Specific 1 Global Profile	Stores the subscriber's birthday day. Stores the current day (globally), through a crontab script.
HB Voice Discount	DISCOUNT	2821010	App Specific 2	Discount percentage for HB voice calls.
HB SMS Discount	DISCOUNT	2821011	App Specific 2	Discount percentage for HB SMSs.
HB Voice Active	BOOLEAN	2821012	App Specific 2	Defines whether the HB service is active for Voice calls.
HB SMS Active	BOOLEAN	2821013	App Specific 2	Defines whether the HB service is active for SMSs.



## Notifications

The following notification is used by the HB service.

Field	Notification text
Happy Birthday	Happy Birthday! As a birthday present you will receive excessive discounts today.

**Note:** Only the English text is present in the table above. Other languages will also be present on a standard NCC installation.

This notification is used in the SMS sent to the subscriber.

## Business Process Logic

The following BPLs are used by the HB service.

Field	Description
HBCHG	Change the HB month/day for the subscriber.
HBSMS	Internal BPL used to trigger the SMS that will be sent to the subscriber.

## Crontab scripts

The following crontab scripts are used by the HB service.

Field	Usage
acsSetCurrentDate	This script populates the Global Profile Fields (HB Month and HB Day), with the current Month and Day, and gets run every day, at midnight, from the acs_oper crontab. These Global Profile Fields are used by the CP service logic.
sendHBSMS	This script checks all subscribers in the DataBase, to check if it's their Birthday. If it is, the HBSMS BPL will be triggered, via the Provisioning Interface (PI), in order to send an SMS to the subscriber. This script runs every day, at 8:00 am, from the smf_oper crontab.

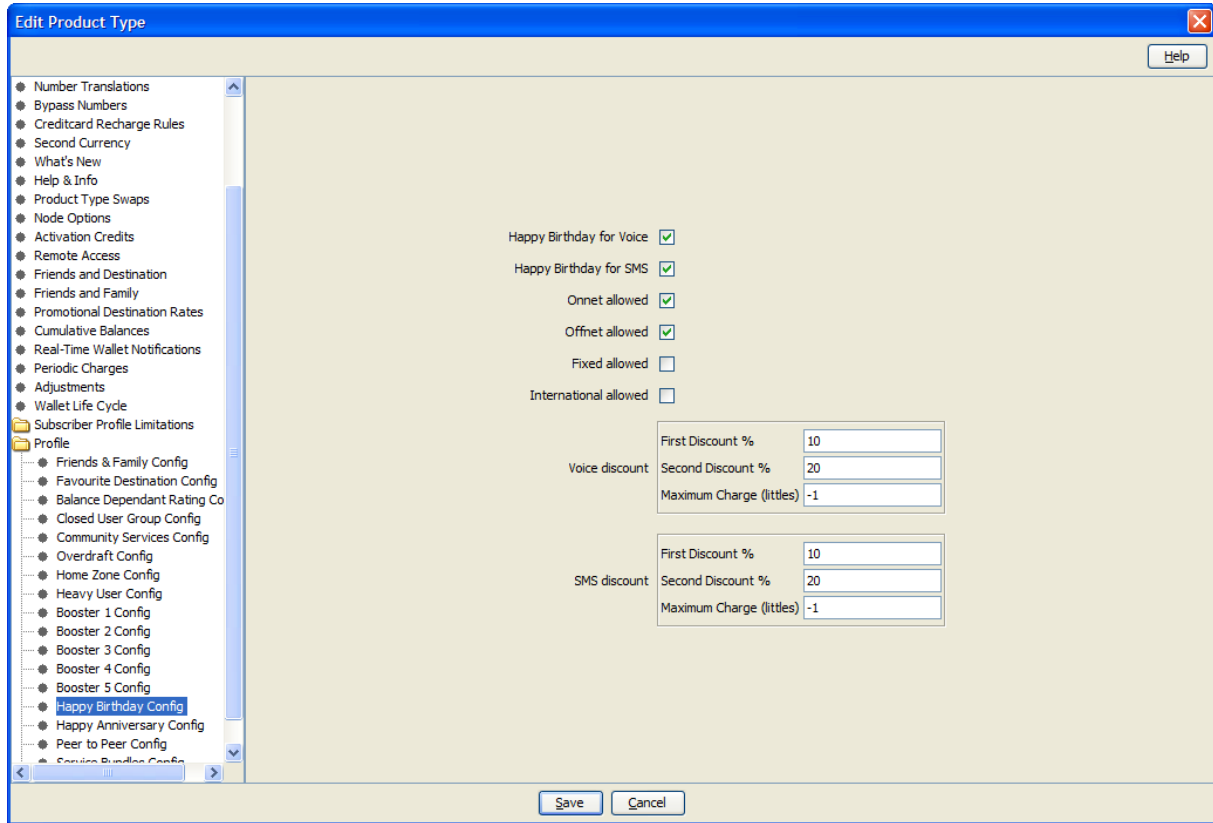
## Screens

The HB service uses two SPM custom screens:

- Product Type
- Subscriber

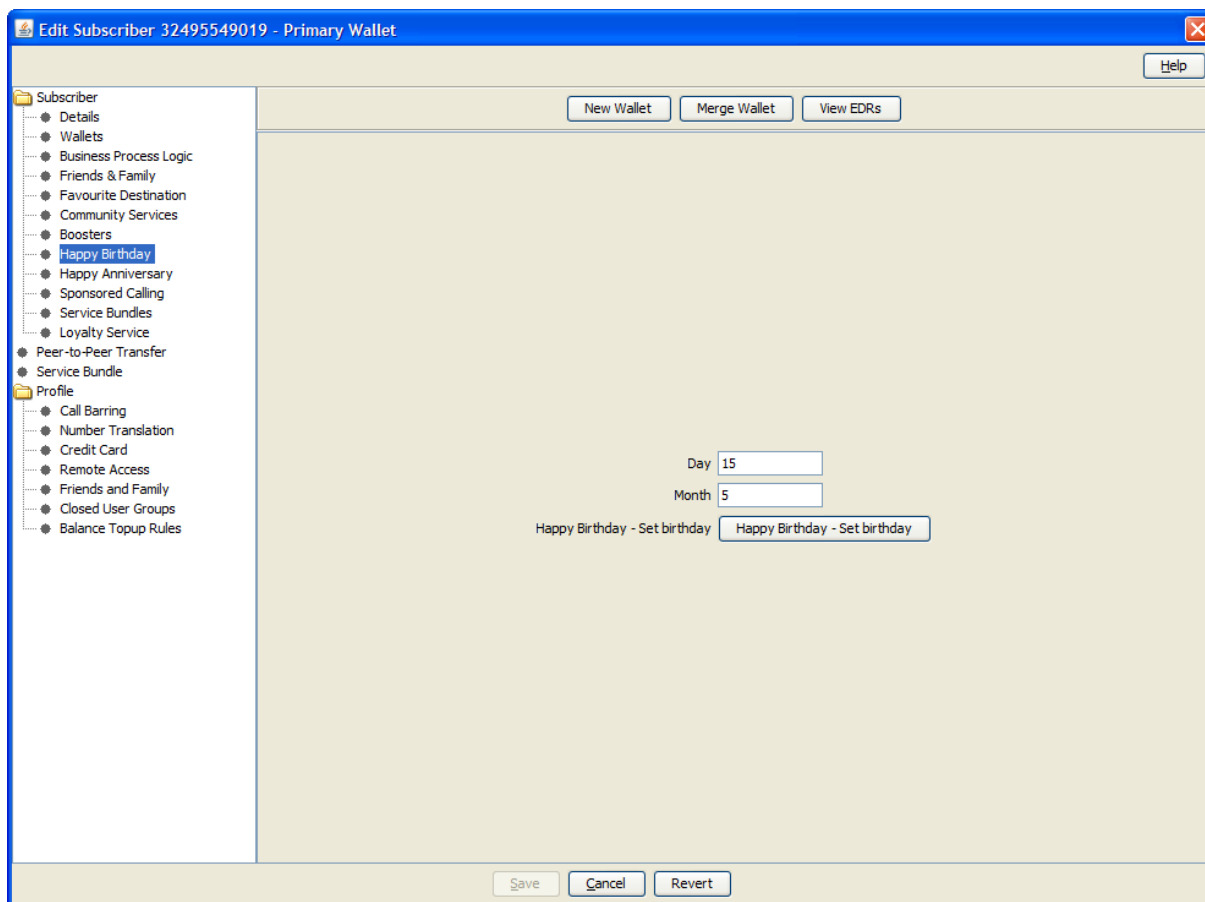
### Product Type screen

Here is an example screen.



## Subscriber screen

Here is an example screen.



## Screens Template access

A standard NCC installation creates access rights for the custom HB screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

## Service logic

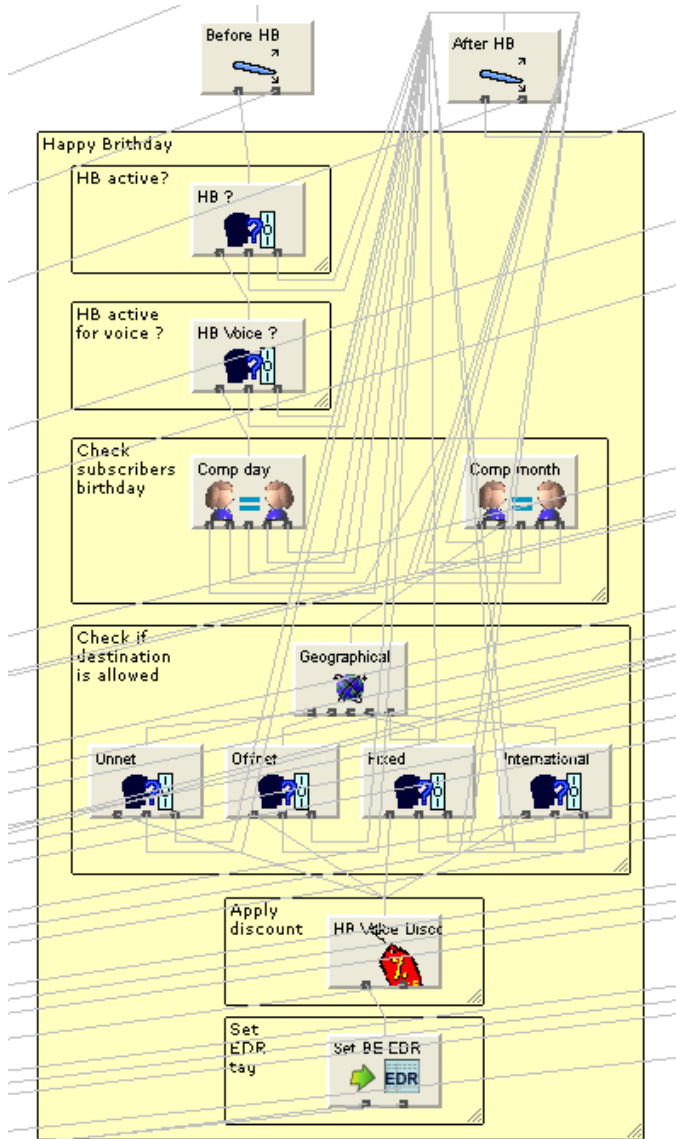
As with all VAS services, the Voice and SMS control plans each have a "VAS Service Logic" sub control plan, called respectively:

- "HPLMN-MO VAS Service Logic – SCP"
- "SMS-MO VAS Service Logic – SCP"

These "VAS Service Logic" control plans contain the service logic for this service, and are only used for HPLMN-MO and SMS-MO capabilities.

### Voice and SMS-MO

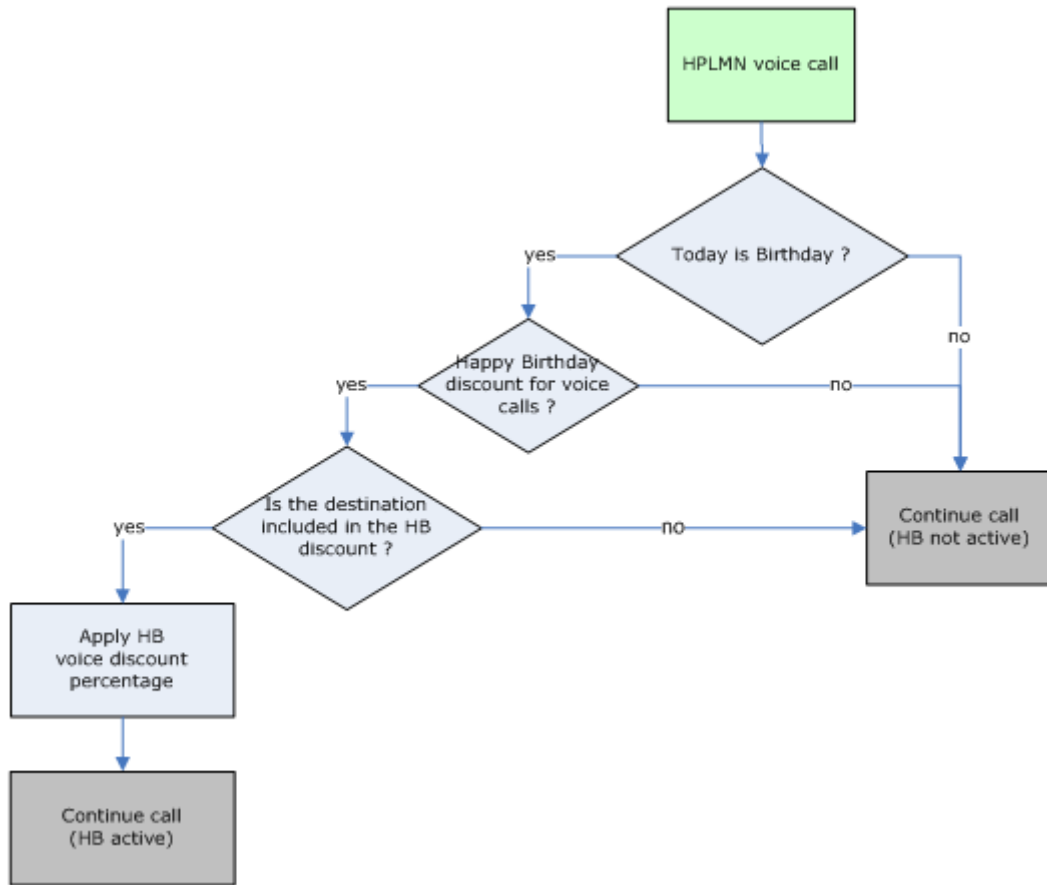
The Voice and SMS BO service logic is identical and looks like this.



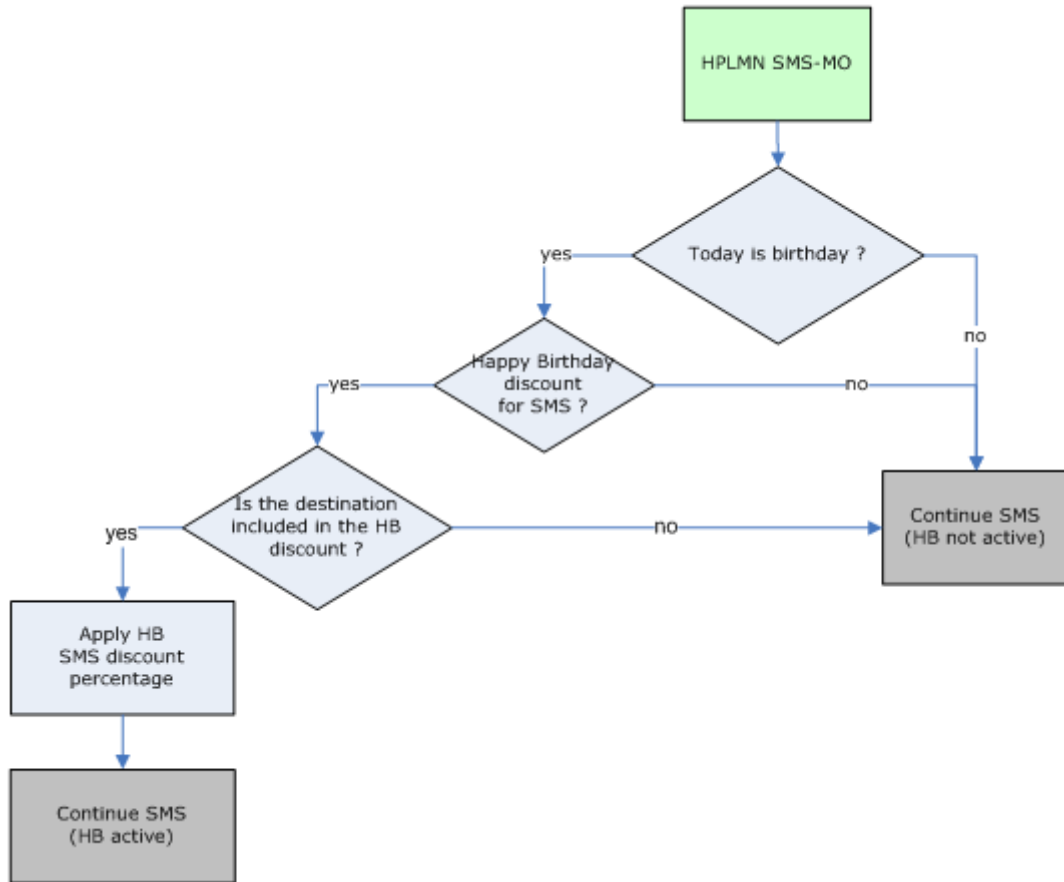
### Flow charts

The flow charts below provide more information on how the HB service functions for the different call scenarios.

## HPLMN Voice



**HPLMN SMS-MO**



## Happy Anniversary

### Introduction

The “Happy Anniversary” service (HA) allows the operator to wish a subscriber a “Happy Anniversary”, and to give the subscriber a discount on the subscriber’s anniversary.

When the subscriber makes his first call with the network operator, this date is stored in the Prepaid Charging database as the “activation date” of the subscriber. When it is the anniversary of the activation date of the subscriber, an SMS can be sent to the customer. This could include a text expressing the gratitude of the operator for the loyalty of the subscriber. The details of the present would then follow, such as free on-net calls for the day.

The operator is able to define:

- Whether HA is active for Voice/SMS
- Which type of destination will be eligible for HA nomination (On-net, Off-net, National Fixed, International).
- The HA discount

## Named Events

The following named event is used by the HA service.

Field	Class	Description
HA	HA	Used by HA periodic charge. It has a zero-cost, and is only defined because you need to specify an event for a periodic charge which only handles the notification part.

## Example Event Set

These events are assigned to a product type specific named event catalogue, where they are overridden.

**Prepaid Charging > Rating Management > Named Event Catalogue** tab, select a named event catalogue and click **Edit**.

**Edit Named Event Catalogue**

Name: Gold    Include Default (Default)     Use Holiday Set: None

**Named Events**

Display Filters

Event Sets: All Sets    Include In Catalogue: Included    Max Rows: 999

Event Name:    Allowed in Catalogue: Allowed & Barred    Filter

Event Set	I	Named Event	A	Cash Cost	Time Cost (Secs)	More Info
FF	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
	<input checked="" type="checkbox"/>	Change Fee	<input checked="" type="checkbox"/>	\$0.20		
	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
HA	<input checked="" type="checkbox"/>	HA	<input checked="" type="checkbox"/>			
Loyalty	<input checked="" type="checkbox"/>	Point	<input checked="" type="checkbox"/>	\$0.01		
Overdraft	<input checked="" type="checkbox"/>	Call	<input checked="" type="checkbox"/>	\$0.01		
Product Type	<input checked="" type="checkbox"/>	Monthly Fee	<input checked="" type="checkbox"/>	\$1.00		
P2P	<input checked="" type="checkbox"/>	P2P1 Bronze	<input checked="" type="checkbox"/>	\$10.00		
	<input checked="" type="checkbox"/>	P2P2 Bronze	<input checked="" type="checkbox"/>	\$8.00		
SB	<input checked="" type="checkbox"/>	SB1 Bronze	<input checked="" type="checkbox"/>	\$10.00		
	<input checked="" type="checkbox"/>	SB2 Bronze	<input checked="" type="checkbox"/>	\$8.00		
SMS	<input checked="" type="checkbox"/>	HPLMN Fixed	<input checked="" type="checkbox"/>	\$0.10		
	<input checked="" type="checkbox"/>	HPLMN Free	<input checked="" type="checkbox"/>			

View Details    Delete Overrides    Select All

**Named Event Override Configuration**

Event Name:

Override Name	Cash Cost	Time Cost (Secs)	A	General

New    Edit    Delete    Select All

Save    Save and Close    Close

## Control Plans

The following control plans (CP) are used by the HA service.

Name	Description
HPLMN-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains HA Voice service logic). This CP is called by the Voice CP (HPLMN-MO).

Name	Description
HPLMN-MO	HPLMN-MO control plan, which calls the “HPLMN-MO VAS Service Logic – SCP” CP.
SMS-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains HA SMS service logic). This CP is called by the SMS CP (SMS-MO)
SMS-MO	SMS-MO control plan, which calls the “SMS-MO VAS Service Logic – SCP” CP.

## Profile Fields

The following profile fields are used by the HA service.

Name	Type	Tag	Profile Block	Usage
HA Anniversary	DATE	2823000	App Specific 1	Holds the subscribers anniversary date.
HA Service Active	BOOLEAN	2823001	Global Profile	Defines whether the HA service is active (globally).
HA Onnet Allowed	BOOLEAN	2823002	App Specific 2	Defines whether on-net calls and SMSs are allowed.
HA Offnet Allowed	BOOLEAN	2823003	App Specific 2	Defines whether off-net calls and SMSs are allowed.
HA Fixed Allowed	BOOLEAN	2823004	App Specific 2	Defines whether national fixed calls and SMSs are allowed.
HA International Allowed	BOOLEAN	2823005	App Specific 2	Defines whether international calls and SMSs are allowed.
HA Voice Discount	DISCOUNT	2823006	App Specific 2	Discount percentage for HA Voice calls.
HA SMS Discount	DISCOUNT	2823007	App Specific 2	Discount percentage for HA SMSs.
HA Voice Active	BOOLEAN	2823008	App Specific 2	Defines whether the HA service is active for voice calls.
HA SMS Active	BOOLEAN	2823009	App Specific 2	Defines whether the HA service is active for SMSs.

## Notifications

The following notification is used by the HA service.

Field	Notification text
Happy Anniversary	Happy Anniversary! As an anniversary present you will receive excessive discounts today.

**Note:** Only the English text is present in the table above. Other languages will also be present on a standard NCC installation.

This notification is triggered by a successful HA periodic charge.



## Periodic Charges

The following periodic charge (PC) is used by the HA service.

Name	Usage
HA	<p>This PC determines whether the user has subscribed to the HA service and sends out the HA notification.</p> <p>This PC also has a debit operation (HA named event), but this has a zero-cost, and is only defined because it is not currently possible to define a PC which only does the notification part.</p>

This PC is assigned to all NCC product types.

## Screens

The HA service uses two SPM custom screens:

- Product Type
- Subscriber

### Product Type screen

Here is an example screen.

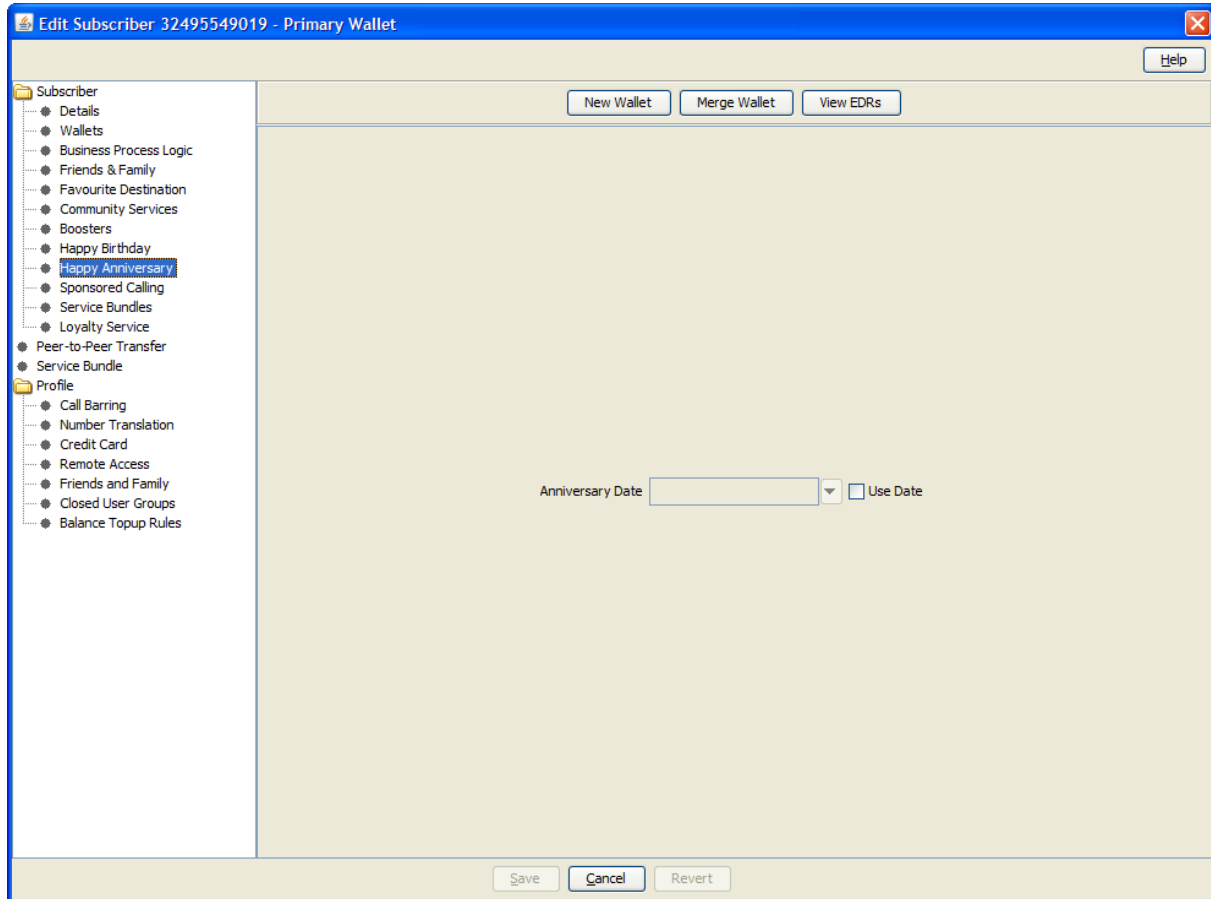
The screenshot shows the 'Edit Product Type' window. The left-hand tree view includes categories like 'Bypass Numbers', 'Creditcard Recharge Rules', 'Second Currency', 'What's New', 'Help & Info', 'Product Type Swaps', 'Node Options', 'Activation Credits', 'Remote Access', 'Friends and Destination', 'Friends and Family', 'Promotional Destination Rates', 'Cumulative Balances', 'Real-Time Wallet Notifications', 'Periodic Charges', 'Adjustments', 'Wallet Life Cycle', 'Subscriber Profile Limitations', and 'Profile'. Under 'Profile', 'Happy Anniversary Config' is selected. The main configuration area shows the following settings:

- Happy Anniversary for Voice:
- Happy Anniversary for SMS:
- Onnet allowed:
- Offnet allowed:
- Fixed allowed:
- International allowed:
- Voice discount:
  - First Discount %: 10
  - Second Discount %: 20
  - Maximum Charge (littles): -1
- SMS discount:
  - First Discount %: 10
  - Second Discount %: 20
  - Maximum Charge (littles): -1

Buttons for 'Save' and 'Cancel' are located at the bottom of the window.

## Subscriber screen

Here is an example screen.



## Screens Template access

A standard NCC installation creates access rights for the custom HA screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

## Service logic

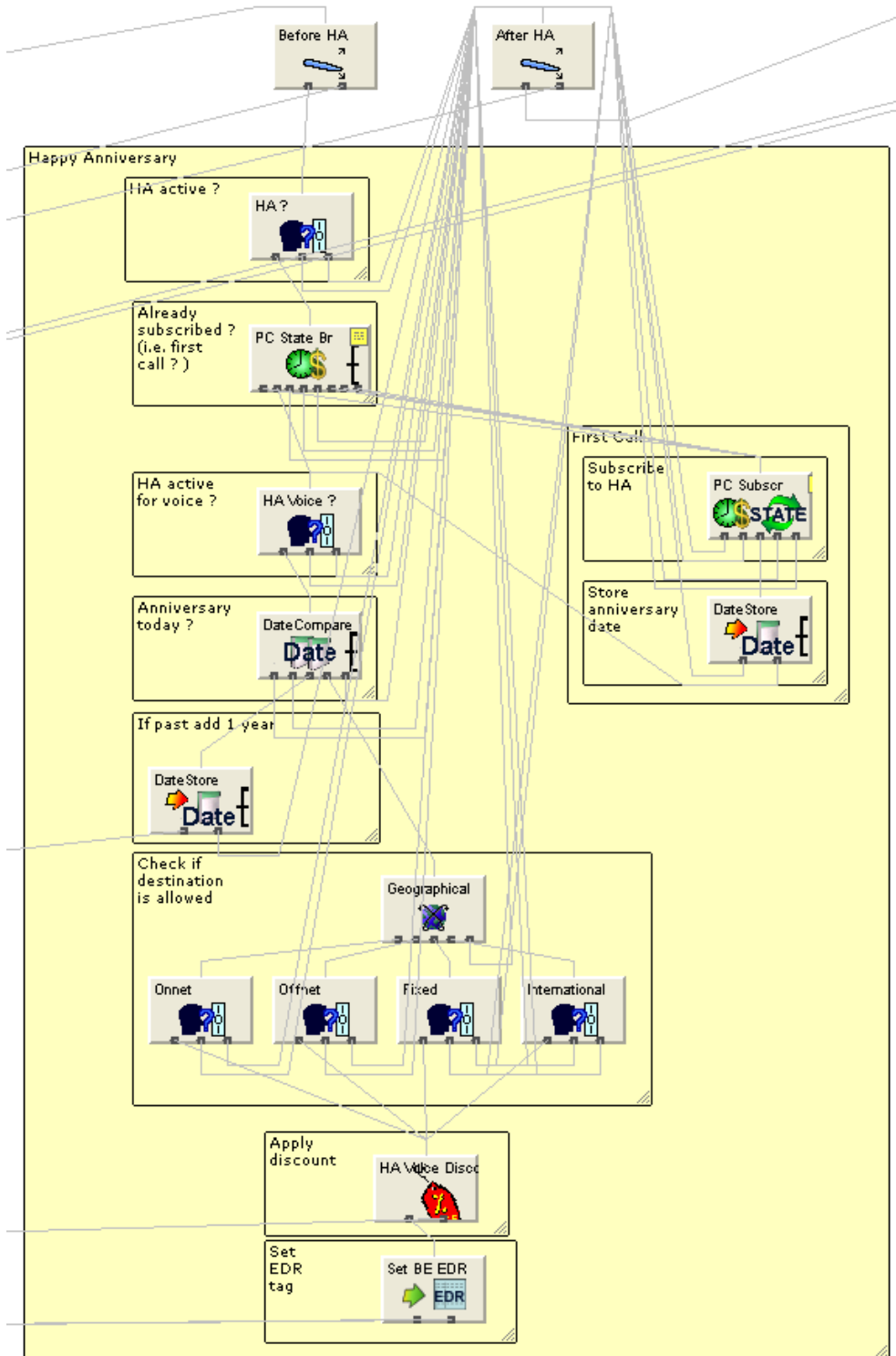
As with all VAS services, the Voice and SMS control plans each have a "VAS Service Logic" sub control plan, called respectively:

- "HPLMN-MO VAS Service Logic – SCP"
- "SMS-MO VAS Service Logic – SCP"

These "VAS Service Logic" control plans contain the service logic for this service, and are only used for HPLMN-MO and SMS-MO capabilities.

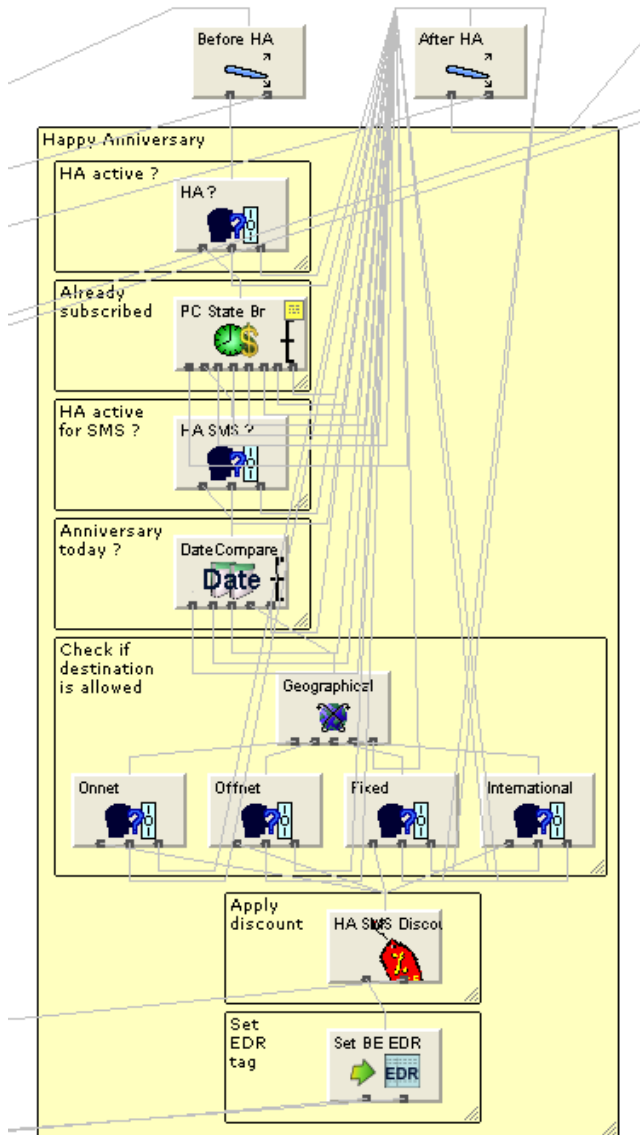
**Voice**

The Voice service logic looks like this.



### SMS

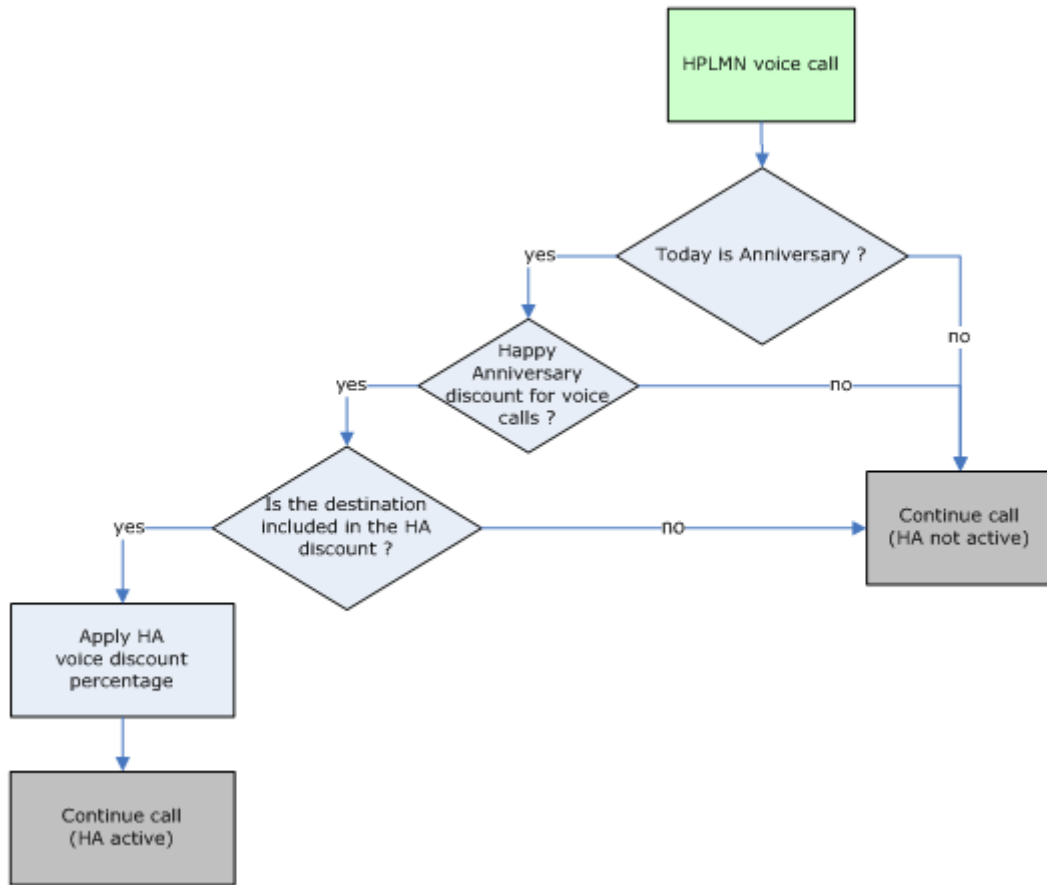
The SMS service logic looks very similar to the voice service logic, but does not have the HA subscription logic, as this is only used as a result of the first call through the system.



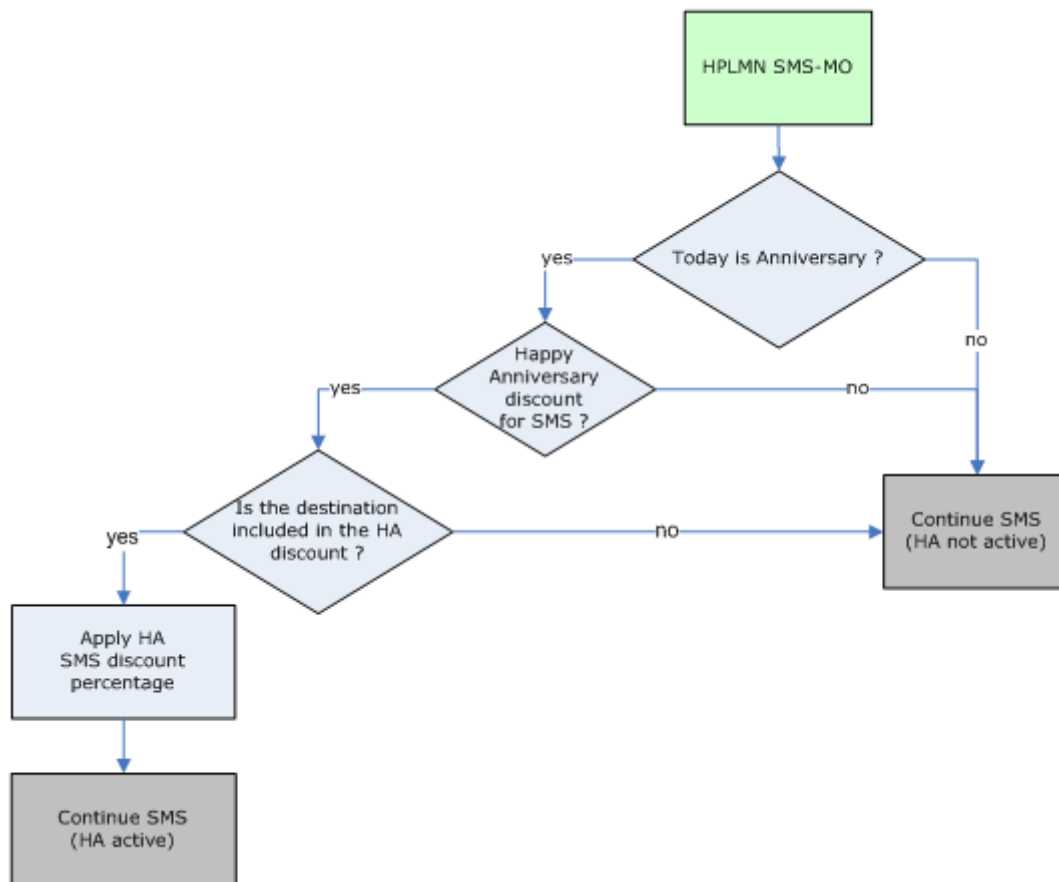
### Flow charts

The flow charts below provide more information on how the HA service functions for the different call scenarios.

## HPLMN Voice



## HPLMN SMS-MO



## Calling Card

### Introduction

The Calling Card (CC) service is an IN service which allows calls to be charged to the owner of the calling card rather than the telephone from which the call is being made. The user dials a predefined service number, enters a security code, then enters the number to which the caller would like to be transferred. The cost of this call is not deducted from the telephone which is making the call, but from the wallet associated with the calling card.

The operator must define any restrictions on calls that can be made from the calling card. For example, international calls may be restricted, but all fixed line and mobile calls will not.

Calling card is particularly appealing in markets where users may not be able to afford their own telephones but have a need for its usage. In certain countries which are developing their telecommunication infrastructure networks, it will be common for many people in an area to not own their own telephone. However, there will be a demand for many people to use a telephone. It is quite common for Public Call Offices (PCO's) to exist – a place where there is a telephone and where people can go to use the telephone. In this type of situation, the calling card situation can be ideal.

Recharge of the Calling Card wallet may be through any of the existing prepaid interfaces, such as physical vouchers.

The operator is able to define:

- Which type of destination will be eligible for CC nomination (On-net, Off-net, National Fixed, International).

A CC self-care service is also available. For more information on the CC self care, see Prepaid Charging Service Template - Self Care.

## Control Plans

The following control plans (CP) are used by the CC service.

Name	Description
Calling Card IVR - SCP	CC self-care logic. This CP is called by the overall IVR Self Care CP.
Calling Card	CC service logic.
IVR Self Care	Overall IVR self care control plan, which calls VAS specific self care CPs.

## Profile Fields

The following profile fields are used by the CC service.

Name	Type	Tag	Profile Block	Usage
CC Service Active	BOOLEAN	2825000	Global Profile	Defines whether the CC service is active (globally).
CC Onnet Allowed	BOOLEAN	2825001	Global Profile	Defines whether on-net calls are allowed.
CC Offnet Allowed	BOOLEAN	2825002	Global Profile	Defines whether off-net calls are allowed.
CC Fixed Allowed	BOOLEAN	2825003	Global Profile	Defines whether national fixed calls are allowed.
CC International Allowed	BOOLEAN	2825004	Global Profile	Defines whether International calls are allowed.
CC Invalid Counter	INTEGER	2825005	Temporary Storage	Used during service logic processing.

## Service logic

CC uses its own CCS Capability, and as such, is triggered by dialing a specific access number.

For example, **Prepaid Charging > Service Management > Capability**.

The screenshot shows a dialog box titled "Edit Capability" with a blue header bar. In the top right corner of the header is a close button (X). Below the header is a "Help" button. The main content area is light beige and contains the following fields:

- Name: Calling Card
- Service: CCS
- Called Party Number: 9999
- Default Control Plan: Calling Card (dropdown menu)
- Statistics Category: Voice (dropdown menu)
- Statistics Protocol: CAP2 (dropdown menu)
- Bearer Capability:
- CDR Type:

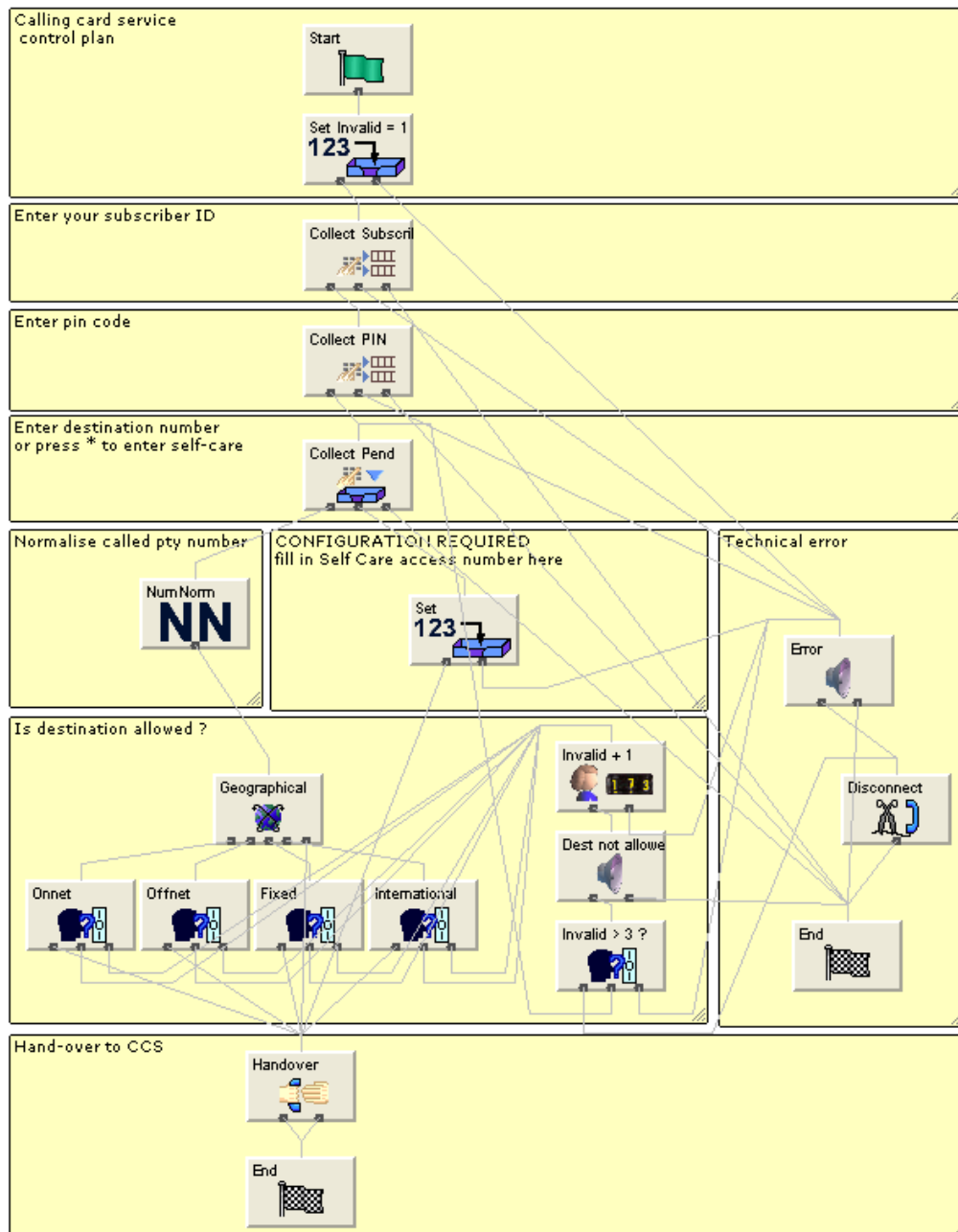
At the bottom of the dialog are two buttons: "Save" and "Cancel".

This CCS Capability specifies the control plan which will be triggered, containing the CC service logic.



## CC Service Logic

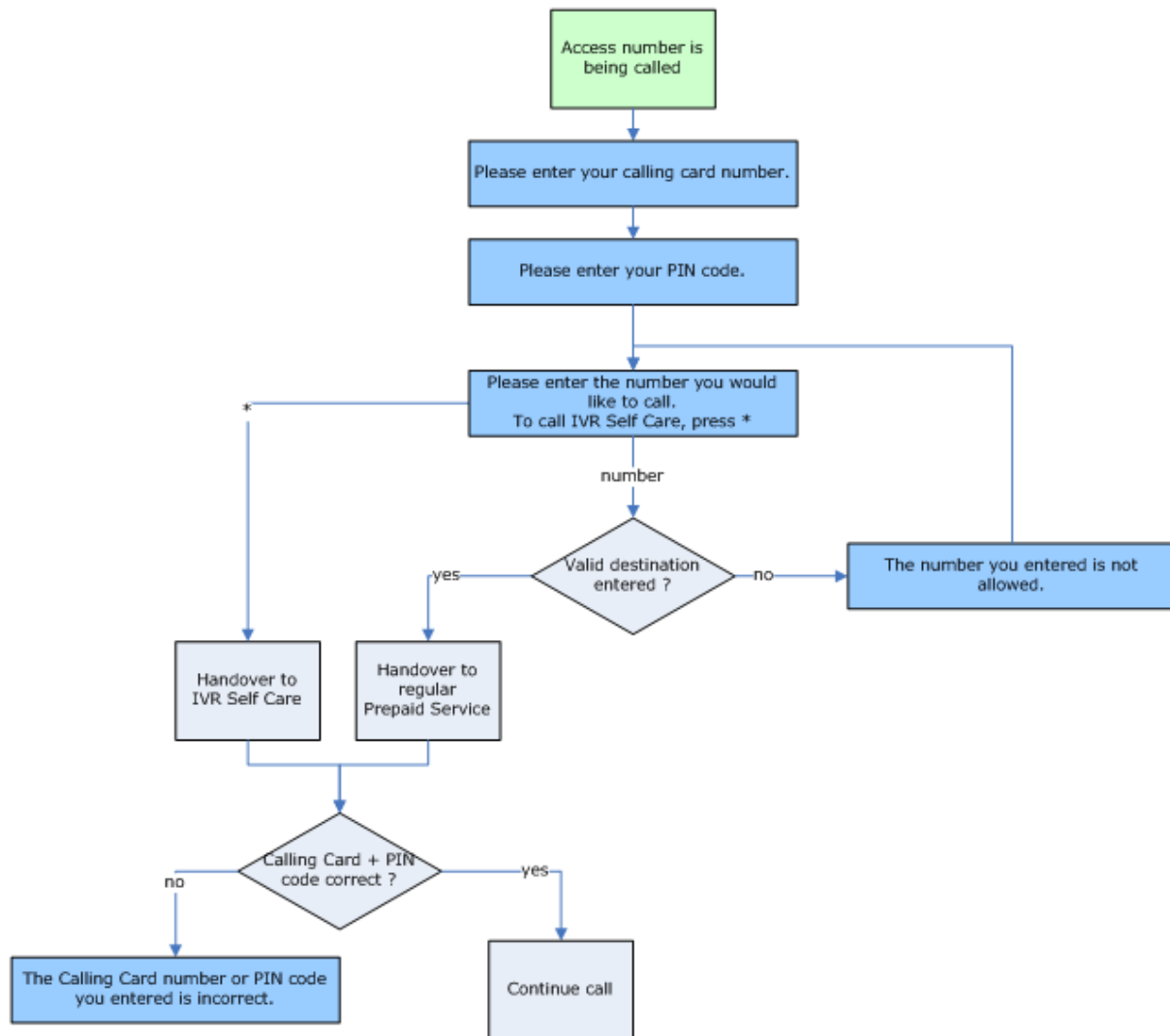
The CC service logic looks like this.



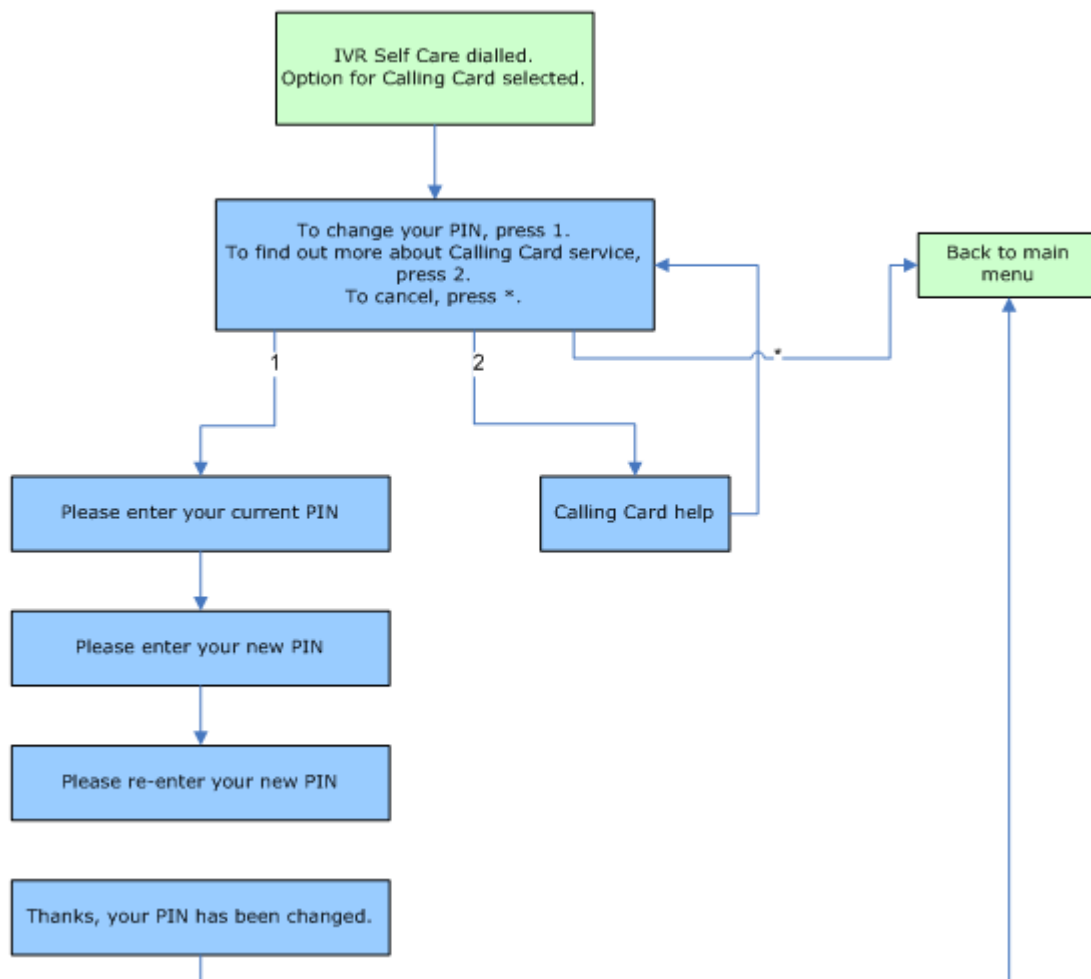
## Flow charts

The flow charts below provide more information on how the CC service functions for the different call scenarios.

Calling Card



## Self Care



## Sponsored Calling

### Introduction

The “Sponsored calling” service (SC) is a service whereby an agreement is made between a sponsor and a recipient account. The recipient can make calls to the sponsor from their own phone and have the cost of the call deducted from the sponsor wallet. Therefore, the user is not charged for the cost of any call to a predefined number.

The cost of any sponsored calls is in line with a special ‘sponsored call’ tariff for those associated calls. For example, a sponsored call tariff is created, whereby any call that is sponsored will be charged at 30c per minute.

A sponsoring account can nominate as many users as he would like for them to be able to make sponsored calls – please note that only the sponsor may set up this relationship.

Sponsored calling is particularly useful for the relationship between parents and their children. Using sponsored calling, a child will always be able to call home (a sponsored number) regardless of whether they have any credit for their own personal calls. This is because the cost of the call will be deducted from the wallet of the parent (sponsor account).

Sponsored calls can always be made by a user even if they are out of credit. The only situation where the call will not be allowed will be if the sponsoring account itself is out of credit.

## Tariff Plan

A SC-specific tariff plan (with associated rate) is available, called “Sponsored Calling Tariff Plan Sponsored Calling Tariff Plan”.

## Control Plans

The following control plans (CP) are used by the SC service.

Name	Description
SC Add - BPL	SC add sponsored number logic (used by BPL).
SC Delete - BPL	SC delete sponsored number logic (used by BPL).
HPLMN-MO VAS Service Logic – SCP	Overall VAS service logic control plan (contains SC Voice service logic). This CP is called by the Voice CP (HPLMN-MO).
HPLMN-MO	HPLMN-MO control plan, which calls the “HPLMN-MO VAS Service Logic – SCP” CP.

## Profile Fields

The following profile fields are used by the SC service.

Name	Type	Tag	Profile Block	Usage
SC Sponsored Numbers	LOPREFIX	2824001	App Specific 1 CCS Temporary Profile (App6)	Holds the list of sponsored numbers.
SC Temp Number	LOPREFIX	2824002	Temporary Storage	Used during service logic processing.
SC Service Active	BOOLEAN	2824003	Global Profile	Defines whether the SC service is active (globally).
SC Temp Entry	INTEGER	2824004	Temporary Storage	Used during service logic processing.
SC In Progress	BOOLEAN	2824005	Temporary Storage	Used during service logic processing to indicate that a sponsored call is in progress.

## Business Process Logic

The following BPLs are used by the SC service.

Field	Description
SCADD	Add a number to the SC list.
SCDEL	Delete a number from the SC list.

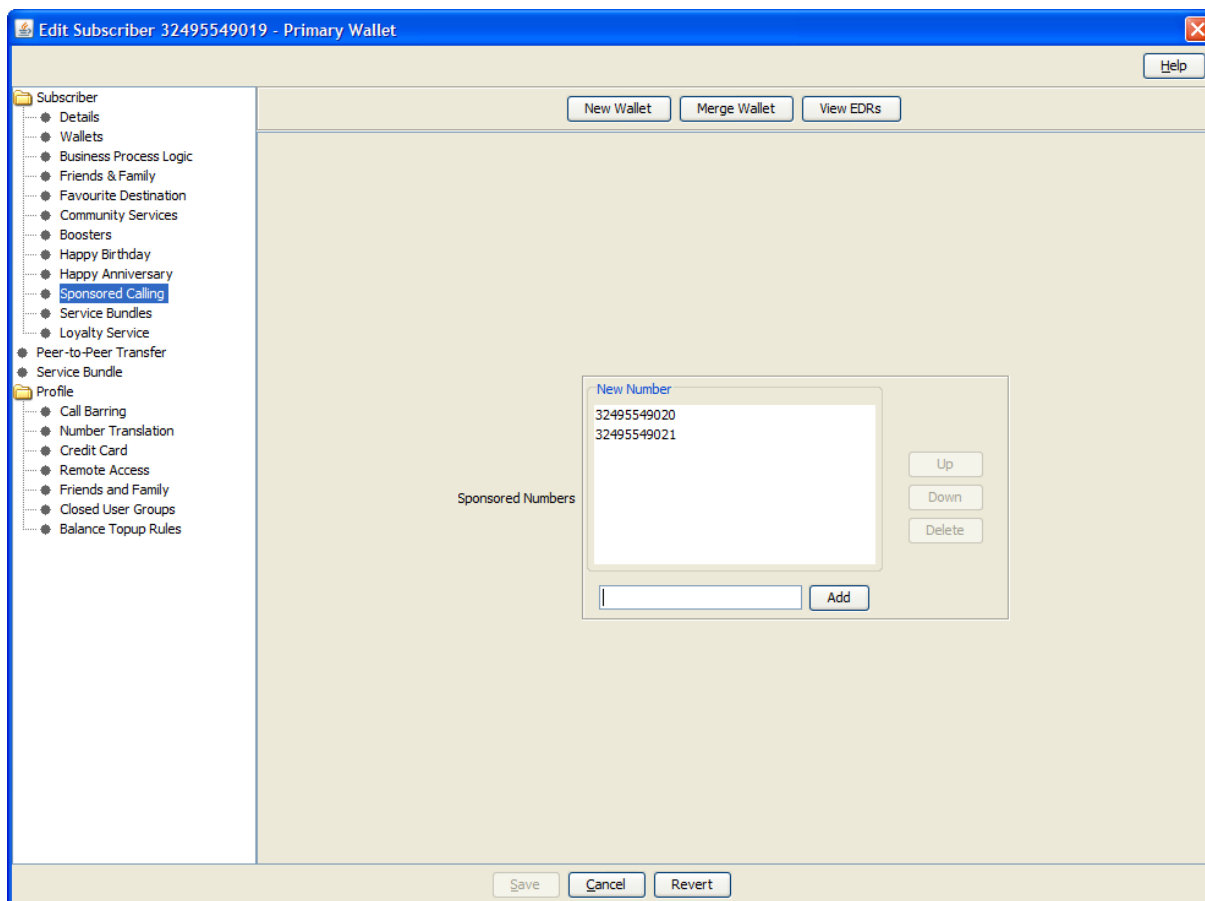
## Screens

The SC service uses one SPM custom screen:

- Subscriber

### Subscriber screen

Here is an example screen.



### Screens Template access

A standard NCC installation creates access rights for the custom SC screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

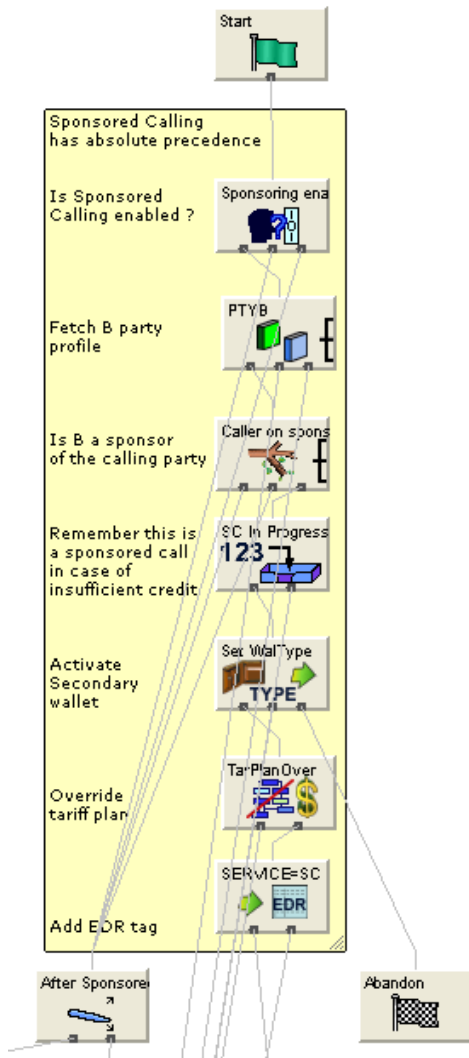
### Service logic

As with all VAS services, the Voice control plan has a "VAS Service Logic" sub control plan, called "HPLMN-MO VAS Service Logic – SCP". This "VAS Service Logic" control plan contains the SC service logic, and is only used for the HPLMN-MO capability.

The Voice service logic is situated at the start of the "VAS Service logic" CP, and as such, is processed before any of the other value added services.

### CC Service Logic

The SC service logic looks like this.

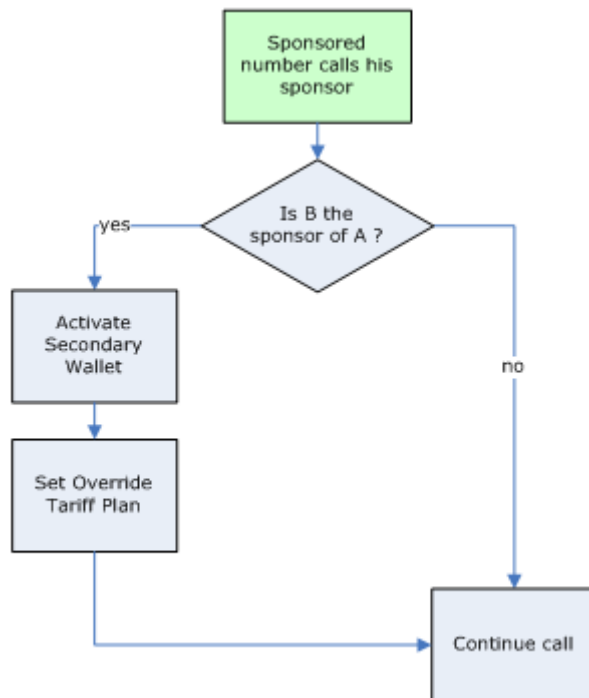


The “SC In Progress” Profile Field is set here, and is used later to restrict the Overdraft service, as the Overdraft service does not apply for sponsored calls. Please also refer to the *Overdraft Service logic* (on page 136).

### Flow charts

The flow chart below provides more information on how the SC service functions for the different call scenarios.

## Calling Card



## Peer to Peer Transfer

### Introduction

The Peer to Peer (P2P) credit transfer service allows subscribers to move credit between accounts that are connected to the Prepaid Charging solution.

The standard NCC installation sets up two P2P credit transfers per product type, but will allow for five P2P credit transfers per product type, in total.

There is no real P2P service logic, as it is all self care. For more information on P2P self care, see Prepaid Charging Service Template - Self Care. This topic focuses on general P2P configuration.

### Named Events

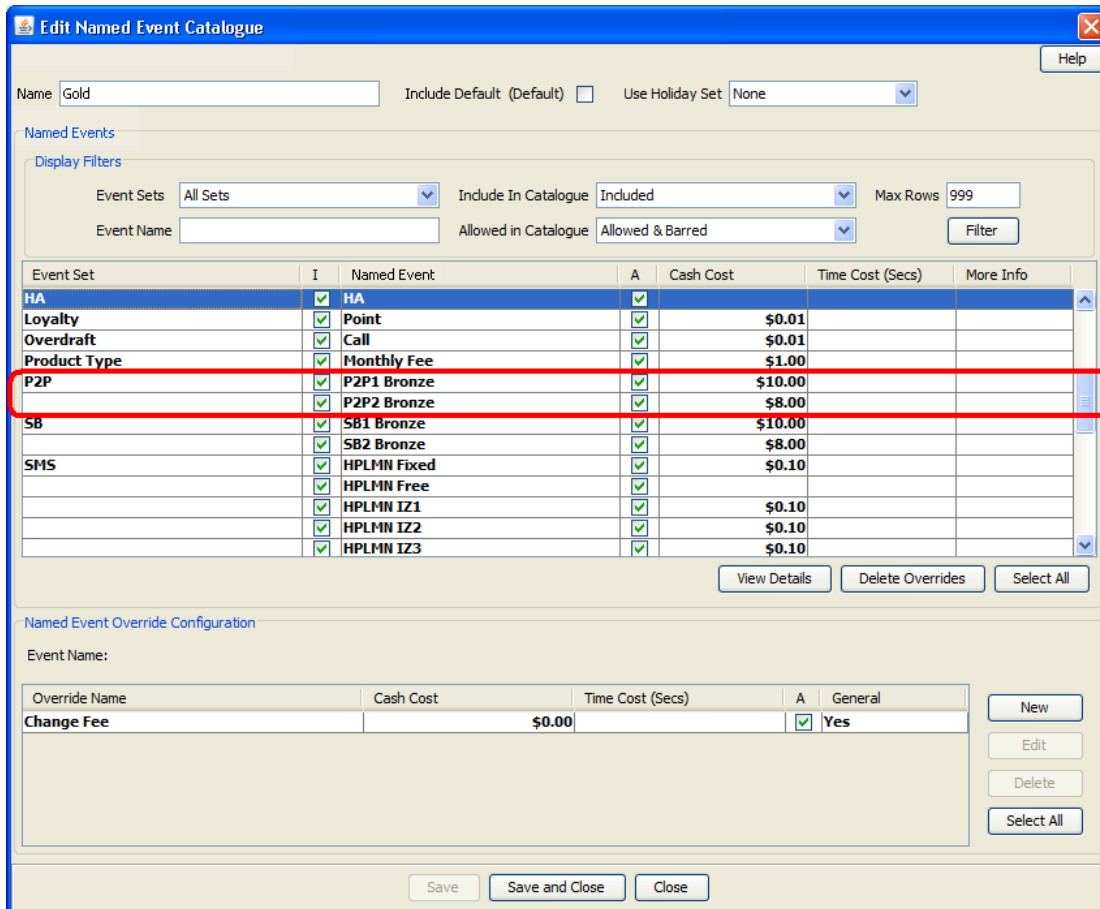
The following named events are used by the P2P service.

Field	Class	Description
P2P1 Bronze	P2P	Used by the P2P transfer "10 EUR Transfer Bronze"
P2P2 Bronze	P2P	Used by the P2P transfer "20 EUR Transfer Bronze"
P2P1 Silver	P2P	Used by the P2P transfer "10 EUR Transfer Silver"
P2P2 Silver	P2P	Used by the P2P transfer "20 EUR Transfer Silver"
P2P1 Gold	P2P	Used by the P2P transfer "10 EUR Transfer Gold"
P2P2 Gold	P2P	Used by the P2P transfer "20 EUR Transfer Gold"

### Example Event Set

These events are assigned to a product type specific named event catalogue, where they are overridden.

Prepaid Charging > Rating Management > Named Event Catalogue tab, select a named event catalogue and click **Edit**.



### Control Plans

The following control plans (CP) are used by the P2P service.

Name	Description
P2P IVR - SCP	P2P self-care logic. This CP is called by the overall IVR Self Care CP.
IVR Self Care	Overall IVR self care control plan, which calls VAS specific self care CPs.

### Profile Fields

The following profile fields are used by the P2P service.

Name	Type	Tag	Profile Block	Usage
P2P Service Active	BOOLEAN	2826000	Global Profile	Defines whether the P2P service is active (globally).



Name	Type	Tag	Profile Block	Usage
P2P Transfer Name	STRING	2826001	Temporary Storage	Used during service logic processing.
P2P Transfer 1	STRING	2826002	App Specific 2	Defines the P2P credit transfer 1.
P2P Transfer 2	STRING	2826003	App Specific 2	Defines the P2P credit transfer 2.
P2P Transfer 3	STRING	2826004	App Specific 2	Defines the P2P credit transfer 3.
P2P Transfer 4	STRING	2826005	App Specific 2	Defines the P2P credit transfer 4.
P2P Transfer 5	STRING	2826006	App Specific 2	Defines the P2P credit transfer 5.

## Notifications

The following notifications are used by the P2P service.

Field	Notification text
P2P Transfer - recipient	\$1 has transferred the following credit into your account: \$2.
P2P Transfer - purchaser	\$1 has received the following credit which has been deducted from your account: \$2.

**Note:** Only the English text is present in the table above. Other languages will also be present on a standard NCC installation.

These notifications are used as transfer notifications.

## Recharge Types

The following recharge types (RT) are used by the P2P service.

Name	Usage
P2P1 Bronze	Used by the P2P transfer “10 EUR Transfer Bronze”.
P2P2 Bronze	Used by the P2P transfer “20 EUR Transfer Bronze”.
P2P1 Silver	Used by the P2P transfer “10 EUR Transfer Silver”.
P2P2 Silver	Used by the P2P transfer “20 EUR Transfer Silver”.
P2P1 Gold	Used by the P2P transfer “10 EUR Transfer Gold”.
P2P2 Gold	Used by the P2P transfer “20 EUR Transfer Gold”.

## Credit transfers

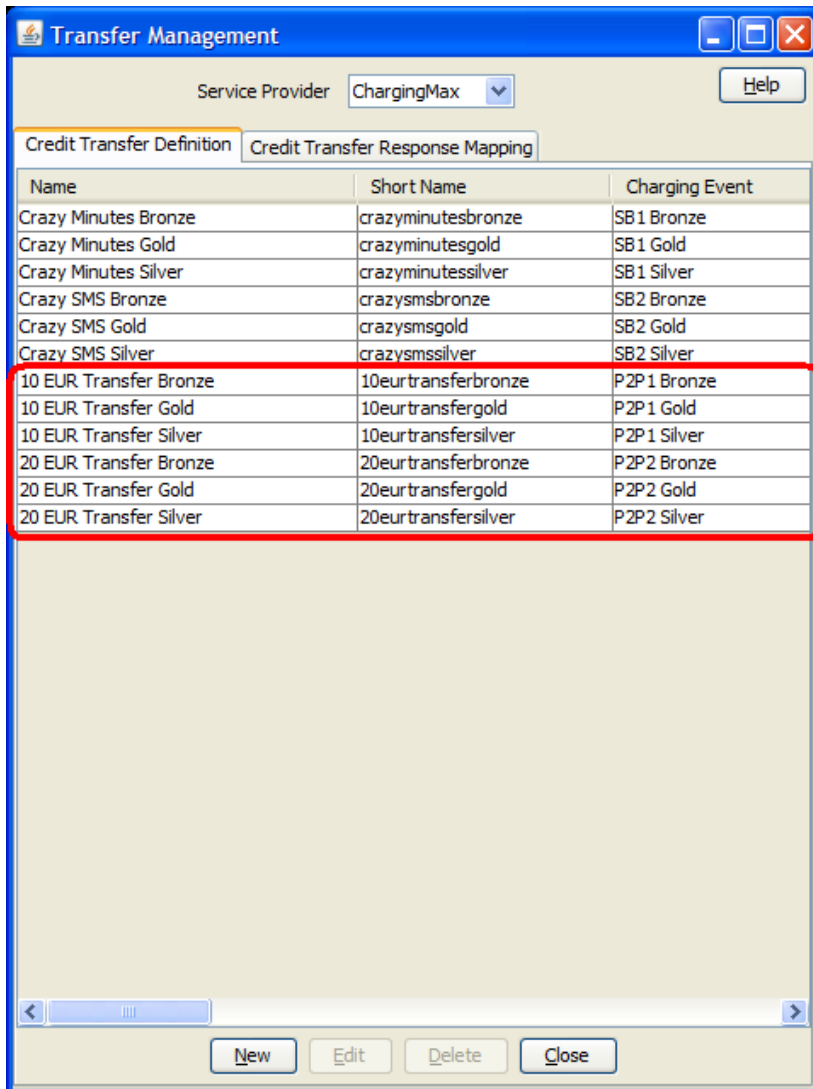
The following credit transfers (TT) are used by the P2P service.

Name	Usage
10 EUR Transfer Bronze	P2P credit transfer 1 for product type Bronze.
20 EUR Transfer Bronze	P2P credit transfer 2 for product type Bronze.
10 EUR Transfer Silver	P2P credit transfer 1 for product type Silver.
20 EUR Transfer Silver	P2P credit transfer 2 for product type Silver.
10 EUR Transfer Gold	P2P credit transfer 1 for product type Gold.

Name	Usage
20 EUR Transfer Gold	P2P credit transfer 2 for product type Gold.

**Example screen**

Here is an example Prepaid Charging Transfer Management screen, displaying the P2P credit transfers.



**Screens**

The P2P service uses two SPM custom screens:

- Product Type
- Subscriber

## Product Type screen

Here is an example screen.

**Edit Product Type** [Close] [Help]

- ▼ Dyppass numbers
  - Creditcard Recharge Rules
  - Second Currency
  - What's New
  - Help & Info
  - Product Type Swaps
  - Node Options
  - Activation Credits
  - Remote Access
  - Friends and Destination
  - Friends and Family
  - Promotional Destination Rates
  - Cumulative Balances
  - Real-Time Wallet Notifications
  - Periodic Charges
  - Adjustments
  - Wallet Life Cycle
- ▼ Subscriber Profile Limitations
- ▼ Profile
  - Friends & Family Config
  - Favourite Destination Config
  - Balance Dependand Rating Co
  - Closed User Group Config
  - Community Services Config
  - Overdraft Config
  - Home Zone Config
  - Heavy User Config
  - Booster 1 Config
  - Booster 2 Config
  - Booster 3 Config
  - Booster 4 Config
  - Booster 5 Config
  - Happy Birthday Config
  - Happy Anniversary Config
  - Peer to Peer Config
  - Service Bundles Config
  - Loyalty Service Config

Peer to Peer Transfer 1 (short name)

Peer to Peer Transfer 2 (short name)

Peer to Peer Transfer 3 (short name)

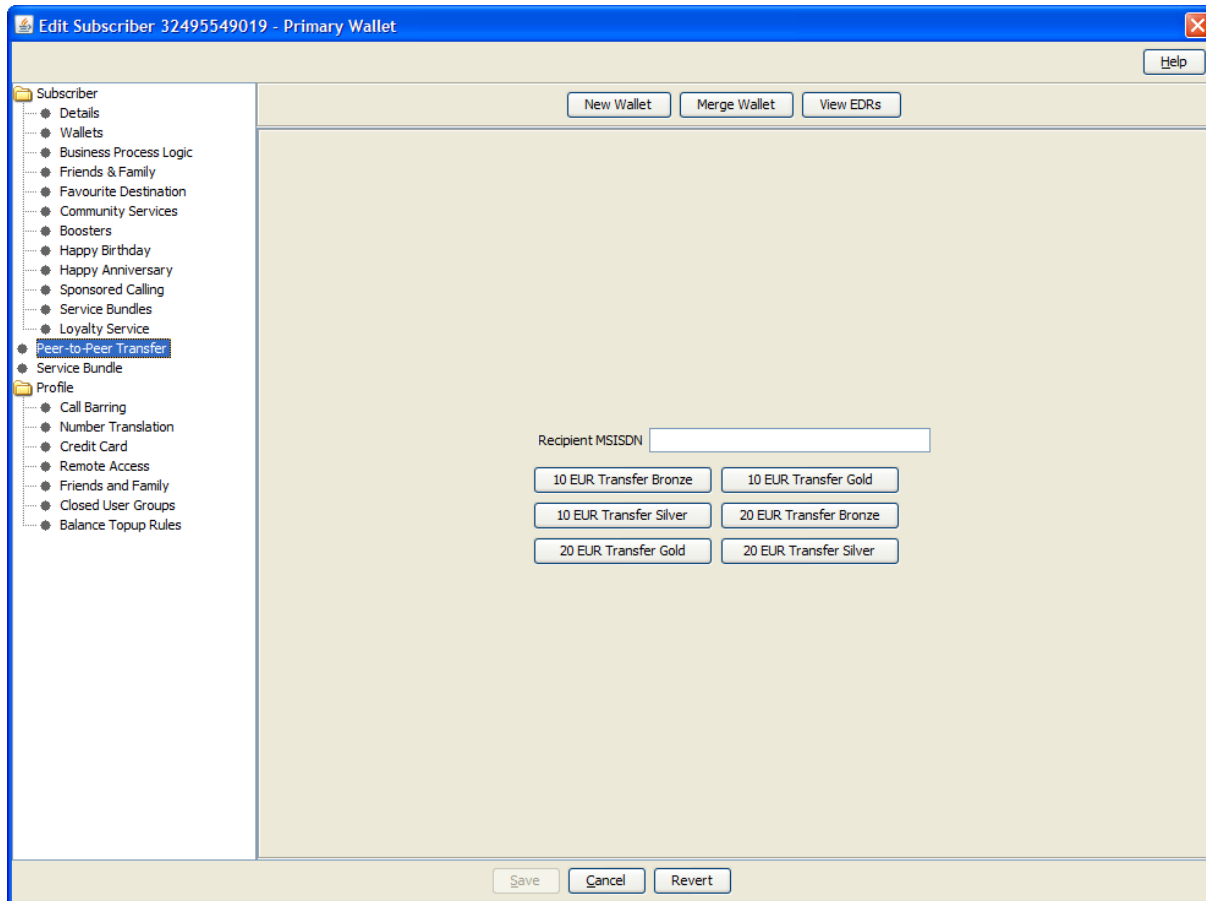
Peer to Peer Transfer 4 (short name)

Peer to Peer Transfer 5 (short name)

[Save] [Cancel]

### Subscriber screen

Here is an example screen.



### Screens Template access

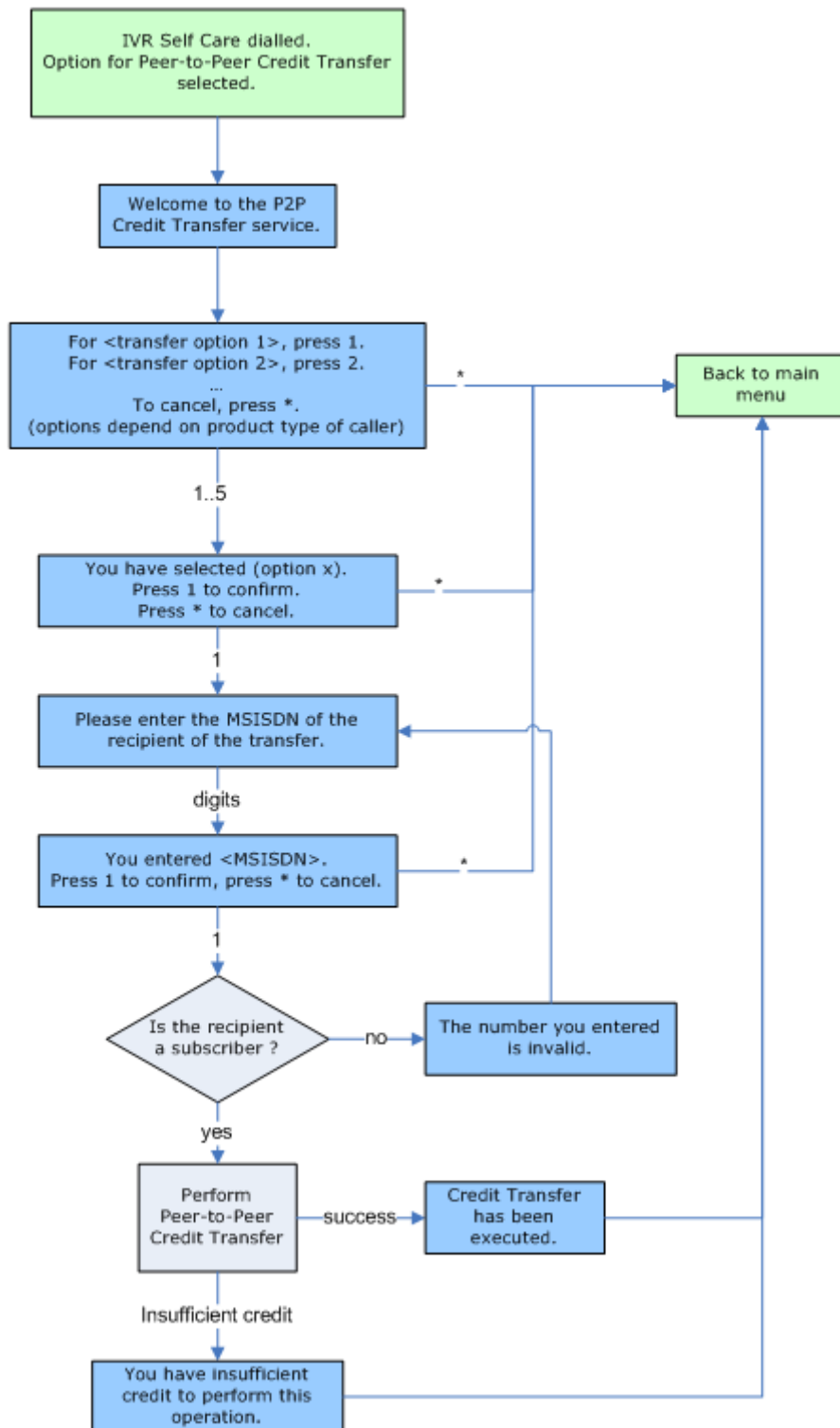
A standard NCC installation creates access rights for the custom P2P screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

### Flow charts

The flow chart below provides more information on how the P2P service functions for the different call scenarios.

## Peer to Peer Credit Transfer Self Care



## Service Bundles

### Introduction

The Service Bundles (SB) service allows subscribers to convert purchased credit into credit which is available for use with a specific service.

For example, the subscriber could purchase a "Crazy SMS" package of 100 SMS for use within the next day for only one EUR.

In addition to the ability to define a one-off purchase of a bundle, the subscriber may choose to make a regular transfer of credit for a particular service. For example the "Crazy SMS" pack may provide a monthly option whereby the service provides 100 SMS for use in the next 30 days for a recurring charge of E10.

This may be a one-off purchase or a periodic operation.

The standard NCC installation sets up two SB credit transfers per product type, but will allow for five SB credit transfers per product type, in total.

There is no real SB service logic, as it is all self-care. For more information on SB self-care, see Prepaid Charging Service Template - Self Care. This topic focuses on general SB configuration.

### Named Events

The following named events are used by the SB service.

Field	Class	Description
SB1 Bronze	SB	Used by the SB transfer "Crazy Minutes Bronze", and by the SB periodic charge "SB1Bronze".
SB2 Bronze	SB	Used by the SB transfer "Crazy SMS Bronze", and by the SB periodic charge "SB2Bronze".
SB1 Silver	SB	Used by the SB transfer "Crazy Minutes Silver", and by the SB periodic charge "SB1Silver".
SB2 Silver	SB	Used by the SB transfer "Crazy SMS Silver", and by the SB periodic charge "SB2Silver".
SB1 Gold	SB	Used by the SB transfer "Crazy Minutes Gold", and by the SB periodic charge "SB1Gold".
SB2 Gold	SB	Used by the SB transfer "Crazy SMS Gold", and by the SB periodic charge "SB2Gold".

### Example Event Set

These events are assigned to a product type specific named event catalogue, where they are overridden.

Prepaid Charging > Rating Management > Named Event Catalogue tab, select a named event catalogue and click **Edit**.

## Control Plans

The following control plans (CP) are used by the SB service.

Name	Description
SB IVR – SCP	SB self-care logic. This CP is called by the overall IVR Self Care CP.
SB Subscribe – BPL	SB subscribe logic (used by BPL).
SB Unsubscribe – BPL	SB unsubscribe logic (used by BPL).
IVR Self Care	Overall IVR self care control plan, which calls VAS specific self care CPs.

## Profile Fields

The following profile fields are used by the SB service.

Name	Type	Tag	Profile Block	Usage
SB Service Active	BOOLEAN	2827000	Global Profile	Defines whether the SB service is active (globally).

Name	Type	Tag	Profile Block	Usage
SB Name	STRING	2827001	Temporary Storage	Used during service logic processing.
SB Single Shot	BOOLEAN	2827005	Temporary Storage	Used during service logic processing.
SB Name 1	STRING	2827006	App Specific 2	Defines the SB credit transfer 1.
SB Name 2	STRING	2827007	App Specific 2	Defines the SB credit transfer 2.
SB Name 3	STRING	2827008	App Specific 2	Defines the SB credit transfer 3.
SB Name 4	STRING	2827009	App Specific 2	Defines the SB credit transfer 4.
SB Name 5	STRING	28270010	App Specific 2	Defines the SB credit transfer 5.

## Notifications

The following notifications are used by the SB service.

Field	Notification text
SB Success	Your monthly Service Bundle has been purchased.
SB Failure	Your monthly Service Bundle purchase did not succeed.
SB Disabled	Your monthly Service Bundle subscription has been canceled.

**Note:** Only the English text is present in the table above. Other languages will also be present on a standard NCC installation.

These notifications are used by the periodic subscription SB transfers.

## Recharge Types

The following recharge types (RT) are used by the SB service.

Name	Usage
SB1 Bronze	Used by the SB transfer “Crazy Minutes Bronze”, and by the SB periodic charge “SB1Bronze”.
SB2 Bronze	Used by the SB transfer “Crazy SMS Bronze”, and by the SB periodic charge “SB2Bronze”.
SB1 Silver	Used by the SB transfer “Crazy Minutes Silver”, and by the SB periodic charge “SB1Silver”.
SB2 Silver	Used by the SB transfer “Crazy SMS Silver”, and by the SB periodic charge “SB2Silver”.
SB1 Gold	Used by the SB transfer “Crazy Minutes Gold”, and by the SB periodic charge “SB1Gold”.
SB2 Gold	Used by the SB transfer “Crazy SMS Gold”, and by the SB periodic charge “SB2Gold”.

## Credit transfers

The following credit transfers (TT) are used by the SB Service.

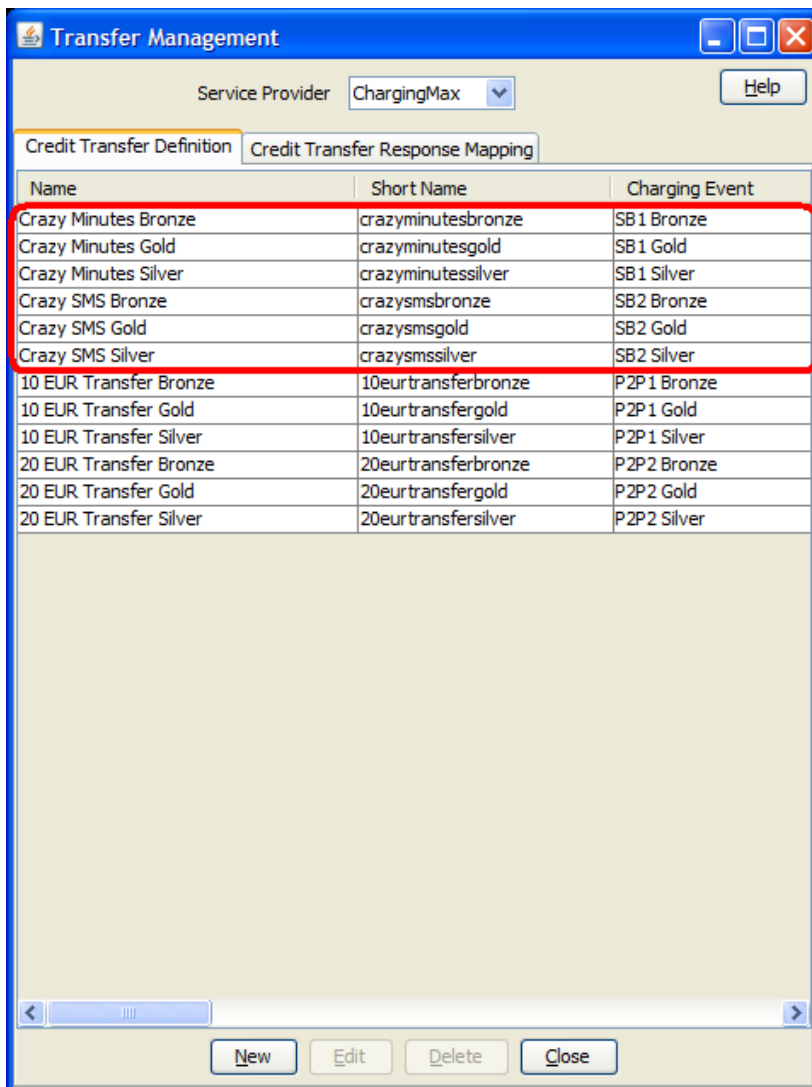
Name	Usage
10 EUR Transfer Bronze	P2P credit transfer 1 for product type Bronze.



Name	Usage
20 EUR Transfer Bronze	P2P credit transfer 2 for product type Bronze.
10 EUR Transfer Silver	P2P credit transfer 1 for product type Silver.
20 EUR Transfer Silver	P2P credit transfer 2 for product type Silver.
10 EUR Transfer Gold	P2P credit transfer 1 for product type Gold.
20 EUR Transfer Gold	P2P credit transfer 2 for product type Gold.

### Example screen

Here is an example Prepaid Charging Transfer Management screen, displaying the SB credit transfers.



## Business Process Logic

The following BPLs are used by the SB service.

Field	Description
SBSUBSCRIBE	Subscribe to a periodic SB credit transfer.
SBUNSUBSCRIBE	Unsubscribe from a periodic SB credit transfer.

## Periodic Charges

The following periodic charge (PC) is used by the SB service.

Name	Usage
SB1Bronze	This PC determines whether the user has subscribed to the SB 1 credit transfer and debits a SB periodic fee. This PC is used for Bronze subscribers.
SB2Bronze	This PC shall determine whether the user has subscribed to the SB 2 credit transfer and debits an SB periodic fee. This PC is used for Bronze subscribers.
SB3Bronze	This PC determines whether the user has subscribed to the SB 3 credit transfer and debits an SB periodic fee. This PC is used for Bronze subscribers.
SB4Bronze	This PC determines whether the user has subscribed to the SB 4 credit transfer and debits an SB periodic fee. This PC is used for Bronze subscribers.
SB5Bronze	This PC determines whether the user has subscribed to the SB 5 credit transfer and debits an SB periodic fee. This PC is used for Bronze subscribers.
SB1Silver	This PC determines whether the user has subscribed to the SB 1 credit transfer and debits an SB periodic fee. This PC is used for Silver subscribers.
SB2Silver	This PC determines whether the user has subscribed to the SB 2 credit transfer and debits an SB periodic fee. This PC is used for Silver subscribers.
SB3Silver	This PC determines whether the user has subscribed to the SB 3 credit transfer and debits an SB periodic fee. This PC is used for Silver subscribers.
SB4Silver	This PC determines whether the user has subscribed to the SB 4 credit transfer and debits an SB periodic fee. This PC is used for Silver subscribers.
SB5Silver	This PC determines whether the user has subscribed to the SB 5 credit transfer and debits an SB periodic fee. This PC is used for Silver subscribers.
SB1Gold	This PC determines whether the user has subscribed to the SB 1 credit transfer and debits an SB periodic fee. This PC is used for Gold subscribers.

Name	Usage
SB2Gold	This PC determines whether the user has subscribed to the SB 2 credit transfer and debits an SB periodic fee. This PC is used for Gold subscribers.
SB3Gold	This PC determines whether the user has subscribed to the SB 3 credit transfer and debits an SB periodic fee. This PC is used for Gold subscribers.
SB4Gold	This PC determines whether the user has subscribed to the SB 4 credit transfer and debits an SB periodic fee. This PC is used for Gold subscribers.
SB5Gold	This PC determines whether the user has subscribed to the SB 5 credit transfer and debits an SB periodic fee. This PC is used for Gold subscribers.

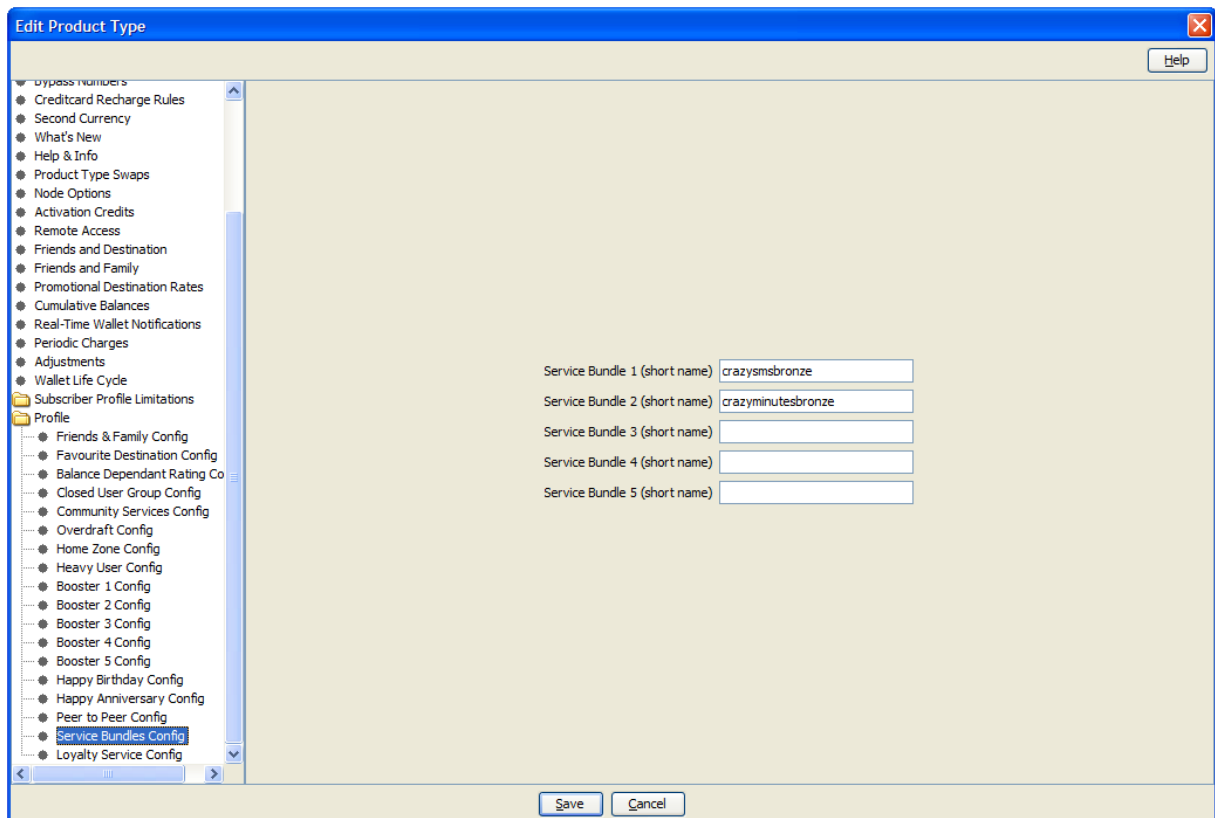
## Screens

The SB service uses three SPM custom screens:

- One Product Type screen
- Two Subscriber screens

### Product Type screen

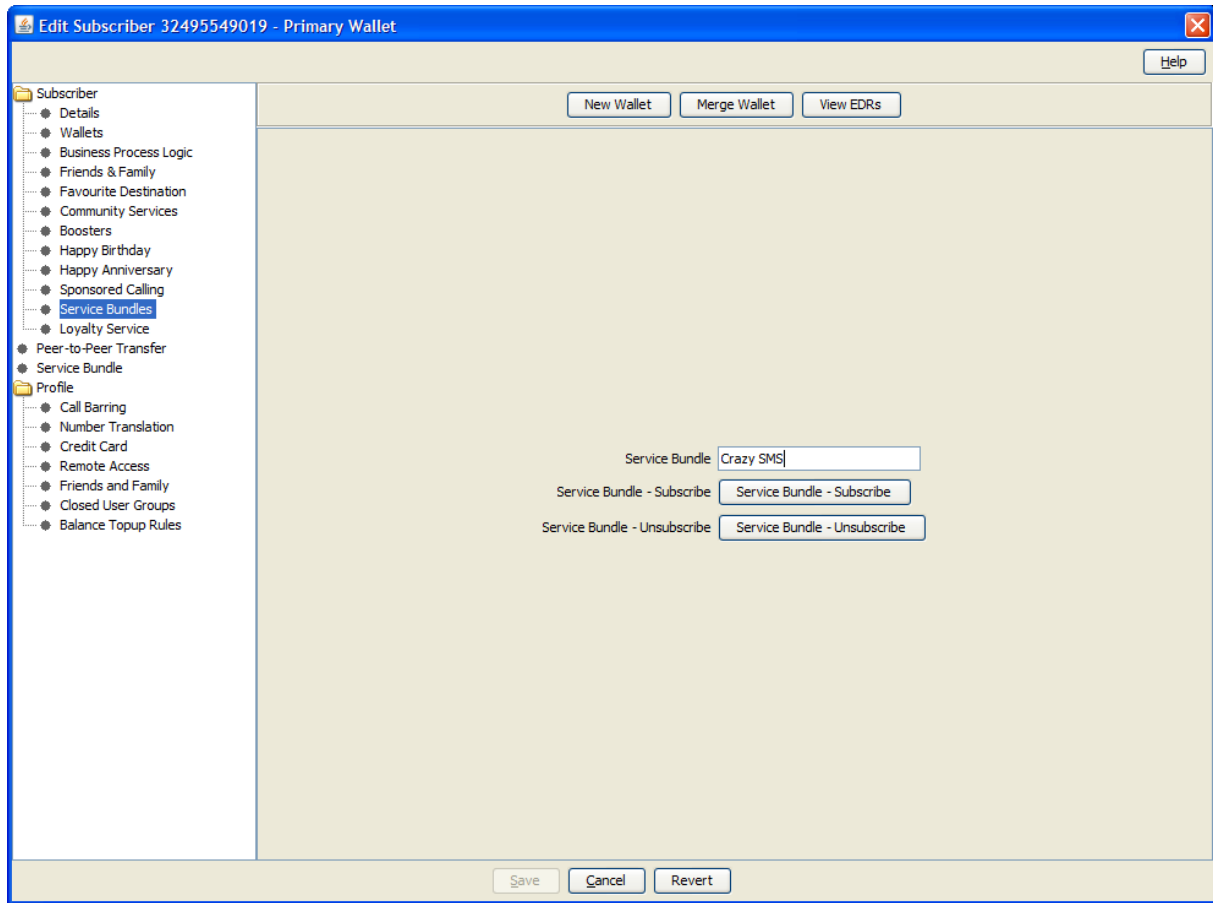
Here is an example screen.



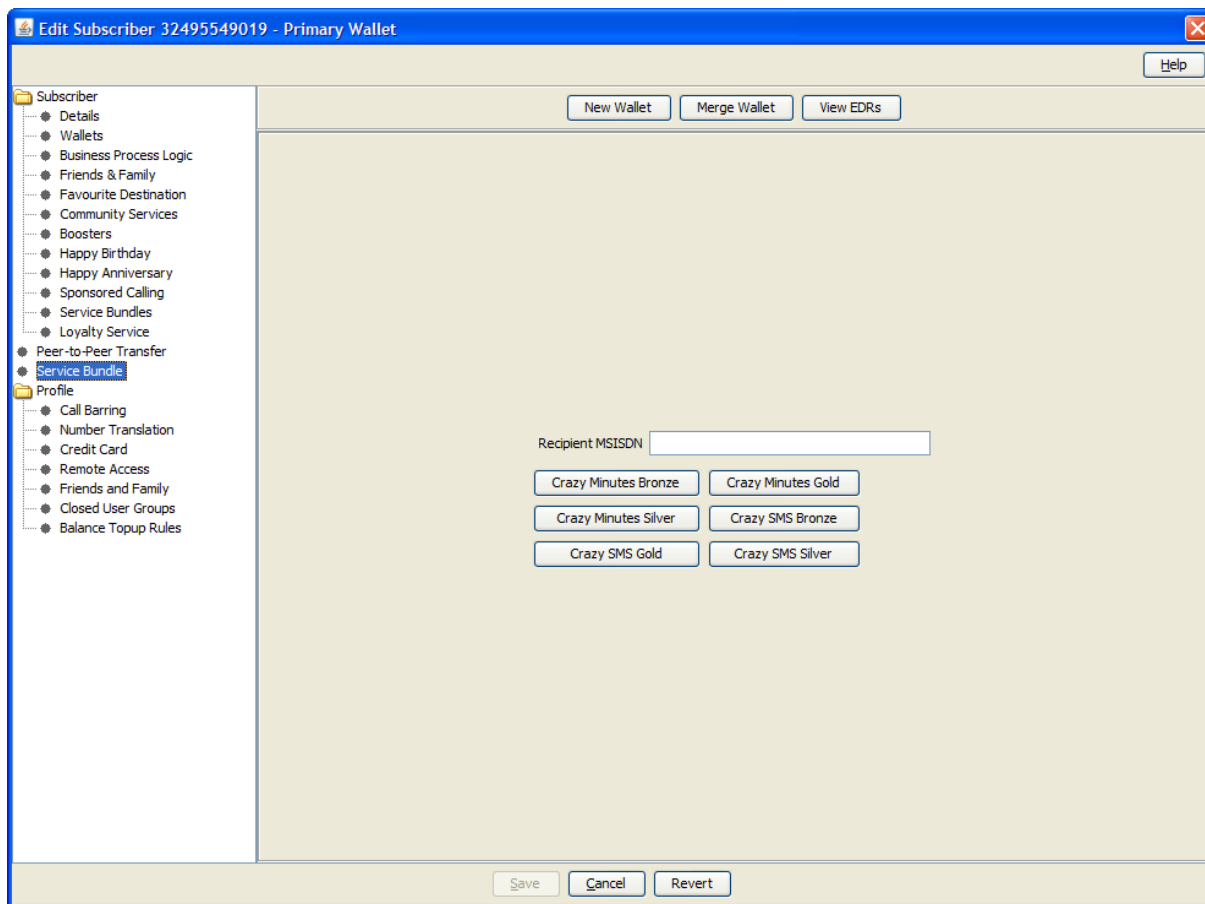
The names are used during processing, and need to refer to the actual names of the credit transfers.

### Subscriber screens

Here is an example screen.



Here is an example screen.



The following configuration options are available on a subscriber level:

- Recipient MSISDN
- SB Transfers, which can be given to the recipient MSISDN

### Screens Template access

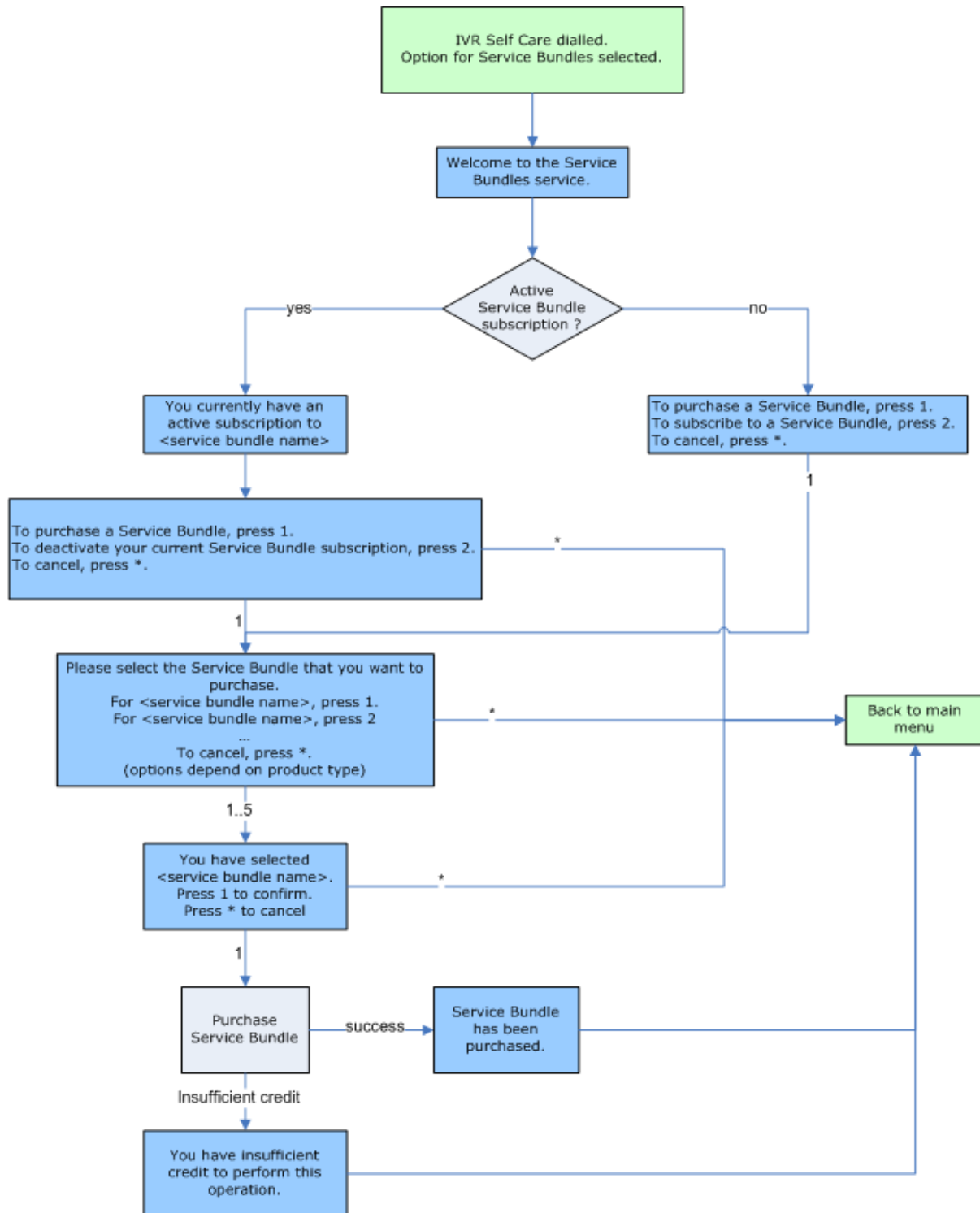
A standard NCC installation creates access rights for the custom SB screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

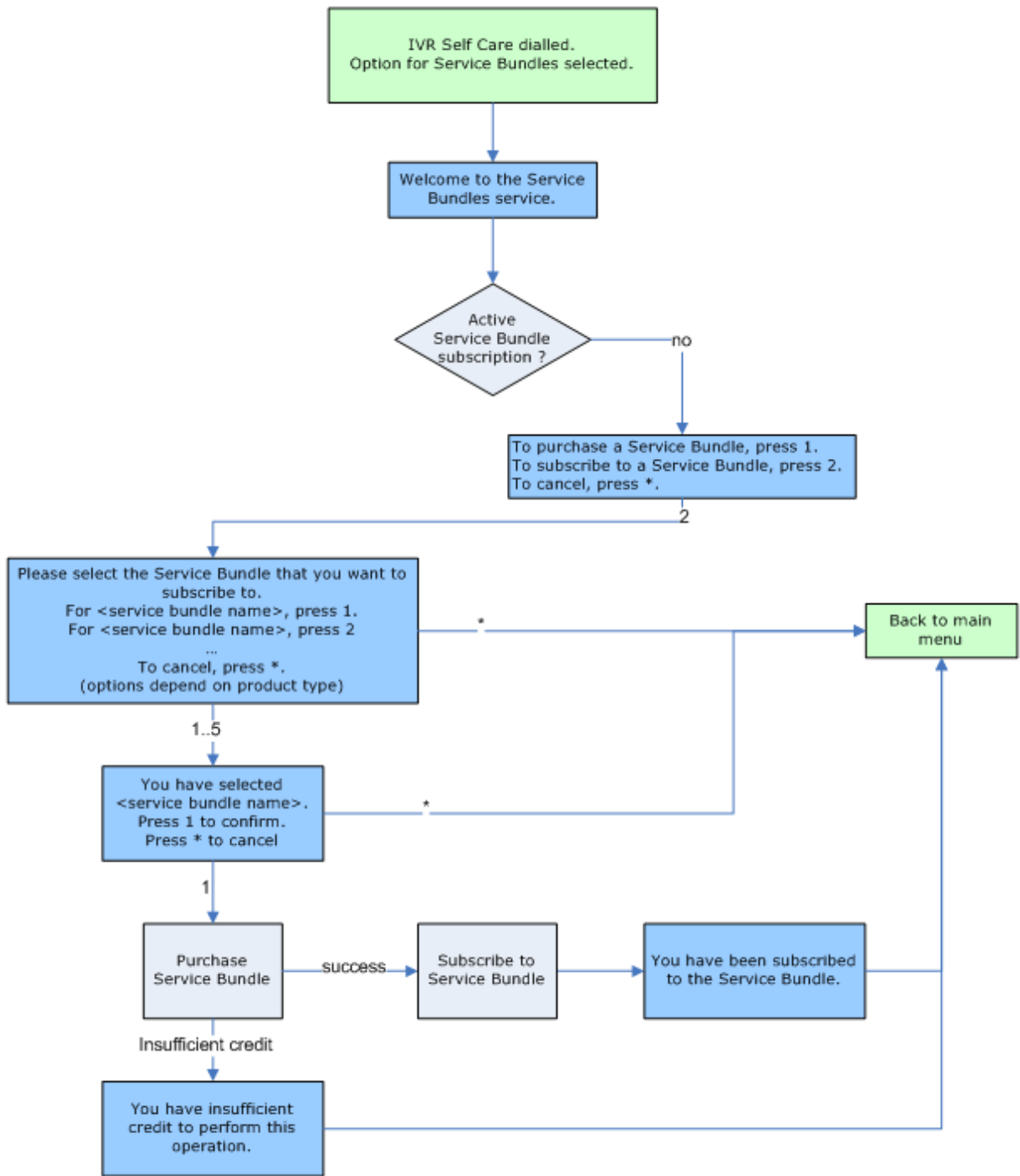
### Flow charts

The flow chart below provides more information on how the SB service functions for the different call scenarios.

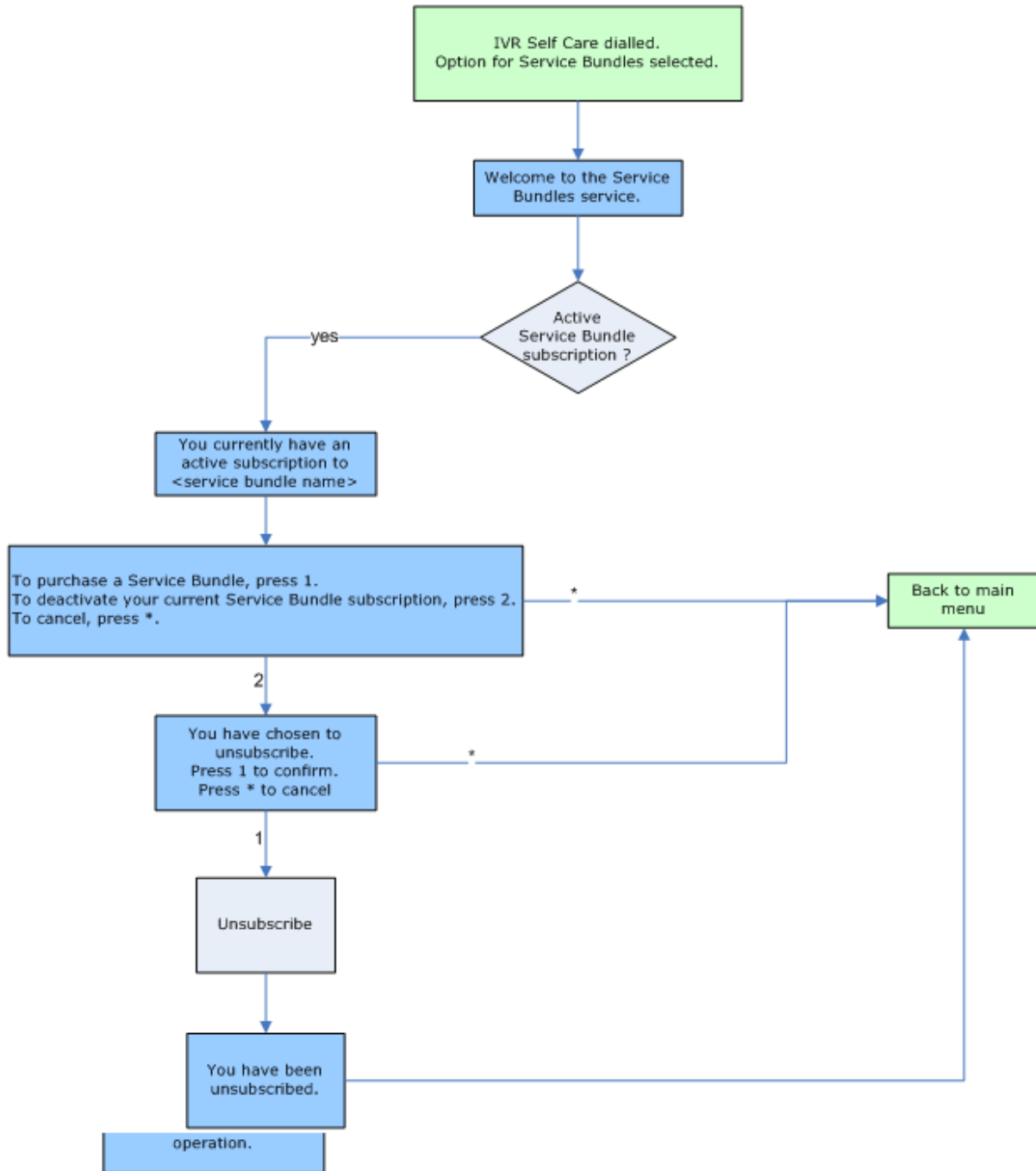
Service Bundles Self Care Purchase Bundle



**Service Bundles Self Care Subscribe**



### Service Bundles Self Care Unsubscribe



## Promotion Manager

### Introduction

The "Promotion Manager" service (PMX) allows the operator to define a number of counters (called 'trackers') which may be used for the application of rewards (called 'promotions') in real time or at the end of each period.



Each counter is defined with a name, along with the period which should be used for the promotion – the options which will be provided will be that rewards can be applied daily, weekly, monthly or by yearly basis. The unit of each tracker will allow cash, time or number of events to be used as the criteria of the promotion – so, for example, a tracker for talk time each day and a counter for cash spend each month may be configured. The number of events functionality allows counting of the number of calls, SMS, or any other Prepaid Charging VWS charged services to be tracked.

When each service and rating scenario is defined the trackers which should be updated are chosen to give the operator full control over which services will be used as part of the promotion.

The Prepaid Charging reward is calculated either at the end of the period during the expiration of the tracker or fired in real time during session closing when the promotion level is reached. This allows the operator to target short term usage campaigns or alternatively, look at longer term strategies where use over each month or year are used as the criteria of the promotion.

Based on a promotion level being reached either a tariff or credit reward may be given.

With a tariff reward, subscribers are automatically moved between product types depending on their level of spend. Thus, a customer with high spend can be rewarded by being moved to a different product type which may offer cheaper tariffs. Alternatively, a low user could be penalized by being moved to a product type which has a more expensive rate plan.

With a credit reward, credit may be awarded to the subscriber based on analysis of his tracker. For example, if the subscriber spent E10 last month on calling they might receive E5 of national talk time credit which may be used in the first week of the next month.

The operator is able to define:

- Promotion period (monthly, yearly, wallet)
- Tracker units (cash, SMS, time)
- Which services will be available to the FF service (voice, SMS).
- Which type of destination will be eligible for FF nomination (on-net, off-net, national fixed, international).
- Whether the reward is applied in real-time or when the tracker balance expires.
- Tariff reward (product type swap) or credit reward (top up operation).

## Balance Types

The following balance types are used by the PMX service.

Name	Type	Period	Units	Usage
Reward Credit Reward 1 Exp	Expenditure	Daily	Time	Used for PMX credit reward level 1.
Reward Credit Reward 2 Exp	Expenditure	Yearly	Cash	Used for PMX credit reward level 2.
Reward Credit Reward 3 Exp	Expenditure	Yearly	SMS	Used for PMX credit reward level 3.
Reward Tariff Reward Exp	Expenditure	Weekly	Cash	Used for PMX tariff reward.

The period and units can be changed. The table above represents a standard CPS installation.

## Expenditure plans

The following expenditure plans (EP) are used by the PMX service.

Name	Usage
Expenditure HPLMN-MO Fixed	Expenditure plan for HPLMN-MO national fixed calls.
Expenditure HPLMN-MO International	Expenditure plan for HPLMN-MO international calls.
Expenditure HPLMN-MO Off-net	Expenditure plan for HPLMN-MO off-net calls.
Expenditure HPLMN-MO On-net	Expenditure plan for HPLMN-MO on-net calls.
Expenditure SMS-MO Fixed	Expenditure plan for SMS-MO national fixed SMSs.
Expenditure SMS-MO International	Expenditure plan for SMS-MO international SMSs.
Expenditure SMS-MO Off-net	Expenditure plan for SMS-MO off-net SMSs.
Expenditure SMS-MO On-net	Expenditure plan for SMS-MO on-net SMSs.

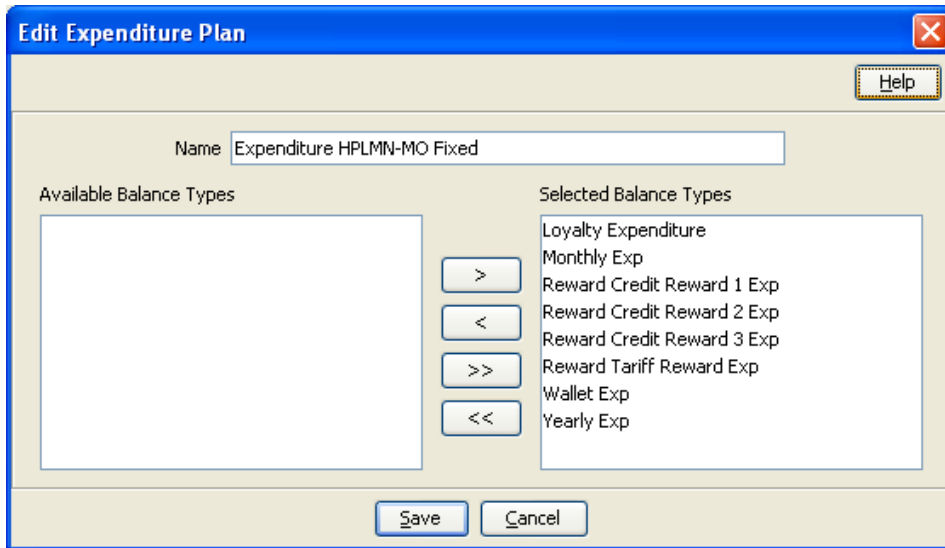
## Screens

The expenditure plans above contain the PMX expenditure balance types (see *Balance Types*), along with the standard expenditure balance types (monthly, yearly, wallet), and possibly the LO expenditure balance type (see *Balance Types*). The operator configures which expenditure plan contains which expenditure balance types.

The screenshot shows the 'Rating Management' application window. At the top, there is a 'Service Provider' dropdown menu set to 'Boss' and a 'Help' button. Below this is a navigation menu with several tabs: 'Named Event', 'Discount Periods', 'Charge Periods', 'Balance Type Cascades', 'Tariff Plan', 'Tariff Plan Selector', 'Rate Tables', 'Discount Sets', 'CLI-DN', 'Weekly', 'Holiday', 'Named Event Catalogue', 'Low Credit Notification Config', 'Tax Plan', 'Expenditure Plan', 'Cross Balance Type Cascades', and 'Reservation Config'. The 'Expenditure Plan' tab is currently selected. The main area displays a table with the following data:

Name	Change User	Change Date
Expenditure HPLMN-MO Fixed	SMF	2010-03-22 08:53:26
Expenditure HPLMN-MO International	SMF	2010-03-22 08:53:29
Expenditure HPLMN-MO Off-net	SMF	2010-03-22 08:53:24
Expenditure HPLMN-MO On-net	SU	2010-04-06 08:34:33
Expenditure SMS-MO Fixed	SMF	2010-03-22 08:53:28
Expenditure SMS-MO International	SMF	2010-03-22 08:53:38
Expenditure SMS-MO Off-net	SMF	2010-03-22 08:53:26
Expenditure SMS-MO On-net	SMF	2010-03-22 08:53:23

At the bottom of the window, there are four buttons: 'New', 'Edit', 'Delete', and 'Close'.



## Expenditure tracking

### Voice

For voice, the expenditure plans are assigned to the CLI-DN pairs to enable expenditure tracking. The operator configures which tariff plans use the functionality.

**Example:** Rating Management screen, CLI-DN tab, **Edit**.

### SMS

For SMS, the expenditure plans are assigned to the named events to enable expenditure tracking. The operator configures which named events use the functionality.

**Example:** Rating Management screen, **Named Events** tab, **Edit**.

## Notifications

The following notifications are used by the PMX service.

Field	Notification text
Reward Credit	You have been awarded with <i>amount</i> Dollar.
Reward Tariff Bronze	Your Tariff plan has been changed to Bronze.
Reward Tariff Silver	Your Tariff plan been changed to Silver.
Reward Tariff Gold	Your Tariff plan has been changed to Gold.

**Note:** Only the English text is present in the table above. Other languages will also be present on a standard NCC installation.

These notifications are used as PMX promotion notifications.

## Reward promotions

The following reward promotions are used by the PMX service.

Name	Usage
Credit Reward 1 Exp Bronze	Credit reward level 1 for Bronze subscribers
Credit Reward 2 Exp Bronze	Credit reward level 2 for Bronze subscribers
Credit Reward 3 Exp Bronze	Credit reward level 3 for Bronze subscribers
Credit Reward 1 Exp Silver	Credit reward level 1 for Silver subscribers
Credit Reward 2 Exp Silver	Credit reward level 2 for Silver subscribers
Credit Reward 3 Exp Silver	Credit reward level 3 for Silver subscribers
Credit Reward 1 Exp Gold	Credit reward level 1 for Gold subscribers
Credit Reward 2 Exp Gold	Credit reward level 2 for Gold subscribers
Credit Reward 3 Exp Gold	Credit reward level 3 for Gold subscribers
Reward Tariff Bronze – Bronze	Tariff reward for a product type swap (Bronze – Bronze)
Reward Tariff Bronze – Silver	Tariff reward for a product type swap (Bronze – Silver)
Reward Tariff Bronze – Gold	Tariff reward for a product type swap (Bronze – Gold)
Reward Tariff Silver – Bronze	Tariff reward for a product type swap (Silver – Bronze)
Reward Tariff Silver – Silver	Tariff reward for a product type swap (Silver – Silver)
Reward Tariff Silver – Gold	Tariff reward for a product type swap (Silver – Gold)
Reward Tariff Gold – Bronze	Tariff reward for a product type swap (Gold – Bronze)
Reward Tariff Gold – Silver	Tariff reward for a product type swap (Gold – Silver)
Reward Tariff Gold - Gold	Tariff reward for a product type swap (Gold - Gold)

## Loyalty Scheme

### Introduction

The Loyalty Scheme (LO) service allows subscribers to collect points through the use of their prepaid subscription. At any time the subscriber may choose to convert these points into any type of credit based on the scheme provided.

The PCST configures five loyalty scheme types per product type.

A self care LO service is also available. For more information on LO self care, see Prepaid Charging Service Template - Self Care.

### Balance Types

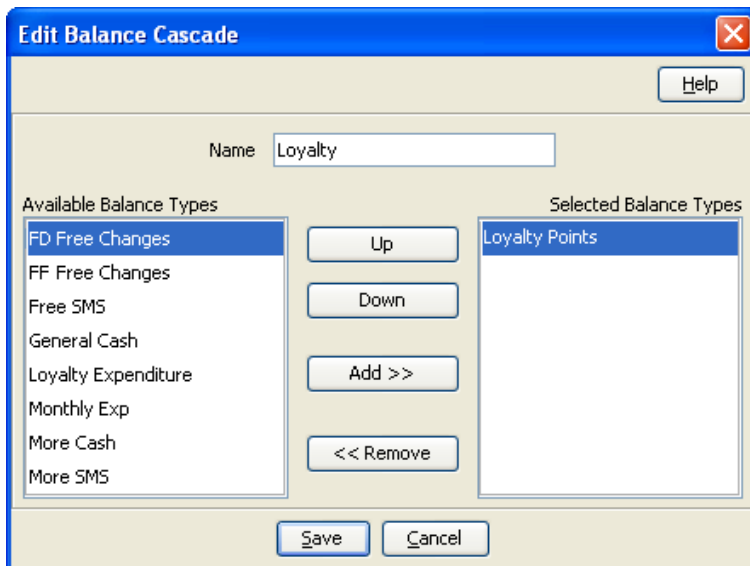
The following balance types are used by the LO service.

Name	Type	Period	Units	Usage
Loyalty Expenditure	Expenditure	Monthly	Cash	Used for loyalty reward (tracker balance type)
Loyalty Points	Expenditure	Monthly	SMS	Used for loyalty reward (reward balance type)

The period and units can be changed. The table above represents a standard NCC installation.

## Balance Cascade

Additionally, a “Loyalty” balance type cascade is created, which consists only of the “Loyalty Points” balance type.



## Named Events

The following named event is used by the LO service.

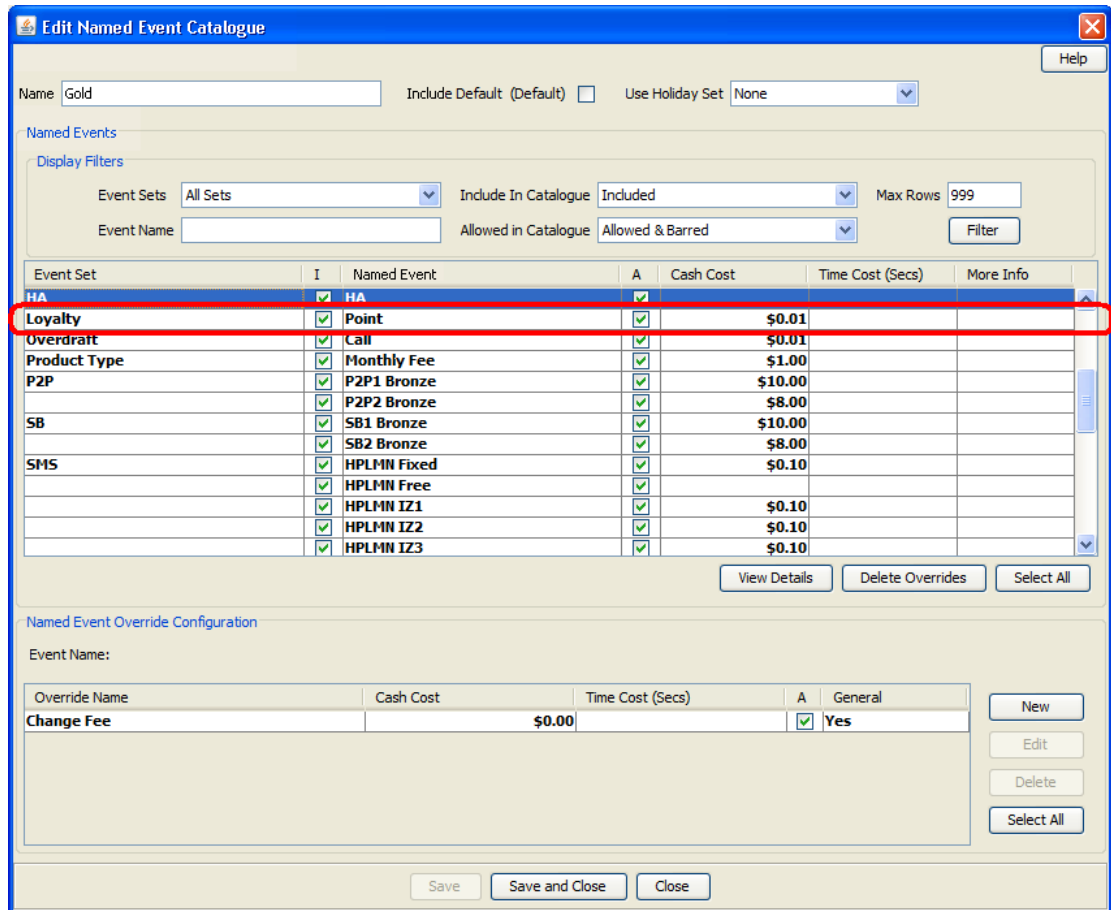
Field	Class	Description
Point	Loyalty	Cost of 1 loyalty point. Used by the LO IVR service logic to turn loyalty points into credit.

## Example Event Set

This event is assigned to a product type specific named event catalogue, where it is overridden.



Prepaid Charging > Rating Management > Named Event Catalogue tab, select a named event catalogue and click **Edit**.



## Control Plans

The following control plans (CP) are used by the LO service.

Name	Description
LO IVR - SCP	LO Self-Care logic. This CP is called by the overall IVR Self Care CP.
IVR Self Care	Overall IVR self care control plan, which calls VAS specific self care CPs.

## Profile Fields

The following profile fields are used by the LO service.

Name	Type	Tag	Profile Block	Usage
LO Service Active	BOOLEAN	2829000	Global Profile	Defines whether the LO service is active (globally).
LO Subscription	BOOLEAN	2829001	App Specific 1	Tracks LO subscription for the subscriber.

Name	Type	Tag	Profile Block	Usage
LO Price 1	STRING	2829009	App Specific 2	Holds the cost for loyalty type 1 (product type). (price to pay for LO Service Bundle 1).
LO Price 2	STRING	2829010	App Specific 2	Holds the cost for loyalty type 2 (product type). (price to pay for LO Service Bundle 2).
LO Price 3	STRING	2829011	App Specific 2	Holds the cost for loyalty type 3 (product type). (price to pay for LO Service Bundle 3).
LO Price 4	STRING	2829012	App Specific 2	Holds the cost for loyalty type 4 (product type). (price to pay for LO Service Bundle 4).
LO Price 5	STRING	2829013	App Specific 2	Holds the cost for loyalty type 5 (product type). (price to pay for LO Service Bundle 5).

## Expenditure plans

The following expenditure plans (EP) are used by the LO service.

Name	Usage
Expenditure HPLMN-MO Fixed	Expenditure plan for HPLMN-MO national fixed calls.
Expenditure HPLMN-MO International	Expenditure plan for HPLMN-MO international calls.
Expenditure HPLMN-MO Off-net	Expenditure plan for HPLMN-MO off-net calls.
Expenditure HPLMN-MO On-net	Expenditure plan for HPLMN-MO on-net calls.
Expenditure SMS-MO Fixed	Expenditure plan for SMS-MO national fixed SMSs.
Expenditure SMS-MO International	Expenditure plan for SMS-MO international SMSs.
Expenditure SMS-MO Off-net	Expenditure plan for SMS-MO off-net SMSs.
Expenditure SMS-MO On-net	Expenditure plan for SMS-MO on-net SMSs.

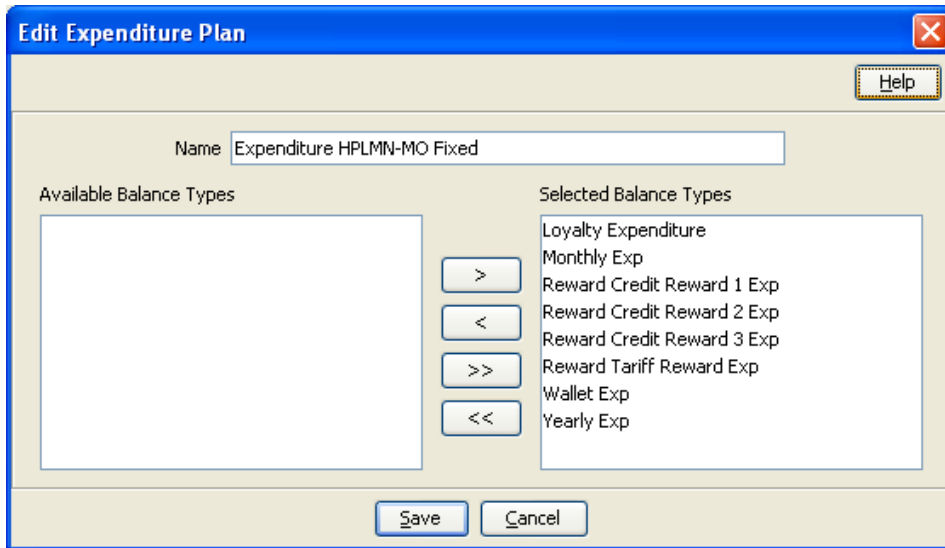
## Screens

The expenditure plans above contain the LO expenditure balance types (see *Balance Types*), along with the standard expenditure balance types (Monthly, Yearly, Wallet), and possibly the PMX expenditure balance type (see *Balance Types*). The operator configures which expenditure plan contains which expenditure balance types.

The screenshot shows the 'Rating Management' application window. At the top, there is a 'Service Provider' dropdown menu set to 'Boss' and a 'Help' button. Below this is a navigation pane with several tabs: 'Named Event', 'Discount Periods', 'Charge Periods', 'Balance Type Cascades', 'Tariff Plan', 'Tariff Plan Selector', 'Rate Tables', 'Discount Sets', 'CLI-DN', 'Weekly', 'Holiday', 'Named Event Catalogue', 'Low Credit Notification Config', 'Tax Plan', 'Expenditure Plan', 'Cross Balance Type Cascades', and 'Reservation Config'. The 'Expenditure Plan' tab is currently selected. The main area displays a table with the following data:

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Expenditure SMS-MO International	SMF	2010-03-22 08:53:38
Expenditure SMS-MO Off-net	SMF	2010-03-22 08:53:26
Expenditure SMS-MO On-net	SMF	2010-03-22 08:53:23

At the bottom of the window, there are four buttons: 'New', 'Edit', 'Delete', and 'Close'.



## Expenditure tracking

### Voice

For voice, the expenditure plans are assigned to the CLI-DN pairs to enable expenditure tracking. The operator configures which tariff plans use the functionality.

**Example:** Rating Management screen, CLI-DN tab, **Edit**.

The screenshot shows the 'Edit CLI-DN Tariff' window with the following configuration details:

- Rate Table:** Bronze HPLMN MO
- ChargingMax Geography Set:**
  - Fixed
  - Free
  - International
  - Off-net
  - On-net
  - Premium
- CLI:** On-net (Set, Clear)
- DN:** On-net (Set, Clear)
- Free Call Disposition:** Ignore
- Expenditure Plan:** Expenditure HPLMN-MO On-net (highlighted with a red box)
- Maximum Charge (\$):** [Empty]
- Cross Balance Type Cascade:** Heavy User - Bronze
- Minimum Length (secs):** 60
- Tariff Code:** None
- Low Credit Notification Config:** -- No Notifications --
- Tax Plan:** None
- Charge On Reservation Timeout:**
- Mid-call Tariff Change:**
- Reservation Config:** - None -
- Billing Resolution (secs):** 1.00
- Balance Type Cascade:** PromoVoice
- Charge Period:** HPLMN-MO-ON-ON
- Discount Set:** No discounts
- Service Id:** [Empty]
- Master Discount:**
- Buttons:** Save, Cancel, More

### SMS

For SMS, the expenditure plans are assigned to the named events to enable expenditure tracking. The operator configures which named events use the functionality.

**Example:** Rating Management screen, **Named Events** tab, **Edit**.

### Reward promotions

The following reward promotions are used by the LO service.

Name	Usage
Loyalty Reward Bronze	LO reward, assigning LO points, for Bronze subscribers.
Loyalty Reward Silver	LO reward, assigning LO points, for Silver subscribers.
Loyalty Reward Gold	LO reward, assigning LO points, for Gold subscribers.

### Recharge types

The following recharge types (RT), also known as LO service bundles, are used by the LO service.

Field	Usage
LO 1 Bronze	Available for purchase (LO IVR) for Bronze subscribers.
LO 2 Bronze	Available for purchase (LO IVR) for Bronze subscribers.
LO 3 Bronze	Available for purchase (LO IVR) for Bronze subscribers.

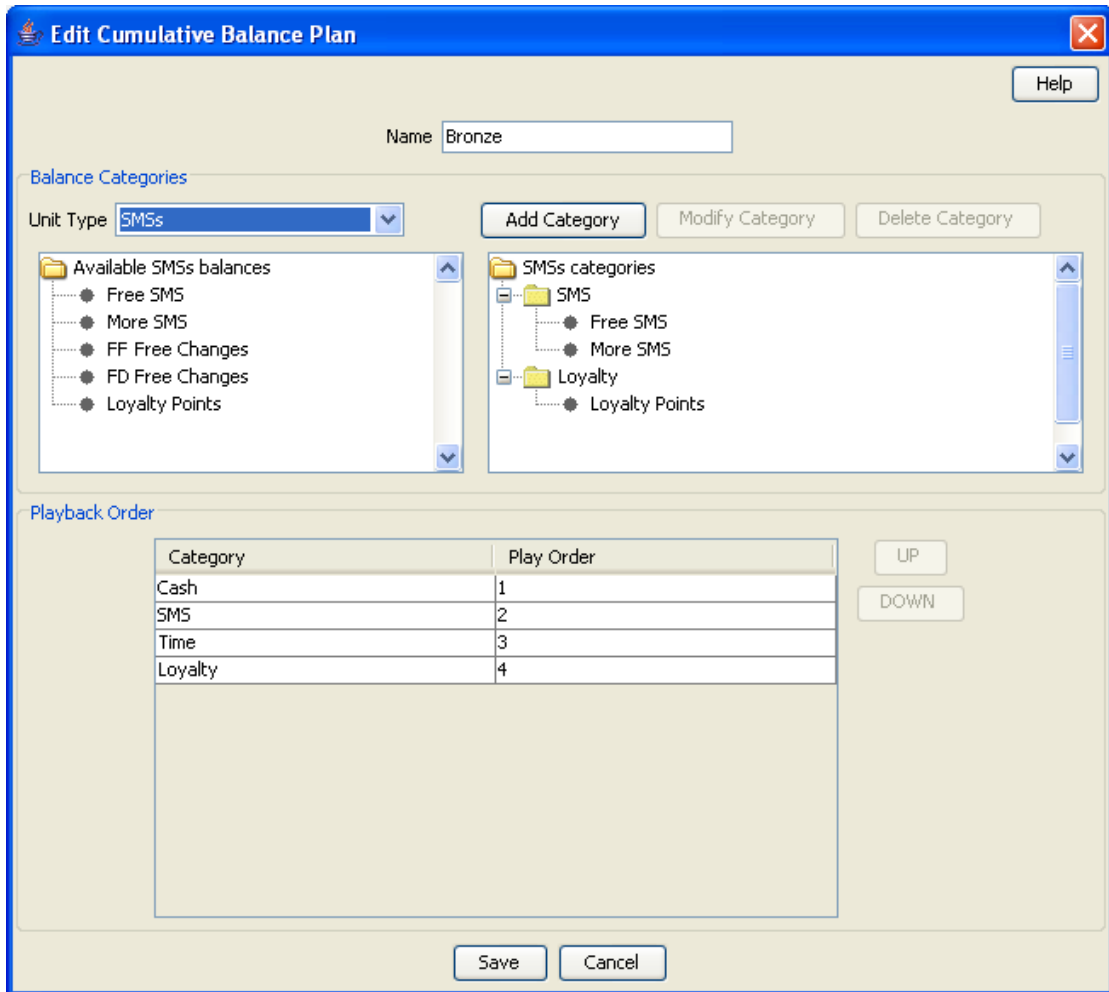
Field	Usage
LO 4 Bronze	Available for purchase (LO IVR) for Bronze subscribers.
LO 5 Bronze	Available for purchase (LO IVR) for Bronze subscribers.
LO 1 Silver	Available for purchase (LO IVR) for Silver subscribers.
LO 2 Silver	Available for purchase (LO IVR) for Silver subscribers.
LO 3 Silver	Available for purchase (LO IVR) for Silver subscribers.
LO 4 Silver	Available for purchase (LO IVR) for Silver subscribers.
LO 5 Silver	Available for purchase (LO IVR) for Silver subscribers.
LO 1 Gold	Available for purchase (LO IVR) for Gold subscribers.
LO 2 Gold	Available for purchase (LO IVR) for Gold subscribers.
LO 3 Gold	Available for purchase (LO IVR) for Gold subscribers.
LO 4 Gold	Available for purchase (LO IVR) for Gold subscribers.
LO 5 Gold	Available for purchase (LO IVR) for Gold subscribers.

### Cumulative Balances

The LO service sets up a cumulative balances plan for SMSs, which includes the “Loyalty Points” balance type, for use in the LO IVR service logic.

Here is an example screen.

Wallet Management screen, **Cumulative Balance Plans** tab, **Edit**.



## Screens

The LO service uses two SPM custom screens:

- Product Type
- Subscriber



## Product Type screen

Here is an example screen.

The screenshot shows the 'Edit Product Type' window. The left sidebar contains a tree view with the following items:

- Bypass numbers
  - Creditcard Recharge Rules
  - Second Currency
  - What's New
  - Help & Info
  - Product Type Swaps
  - Node Options
  - Activation Credits
  - Remote Access
  - Friends and Destination
  - Friends and Family
  - Promotional Destination Rates
  - Cumulative Balances
  - Real-Time Wallet Notifications
  - Periodic Charges
  - Adjustments
  - Wallet Life Cycle
- Subscriber Profile Limitations
- Profile
  - Friends & Family Config
  - Favourite Destination Config
  - Balance Dependant Rating Co
  - Closed User Group Config
  - Community Services Config
  - Overdraft Config
  - Home Zone Config
  - Heavy User Config
  - Booster 1 Config
  - Booster 2 Config
  - Booster 3 Config
  - Booster 4 Config
  - Booster 5 Config
  - Happy Birthday Config
  - Happy Anniversary Config
  - Peer to Peer Config
  - Service Bundles Config
  - Loyalty Service Config

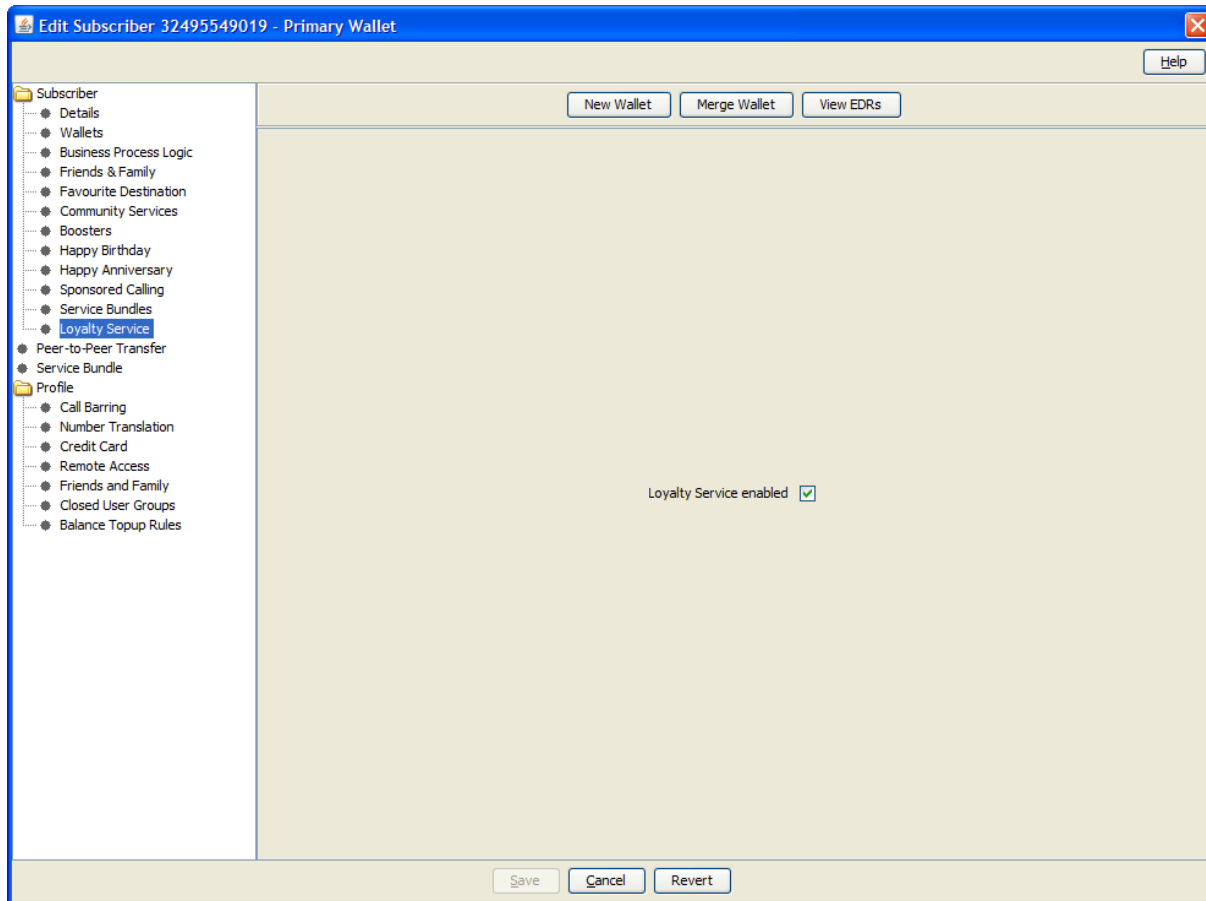
The main area on the right contains five input fields:

Price of Loyalty Reward 1 (hex)	<input type="text" value="10"/>
Price of Loyalty Reward 2 (hex)	<input type="text" value="20"/>
Price of Loyalty Reward 3 (hex)	<input type="text" value="30"/>
Price of Loyalty Reward 4 (hex)	<input type="text" value="40"/>
Price of Loyalty Reward 5 (hex)	<input type="text" value="50"/>

At the bottom of the window are 'Save' and 'Cancel' buttons.

### Subscriber screens

Here is an example screen.



### Screens Template access

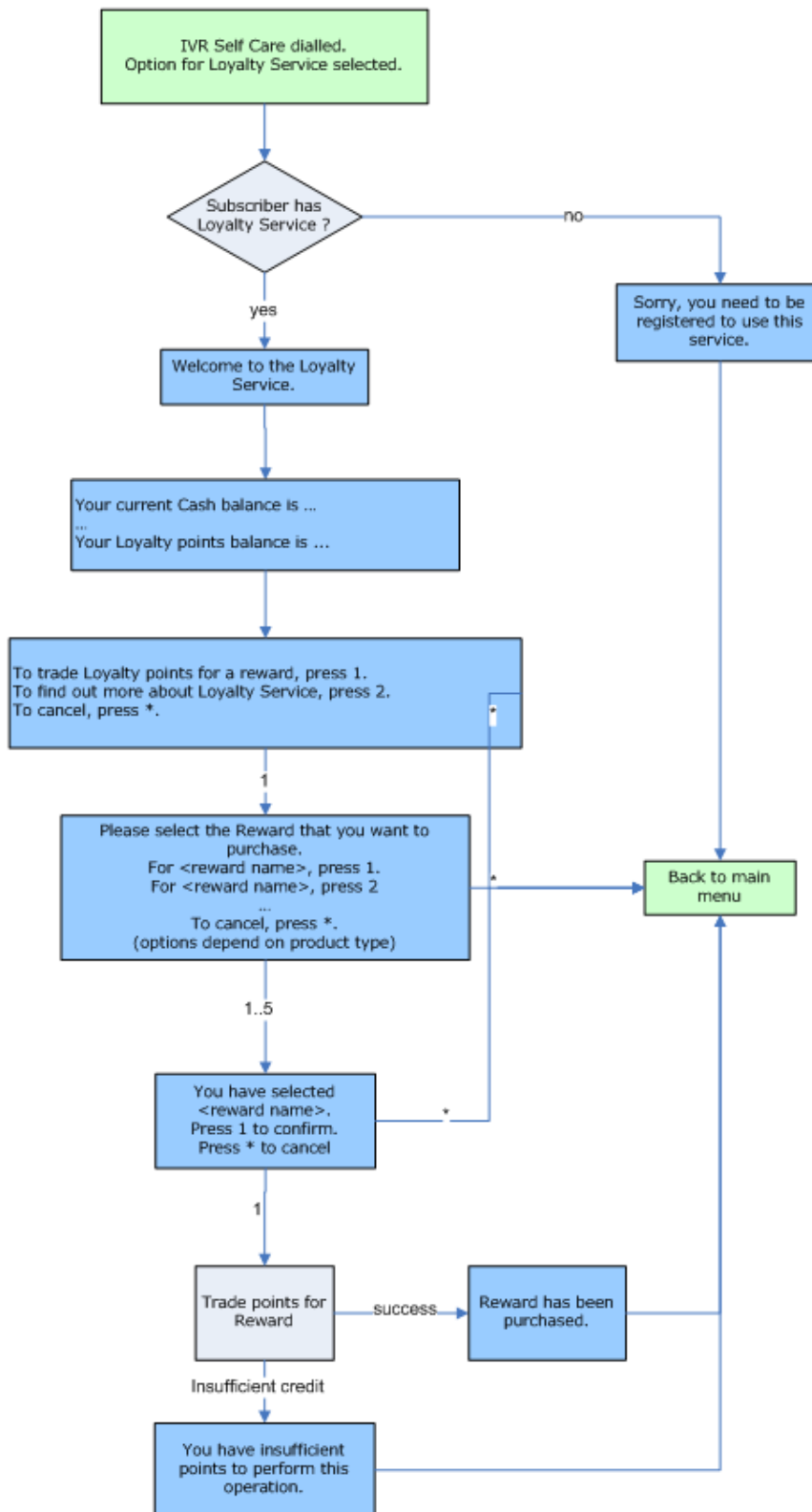
A standard NCC installation creates access rights for the custom LO screens, for the following users:

- "CSR"
- "Operator"
- "Administrator"

### Flow charts

The flow chart below provides more information on how the LO service functions for the different call scenarios.

## Loyalty Service Self Care Convert Points



# IVR Self Care

## About IVR self care

In a GSM network you access the self care feature of PCST through a CS1 compatible IVR that is integrated with the SLC nodes (either by using a direct M3UA connection, or by using signaling gateways).

You access the IVR by dialing a specific number or short code to trigger a dedicated IVR self care control plan. From this control plan, you can perform a number of self care tasks.

## Self care main menu

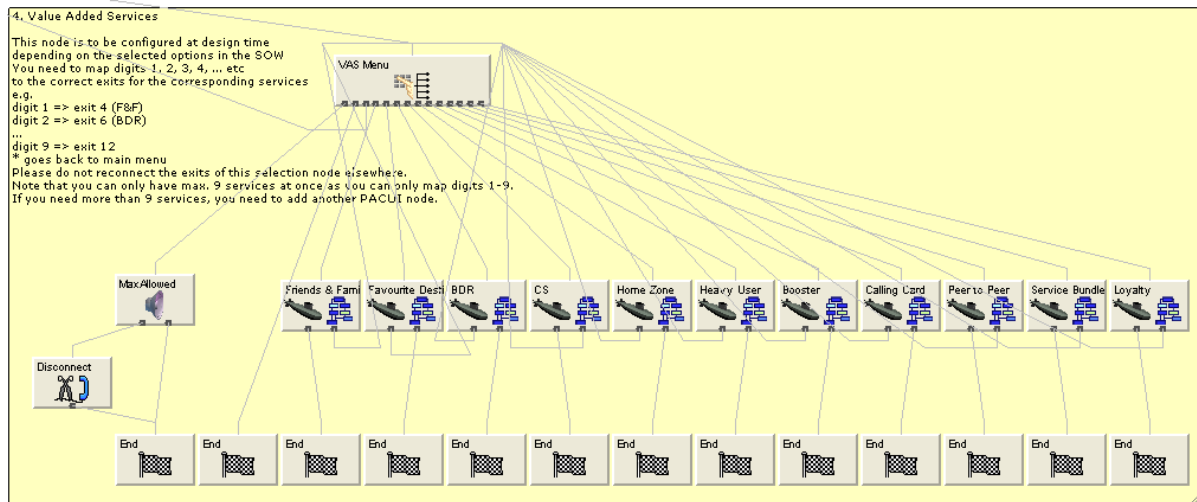
The Self Care Main Menu provides a single entry point for the IVR self care. The menu provides an overview of the available self care features and allows navigation to sub-menus for the individual self care features.

This table lists the available options.

Option	Option Name	Description
1	Language Selection	To choose the language that you want to hear announcements played in.
2	Balance Status	Provides information on balance status and account status.
3	Voucher Recharge	Enables you to recharge your account.
4	Service Management	Enables you to select from a list of value added services.

## VAS menu

The main IVR Self Care service logic (option 4) calls all Value Added Services (VAS) specific IVR Self Care service logic as individual sub-control plans, as shown below.



## IVR value added services

This table lists the services that are available to you when you choose the Service Management option from the IVR Self Care main menu. It also lists the control plan that is triggered for each service.

IVR Option	IVR Control Plan	Refer to
Friends and Family	FF IVR - SCP	<i>Favourite Destination</i> (on page 91)
Favourite Destination	FD IVR - SCP	<i>Favourite Destination</i> (on page 91)
Balance Dependant Rating	BDR IVR - SCP	<i>Balance Dependant Rating</i> (on page 106)
Community Services	CS IVR - SCP	<i>Home Zone</i> (on page 140)
Home Zone	HZ IVR - SCP	<i>Home Zone</i> (on page 140)
Heavy User	HU IVR - SCP	<i>Heavy User</i> (on page 146)
Booster	BO IVR - SCP	<i>Boosters</i> (on page 153)
Calling Card	CC IVR - SCP	<i>Calling Card</i> (on page 184)
Peer to Peer	P2P IVR - SCP	<i>Peer to Peer Transfer</i> (on page 193)
Service Bundle	SB IVR - SCP	<i>Service Bundles</i> (on page 200)
Loyalty	LO IVR - SCP	<i>Loyalty Scheme</i> (on page 217)



# Integration with ECE

## Overview

### Introduction

This chapter explains how to configure Oracle Communications Network Charging and Control (NCC) to integrate with Elastic Charging Engine (ECE).

### In this chapter

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This chapter contains the following topics.

Control Plan Configuration .....	233
About NCC Balance-Type Configuration.....	235
About DCD AVP Configuration.....	241

## Control Plan Configuration

When NCC is integrated with ECE, NCC forwards calls for external subscribers to ECE. To enable NCC to process calls for external subscribers successfully, you add the following feature nodes to the beginning of each control plan that will be invoked by ECE subscribers:

- Add the Set Active Domain feature node after the Start feature node in the control plan. You use the Set Active Domain feature node to set the active domain to the ECE domain.
- Add two Set feature nodes after the Set Active Domain feature node. You use the Set feature nodes to populate the Service-Identifier and Rating Group values that are sent in request messages.

### Configuring the Set Active Domain Feature Node

To configure a Set Active Domain feature node:

Step	Action
1	In the Control Plan Editor window, open the control plan you want to edit.
2	Add a Set Active Domain feature node to the control plan immediately after the Start feature node.
3	Open the configuration window for the Set Active Domain feature node.
4	In the <b>Name</b> field, select the name of the ECE domain; for example, select <code>ECE_Domain</code> . This will set the active domain to the ECE domain.
5	In the Management area, select the <b>Wallet</b> option. Ensure that all other Management options are deselected.
6	Click <b>Save</b> .
7	Save and close the control plan.

## Configuring the ECE Service Identifier and Rating Group

You add two Set feature nodes to control plans to set the Diameter Service Identifier and Diameter Rating Group profile tags to the values that ECE will use to direct calls to the correct service.

You must configure values that match the corresponding values configured in ECE for the service required; for example, if ECE includes the following service configuration in the ECE Diameter Mediation table:

```
Service-Context-Id | Service-Identifier | Rating-Group | ProductType | EventType
Version | ValidFrom |
"32260@3gpp.org" | "1" | "10" | "TelcoGsmTelephony" | "EventSessionTelcoGsm" | 1.0 |
"2012-12-31T12:01:01" | ***** Account Level *****
```

you would configure Set feature nodes for the service "TelcoGsmTelephony" to set:

- The Diameter Service Identifier profile tag to 1
- The Diameter Rating Group profile tag to 10

To configure the ECE service identifier and rating group:

Step	Action
1	In the Control Plan Editor window, open the control plan you want to edit.
2	Add a Set feature node to the beginning of the control plan, immediately after the Set Active Domain feature node.
3	Open the configuration window for the Set feature node.
4	Set the Diameter Service Identifier profile tag to the ECE service identifier value by doing the following: <ol style="list-style-type: none"> <li>In the <b>Value</b> field, enter the ECE service identifier value.</li> <li>From the <b>Target Data Type</b> list, select <code>Temporary Storage</code>.</li> <li>From the <b>Target Location</b> list, select <code>Temporary Storage</code>.</li> <li>From the <b>Target Field</b> list, select <code>Diameter Service Identifier</code>.</li> </ol>
5	Click <b>Save</b> .
6	Add a second Set feature node immediately after the first Set feature node.
7	Open the configuration window for the second Set feature node.
8	Set the Diameter Rating Group profile tag to the ECE rating group value by doing the following: <ol style="list-style-type: none"> <li>In the <b>Value</b> field, enter the ECE rating group value.</li> <li>From the <b>Target Data Type</b> list, select <code>Temporary Storage</code>.</li> <li>From the <b>Target Location</b> list, select <code>Temporary Storage</code>.</li> <li>From the <b>Target Field</b> list, select <code>Diameter Rating Group</code>.</li> </ol>
9	Click <b>Save</b> .
10	Save and close the control plan.

## About Variable Amount Recharge Feature Node Configuration

You use the Variable Amount Recharge feature node to send voucher recharge details to ECE, such as the balance to recharge and the recharge amount. When you configure the Variable Amount Recharge feature node, ignore the wallet-type fields that can be used to set the NCC wallet type.

If you specify configuration in the wallet-type fields, NCC includes a `setWallet` request in the recharge message sent to ECE. Because the `setWallet` request is not supported by Diameter, this will result in calls failing.



## About CCS Capabilities

CCS capabilities enable calls sent to the same service key to be handled differently depending on the bearer capability in their IDP. For example, voice and video for same service key can have different control plans.

A capability definition includes the default control plan for the capability. You must set the default control plan that will be invoked for external subscribers for each CCS capability. You set the default control plan for a CCS capability in the Prepaid Charging, Service Management window in the NCC UI. See the discussion of CCS capability configuration in *CCS User's Guide* for more information.

## About NCC Balance-Type Configuration

This section describes the updates required to NCC balance-type configuration to enable NCC to send balances to, and receive balances from ECE. This section assumes that the balance types that will be used are already configured in the NCC UI.

See *CCS User's Guide* for information about configuring balance types in NCC.

### Enabling Balance Values to Pass Between NCC and ECE

Perform the following updates to balance-type configurations in NCC to enable balance values to pass between NCC and ECE:

- Update the balance-type configuration in the `ccsMacroNodes` section of the `eserv.config` file. See *Balance-Type Configuration in eserv.config* (on page 235).
- Update the subscriber-domain-type configuration in the `eserv.config` file. See *Subscriber-Domain-Type Configuration in eserv.config* (on page 237).
- Update the DCD-balance-query configuration in the `eserv.config` file. See *Balance-Query Configuration in eserv.config* (on page 237).
- Configure balance-type mapping between NCC and ECE. See *Configuring Balance-Type Mapping Between NCC and ECE* (on page 237).
- Configure balance-type announcements. See *Configuring Balance-Type Announcements* (on page 238).
- Configure balance-type translations for balance notifications. See *Configuring Balance-Type Translations for Balance Notifications* (on page 239).
- Enable first-use policies for vouchers. See *Enabling First-Use Balance-Expiry Policies in NCC* (on page 241).

### Balance-Type Configuration in `eserv.config`

You use the following feature nodes in control plans to play balance announcements to subscribers:

- Account Status
- Balance Status
- Balance State Branch

To configure which balance types to check for a specified service provider before playing balance announcements, include the following configuration in the `CCS`, `ccsMacroNodes` section of the `eserv.config` file:

```
CCS = {
    ccsMacroNodes = {
        BSAnnBalanceTypes = [
```

```

        {
            acsCustomerId = customer_id
            balTypeIds = [ balance_ids]
        }
    ]

    BSBCheckBalanceTypes = [
        {
            acsCustomerId = customer_id
            balTypeIds = [ balance_ids]
        }
    ]
}

```

where:

- **BSAnnBalanceTypes** defines the list of service providers and balance types for which announcements can be played by the Account Status and Balance Status feature nodes.
- **BSBCheckBalanceTypes** defines the list of service providers and balance types for which announcements can be played by the Balance State Branch feature node.
- *customer\_id* is the ID in the ACS\_CUSTOMER database table of the service provider. Specify the ID for the service provider you are using for the external subscribers.
- *balance\_ids* is the ID in the CCS\_BALANCE\_TYPE database table of the balance type that will be checked for the service provider specified in *acsCustomerId*. To check multiple IDs, use a comma as a separator. For example: *balTypeIds* = [15, 16]

To specify configuration for multiple service providers, for each additional service provider configure the *acsCustomerId* and *balTypeIds* parameters; for example the following configuration is for two service providers:

```

CCS = {
    ccsMacroNodes = {
        BSAnnBalanceTypes = [
            {
                acsCustomerId = customer_id_1
                balTypeIds = [ balance_ids]
            }
            {
                acsCustomerId = customer_id_2
                balTypeIds = [ balance_ids]
            }
        ]

        BSBCheckBalanceTypes = [
            {
                acsCustomerId = customer_id_1
                balTypeIds = [ balance_ids]
            }
            {
                acsCustomerId = customer_id_2
                balTypeIds = [ balance_ids]
            }
        ]
    }
}

```

## Subscriber-Domain-Type Configuration in `eserv.config`

To enable the Balance State Branch feature node to work correctly without the need for an additional Set Active Domain feature node in the control plan, include the following configuration in the CCS, `ccsServiceLibrary` section of the `eserv.config` file on the SLC node:

```
CCS = {
  ccsServiceLibrary = {
    SubscriberDomainType = 1
  }
}
```

where the `SubscriberDomainType` parameter value is the ID of the VWS domain set in the `DOMAIN_TYPE_ID` field in the `CCS_DOMAIN` database table. The default value for the VWS domain ID is 1 (one).

## Balance-Query Configuration in `eserv.config`

DCD supports `BALANCE_ENQUIRY` Diameter message requests. You must configure DCD to send `BALANCE_ENQUIRY` Diameter message requests using the `balance-check` method. The `balance-check` method triggers balance queries based on a `balance-check` message with a service identifier that is set to "Information".

Configure the `balance-check` method in DCD by including the following configuration in the `DomainTypes` section of the `eserv.config` file on the SLC node:

```
DomainTypes = [
  { balanceEnquiryMethod = "balanceCheck" }
]
```

See *DCD Technical Guide* for more information about DCD configuration.

## Configuring Balance-Type Mapping Between NCC and ECE

NCC and ECE store balances in their systems with different balance types and currency units. To send and receive balances between each product, map NCC balance types to their equivalent ECE balance IDs. For example, map the NCC balance type for currency balances to its equivalent ECE balance ID, 840.

You map a NCC balance type to an ECE balance ID by specifying:

- The NCC balance type name

The equivalent ECE balance ID

- The Diameter domain
- The conversion scale

The conversion scale is a number that converts balance values between Convergent Charging Controller and ECE. For example, if ECE stores 1 British pound as 1.0 and Convergent Charging Controller stores 1 British pound as 100 (1 British pound equals 100 pence), the conversion scale must be set to 100 to multiply the incoming ECE British pounds value to the Convergent Charging Controller pounds value, denominated in pence.

To configure a balance-type mapping between NCC and ECE:

Step	Action
1	Log in to the SMS UI.

Step	Action
2	From the <b>Services</b> menu, select <b>Prepaid Charging &gt; Service Management</b> . The Service Management screen is displayed.
3	From the <b>Service Provider</b> list, select the service provider you are using for external subscribers.
4	Click the <b>Balance Type Mapping</b> tab.
5	Click <b>New</b> . The New Balance Type Mapping dialog box is displayed.
6	From the <b>Balance Type</b> list, select name of the NCC balance type.
7	In the <b>Third-Party Resource</b> field, enter the equivalent ECE balance ID.
8	In the <b>Third-Party Resource Scale</b> field, enter the conversion scale to apply between NCC and ECE balances.  For example, to convert NCC dollar balances held in cents to ECE dollar balances held in dollars, set this field to 100. In this case, NCC balances are divided by 100 before they are sent to ECE. That is, an NCC balance of 500 cents is divided by 100 to convert it into an ECE balance of 5 dollars.
9	From the <b>Domain Type</b> list, select the Diameter domain.
10	Click <b>Save</b> .
11	Open the <b>eserv.config</b> file in a text editor.
12	In the <b>DCD</b> section, set the <code>conversionScale</code> parameter to 0: <pre>DIAMETER = {     DomainTypes = [         AVPs = [             {                 conversionScale = 0             }         ]     ] }</pre> <p>This configures DCD to use the conversion scale specified in the <b>Balance Type Mapping</b> tab on appropriate balance-type AVPs.</p>
13	Save and close the file.

See the discussion about service management in *CCS User's Guide* for more information.

## Configuring Balance-Type Announcements

To configure which announcements to play to subscribers for balance expiries:

**Note:** This procedure assumes that ACS announcements are already configured. See the discussion of configuring announcements in *ACS User's Guide* for more information about configuring announcements in ACS.

Step	Action
1	In the SMS UI, open the Prepaid Charging, Wallet Management window.
2	From the <b>Service Provider</b> list, select the service provider you are using for external subscribers.
3	Click the <b>Balance Type</b> tab.
4	From the list of balance types on the tab, select the balance type for which you want to configure announcements.
5	Click <b>Edit</b> . The Edit Balance Type screen appears.

Step	Action
6	In the Edit Balance Type screen, select the <b>Balance Type Announcements</b> tab.
7	From the available announcement lists, select the announcements to play subscribers for balance expiries. For each type of announcement, do the following: <ol style="list-style-type: none"> <li>From the <b>Announcement Set</b> list, select the announcement set that holds the announcement you want to play.</li> <li>From the <b>Announcement</b> list, select the announcement to play.</li> </ol>
8	Currency-to-announcement mappings define, for cash balance types only, the announcements to play when the subscriber's balance is positive or negative and the currencies in which the announcements can be played.  If this is a cash balance, add or edit currency mappings as required. See the discussion of balance-type-announcement configuration in <i>CCS User's Guide</i> for more information.
9	Click <b>Save</b> . The balance-type-announcement configuration is saved to the database.

## Configuring Balance-Type Translations for Balance Notifications

You configure NCC to send balance-type notifications in the subscriber's language and currency by configuring balance-type translations for the balance information contained in notifications.

To configure a balance-type translation for a balance notification:

Step	Action
1	In the SMS UI, open the Prepaid Charging, Wallet Management window.
2	From the <b>Service Provider</b> list, select the service provider you are using for external subscribers.
3	Select the <b>Balance Type Translations</b> tab.
4	If you want to: <ul style="list-style-type: none"> <li>Add a balance-type translation, click <b>New</b>. The New Balance Type Translation dialog box appears.</li> <li>Edit a balance-type translation, select the balance-type translation on the tab and click <b>Edit</b>. The Edit Balance Type Translation dialog box appears.</li> </ul>
5	Configure the balance-type translation by specifying values in the available fields. See <i>Balance Type Translations Fields</i> (on page 239) for information about the available fields.
6	Click <b>Save</b> .

## Balance Type Translations Fields

This table describes the balance-type translation fields.

Field	Description
Language	The language the short message is being translated to. This field cannot be changed after the record is first saved. This list is populated by the <b>Language</b> tab on the ACS Tools screen. For more information about configuring languages, see <i>ACS User's Guide</i> .

Field	Description																							
Balance Type	<p>The balance type this translation will be for. This list is populated by the records configured in the <b>Balance Types</b> tab.</p> <p>This field cannot be changed after the record is first saved.</p> <p><b>Tip:</b> You can create only one balance-type translation for each language and balance-type combination.</p>																							
Single Balance Currency Type	<p>If required, you can select a different single balance currency type to use for the balance type.</p> <p><b>Note:</b> This field is available only if the <b>Balance Type</b> field is set to a balance type that has a unit of cash.</p>																							
Dual Balance Currency Type	<p>If required, you can select a different dual-balance currency type to use for the balance type.</p> <p><b>Note:</b> This field is available only if the <b>Balance Type</b> field is set to a balance type that has a unit of cash.</p>																							
Translated Name	<p>The translated balance-type name to send to the subscriber in short messages. If nothing is entered in this field, this part of the message will not be sent.</p> <p><b>Tip:</b> The maximum number of characters allowed is 20.</p>																							
Single Format for Balance	<p>The structure of the data to send to the subscriber in short messages for a single (or first) currency.</p> <ul style="list-style-type: none"> <li>For balance types with a cash unit, the structure of the data to send to the subscriber in short messages when the balance is in one currency. The subscriber's actual details are inserted into the variables. The variables must include the following, in order:  <pre>%s %d %c %02d</pre> <p>Where:</p> <table border="1"> <thead> <tr> <th>Variable</th> <th>Replaced by...</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>%s</td> <td>Currency Code</td> <td>AUD</td> </tr> <tr> <td>%d</td> <td>Main unit of the currency</td> <td>\$</td> </tr> <tr> <td>%c</td> <td>Separator</td> <td>.</td> </tr> <tr> <td>%02d</td> <td>Subunit of the currency</td> <td>c</td> </tr> </tbody> </table> </li> <li>For balance types with non-cash units (for example, time balances are in seconds), you may only include the %d variable in the text in the <b>Single Format for Balance</b> field. <table border="1"> <thead> <tr> <th>For balance type unit</th> <th>%d variable is replaced by</th> </tr> </thead> <tbody> <tr> <td>Time</td> <td>Time balance in seconds</td> </tr> <tr> <td>SMS</td> <td>Number of named events</td> </tr> <tr> <td>Bad PIN</td> <td>Number of bad PIN attempts during the last 24 hours.</td> </tr> </tbody> </table> </li> </ul>	Variable	Replaced by...	Example	%s	Currency Code	AUD	%d	Main unit of the currency	\$	%c	Separator	.	%02d	Subunit of the currency	c	For balance type unit	%d variable is replaced by	Time	Time balance in seconds	SMS	Number of named events	Bad PIN	Number of bad PIN attempts during the last 24 hours.
Variable	Replaced by...	Example																						
%s	Currency Code	AUD																						
%d	Main unit of the currency	\$																						
%c	Separator	.																						
%02d	Subunit of the currency	c																						
For balance type unit	%d variable is replaced by																							
Time	Time balance in seconds																							
SMS	Number of named events																							
Bad PIN	Number of bad PIN attempts during the last 24 hours.																							
Dual Format for Balance	<p>The structure of the data to send to the subscriber in short messages for the second currency.</p> <p><b>Note:</b> This field is not available for non-cash balance types or balance types</p>																							

Field	Description
	that have only one currency.
Separator	The character to use to separate the different balances when put together in an SMS Notification. <b>Example:</b> If you enter a comma (,) and there are two balances, General Cash and Promotional Cash, the short message sent in response to a balance inquiry looks like this: General Cash balance \$20.00 , Promotional Cash balance \$10.00 .
Balance Expiry	The balance-expiry text. <b>Warning:</b> You must include '%d' in the text. This variable will be converted to the number of days remaining until the balance expires.
No Balance Expiry	The text to output for balances that have no expiry date.

## Enabling First-Use Balance-Expiry Policies in NCC

A first-use balance is a balance for a subscriber in which the balance-expiry date is offset from the date and time that the balance is first used. NCC supports the following first-use balance-expiry policy options for voucher types:

- First Use With Offset. The expiry date is based on the expiry offset value specified in the voucher-type configuration.
- First Use – Account Cycle. The expiry date is based on the ECE Account Cycle value.
- First Use – Bill Cycle. The expiry date is based on the ECE Billing Cycle value.

For each of these options, the balance start date and time is set to the date and time that the balance is first used. DCD passes the first-use values to ECE in the ORA-First-Usage-Validity AVP.

You specify the first-use balance-expiry policy for a voucher type in the multi-balance configuration in the New Voucher Type and Edit Voucher Type windows in the NCC UI.

First-use expiry policy options are disabled in the NCC UI by default. To enable first-use expiry policy options, you set the `jnlp.ECEExtensions` Java application property to true in the `sms.jnlp` file:

```
<property name="jnlp.ECEExtensions" value="true" />
```

## About DCD AVP Configuration

This section describes the changes to make to DCD AVP configuration to enable NCC to integrate with ECE. You configure DCD AVPs in the DCD, DomainTypes, and AVPs section of the `eserv.config` file on SLC nodes. See the discussion about AVP configuration in *DCD Technical Guide* for more information.

### Configuring DCD AVPs to Integrate NCC with ECE

Perform the following updates to DCD AVP configuration:

- Configure sign inversion for AVPs of type Integer32 or Integer64. See *About Sign Inversion* (on page 242).
- Configure DCD to exclude ORA-Validity-End-Relative AVPs with the value 0 (zero). See *Excluding AVPs with Zero Values in Message Requests* (on page 242).
- Configure Currency-Code AVPs to set the system and user currencies that will be used for playing announcements. See *Currency Code Configuration for Playing Announcements* (on page 243).

- Configure mapping between NCC voucher expiry periods and ECE expiry periods. See *Mapping NCC Voucher-Expiry Periods to ECE Values* (on page 243).
- Configure ORA-Account-Topup AVPs to top up multiple balances. See *Voucher Top-Up Configuration for Multiple Balance Types* (on page 244).
- Configure ORA-Balance AVPs to handle balance queries that return multiple balances in request messages. See *Balance Query Response Configuration for Multiple Balances* (on page 245).
- Configure AVPs to prevent balance queries from returning invalid values. See *Preventing Balance Queries from Returning Invalid Values* (on page 245).
- Configure ORA-First-Usage-Validity AVPs. See *Configuring AVPs to Support First Use* (on page 245).
- Configure the ORA-Extend-Bucket-Validity AVP to send the correct new bucket information to ECE. See *New Bucket AVP Configuration* (on page 246).

## About Sign Inversion

For pre-paid services, NCC and ECE store balance values from different perspectives; positive balance values in NCC are stored as negative balance values in ECE and negative balance values in NCC are stored as positive balance values in ECE.

To configure NCC to convert positive integer values to negative values (and vice versa) for both inbound and outbound values, you set the `signInversion` parameter to `true` in the DCD AVP configuration in the `eserv.config` file.

When `signInversion` is set to `true` for an AVP of type `Integer32` or `Integer64`:

- An outbound positive DCD concept value is converted to a negative value in the AVP.
- An outbound negative DCD concept value is converted to a positive value in the AVP.
- An inbound positive AVP value is converted to a negative DCD concept value.
- An inbound negative AVP value is converted to a positive DCD concept value.

For example, you configure sign inversion in the Value-Digits AVP as follows:

```
{
  name = "Value-Digits"
  avpCode = 12003
  ccsConcept = "voucherInfoValue"
  type = "Integer32"
  signInversion = true
  conversionScale = 0
}
```

## Excluding AVPs with Zero Values in Message Requests

DCD can send the ORA-Validity-End-Relative AVP in outgoing message requests to ECE for vouchers with multiple balance entries. If a balance-expiry-period value is 0 (zero) — for example, if the expiry value has not been changed from the default value — the message request sent to ECE will fail.

To exclude ORA-Validity-End-Relative AVPs with the value 0 in message requests, set the `excludeWhenIn` parameter to 0 in the DCD AVP configuration:

```
{
  avpCode = 218
  name = "ORA-Validity-Offset-End-Relative"
  ccsConcept = "voucherInfoBalanceExpiryExtension"
  type = "Unsigned32"
  excludeWhenIn = "0"
}
```



where the `excludeWhenIn` parameter specifies to exclude the ORA-Validity-Offset-End-Relative AVP from the DCD outgoing message when the value for the specified CCS concept is 0.

## Currency Code Configuration for Playing Announcements

NCC feature nodes that play announcements, such as the Account Status feature node, derive the announcement to play using the system and user currency values stored in the `walletInfoSystemCurrency` and `walletInfoUserCurrency` CCS concepts. Because ECE does not return the currency code in CCA response messages, values for these CCS concepts are not populated by default and therefore the announcements cannot be played.

To enable NCC feature nodes to play announcements following a CCA response message, you set the currency code for the system and user currencies to a specific value by adding the following AVP configuration for each type of CCA response message:

- 1 Add the Currency-Code AVP to the ORA-Balance-Element AVP for the CCA response message.
- 2 Configure the Currency-Code AVP to set the values for the `walletInfoSystemCurrency` and `walletInfoUserCurrency` CCS concepts to a specific currency.

The following example configuration shows the configuration for the ORA-Balance-Element AVP for balance top-ups. The Currency-Code-Topup AVP has been added to the list of mandatory contents, and its value has been set to 1 (one) in the Currency-Code-Topup AVP. This sets the system and user currency for balance top-ups to euros.

```
{
  avpCode = 243
  name = "ORA-Balance-Element"
  type = "Grouped"
  mandatoryContents = [
    "ORA-Balance-Element-Id"
    # "ORA-Balance-Item" # Not currently supported in NCC ccsConcepts
    "Unit-Value"
    "Currency-Code-Topup"
  ]
}
{
  avpCode = 425
  name = "Currency-Code-Topup"
  ccsConcept = "walletInfoUserCurrency,walletInfoSystemCurrency"
  type = "Unsigned32"
  value = "1" # set User & System Currency to allow announcements to be
  played for topups
}
```

## Mapping NCC Voucher-Expiry Periods to ECE Values

NCC and ECE use different values for voucher-expiry-period units. You configure how to map NCC expiry units to ECE expiry units in ORA-Validity-Unit AVPs:

```
{
  avpCode = 219
  name = "ORA-Validity-Unit"
  ccsConcept = "voucherConcept"
  type = "Enumerated"
  conversion = [
    {
      esg = NCC_unit
      vendor = ECE_unit
    }
  ]
}
```

```
    ]
}
```

where:

- *voucherConcept* is the CCS concept for the voucher expiry data that will be mapped, such as the *voucherInfoBalanceExpiryExtensionType* or the *voucherInfoBalanceValidityType*
- *NCC\_unit* is specified in the *esg* parameter and defines the NCC expiry unit type to map; for example, 1 for months, 2 for hours
- *ECE\_unit* is specified in the *vendor* parameter and defines the corresponding ECE expiry unit type; for example, 4 for months, 2 for hours

Specify a combination of the *esg* and *vendor* parameters for each expiry unit type you want to map. For example, the following ORA-Validity-Unit-End-Relative AVP configuration maps the expiry units used in NCC for months and hours to the values used in ECE for months and hours:

```
{
  avpCode = 219
  name = "ORA-Validity-Unit-End-Relative"
  ccsConcept = "voucherInfoBalanceExpiryExtensionType"
  type = "Enumerated"
  conversion = [
    {
      esg = 1          # NCC Expiry Unit Months
      vendor = 4      # ECE Expiry Unit Months
    }
    {
      esg = 0          # NCC Expiry Unit Hours
      vendor = 2      # ECE Expiry Unit Hours
    }
  ]
}
```

## Voucher Top-Up Configuration for Multiple Balance Types

You use the ORA-Account-Topup AVP to top up the balances for a voucher. If you are using voucher types for which multiple balance types have been configured, you can configure the ORA-Account-Topup AVP to top up all the balances at the same time.

To configure the ORA-Account-Topup AVP to apply balance top-ups to multiple balances:

- 1 Add the ORA-Balance AVP to the mandatory contents.
- 2 For each additional balance type, add an ORA-Balance AVP to the optional contents.

For example, the following ORA-Account-Topup AVP shows the configuration required to top up three different balances:

```
{
  avpCode = 206
  name = "ORA-Account-Topup"
  type = "Grouped"
  mandatoryContents = [
    "ORA-Recharge-Reference"
    "ORA-Balance"
  ]
  optionalContents = [
    "ORA-Balance"
    "ORA-Balance"
  ]
}
```

If you do not add the extra optional components, only the first balance is sent in the request message.

## Balance Query Response Configuration for Multiple Balances

The request message for balance queries can return multiple balances. To enable DCD to process additional balances, you set the `repeating` parameter to `true` in the ORA-Balance AVP:

```
{
  avpCode = 208
  name = "ORA-Balance"
  type = "Grouped"
  repeating = true
  mandatoryContents = [
    "ORA-Balance-Element-Id-Topup"
    "Unit-Value-Topup"
    "Service-Identifier"
    "Rating-Group"
  ]
}
```

## Preventing Balance Queries from Returning Invalid Values

To enable the balance values returned in balance-query responses to be processed successfully, remove the Exponent AVP from the ORA-Credit-Floor and ORA-Credit-Ceiling AVPs.

If you include the Exponent AVP in ORA-Credit-Floor and ORA-Credit Ceiling AVPs, Diameter processing returns invalid balance values in balance-query response messages; for example, by creating extra balance types with the ID 0.

## Configuring AVPs to Support First Use

You can configure voucher types to use the following first-use expiry policies:

- First Use With Offset. The expiry date is based on the expiry offset value configured for the voucher type that is stored in the `voucherInfoBalanceExpiryExtensionType` CCS concept
- First Use – Account Cycle. The expiry date is based on the ECE Account Cycle value that is stored in the `voucherInfoBalanceExpiryExtensionPolicy` CCS concept
- First Use – Bill Cycle. The expiry date is based on the ECE Billing Cycle value that is stored in the `voucherInfoBalanceExpiryExtensionPolicy` CCS concept

See *Enabling First-Use Balance-Expiry Policies in NCC* (on page 241) for more information about enabling first-use expiry policies for a voucher type.

To extract the correct first-use values for a voucher and pass them on to ECE, configure the following AVPs:

```
{
  name = "ORA-First-Usage-Validity"
  avpCode = 217
  type = "Grouped"
  excludeWhenEmpty = true
  mandatoryContents = [
  ]
  optionalContents = [
    "ORA-Validity-First-Use-Cycle"
    "ORA-Validity-First-Use-With-Offset"
  ]
}

{
  ## Intentionally blank avpCode
```

```

    name = "ORA-Validity-First-Use-With-Offset"
    mandatoryContents = [
        "ORA-Validity-Offset-First-Use"
        "ORA-Validity-Unit-First-Use"
    ]
}

{
    avpCode = 218
    name = "ORA-Validity-Offset-First-Use"
    ccsConcept = "voucherInfoBalanceFirstUse"
    type = "Unsigned32"
    excludeWhenIn = "0"
}

{
    avpCode = 219
    name = "ORA-Validity-Unit-First-Use"
    ccsConcept = "voucherInfoBalanceExpiryExtensionType"
    type = "Enumerated"
}

{
    ## Intentionally blank avpCode
    name = "ORA-Validity-First-Use-Cycle"
    mandatoryContents = [
        "ORA-Validity-Type-First-Use-Cycle"
    ]
}

{
    avpCode = 219
    name = "ORA-Validity-Type-First-Use-Cycle"
    ccsConcept = "voucherInfoBalanceExpiryExtensionPolicy"
    type = "Enumerated"
    # 6 - firstAccountCycle
    # 7 - firstBillCycle
    includeWhenIn = "6,7"
    conversion = [
        {
            esg = 6      # NCC Expiry Policy - First Use Account Cycle
            vendor = 5  # ECE - First Use Account Cycle
        }
        {
            esg = 7      # NCC Expiry Policy - First Use Bill Cycle
            vendor = 6  # ECE - First Use Bill Cycle
        }
    ]
}
}

```

## New Bucket AVP Configuration

The concept of when a new bucket is created is reversed between NCC and ECE. In NCC, you select whether to create new buckets in the Edit Multi-balance screen for a voucher type. If you selected to create new buckets, NCC sets the voucherInfoNewBucket CCS concept value to 1, otherwise NCC sets the value to 0.

DCD sends the voucherInfoNewBucket value to ECE in ORA-Extend-Bucket-Validity AVPs. Because ECE interprets the value 0 as "create new bucket" and the value 1 as "use existing bucket", you must configure to change the value sent in the AVP to the reversed value:

```

{
    avpCode = 228

```

```

name = "ORA-Extend-Bucket-Validity"
ccsConcept = "voucherInfoNewBucket"
type = "Enumerated"
conversion = [
  {
    esg = 0
    vendor = 1
  }
  {
    esg = 1
    vendor = 0
  }
]
}

```

where:

- The `esg` parameter defines the NCC value; 0 means use existing bucket, 1 means create new bucket
- The `vendor` parameter defines the ECE value; 1 means use existing bucket, 0 means create new bucket

## Sample DCD Configuration File

The `eserv.config.dcd.ece.example` file contains an example DCD configuration for integrating NCC with ECE. It includes the following sections of the `eserv.config` file:

- DCD
- DomainTypes
- Domains
- AVPs

The example configuration file is located in the following directory:

`/IN/service_packages/DCD/etc`

Use the `eserv.config.dcd.ece.example` file for reference when you update DCD configuration in the `eserv.config` file on SLC nodes.



# Glossary of Terms

## AAA

Authentication, Authorization, and Accounting. Specified in Diameter RFC 3588.

## AC

Application Context. A parameter in a TCAP message which indicates what protocol is conveyed. May indicate, for example, MAP, CAMEL, or INAP. Also usually specifies the particular version of the conveyed protocol, for example, which CAMEL Phase.

## ACS

Advanced Control Services configuration platform.

## ANI

Automatic Number Identification - Term used in the USA by long-distance carriers for CLI.

## API

Application Programming Interface

## AVP

Attribute Value Pair, used in Diameter to represent properties of a particular request or answer.

## BCSM

Basic Call State Model - describes the basic processing steps that must be performed by a switch in order to establish and tear down a call.

## C7

See SS7.

## 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.

## CCA

Credit-Control-Answer, used in Diameter by the credit-control server to acknowledge a Credit-Control-Request (CCR) from the credit-control client.

## CCR

Credit-Control-Request, used in Diameter by the credit-control client to request credit authorization from the credit-control server.

## CCS

- 1) Charging Control Services 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).

## CLI

Calling Line Identification - the telephone number of the caller. Also referred to as ANI.

## Connection

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

## Convergent

Also “convergent billing”. Describes the scenario where post-paid and pre-paid calls are handed by the same service platform and the same billing system. Under strict converged billing, post-paid subscribers are essentially treated as “limited credit pre-paid”.

## CPE

Control Plan Editor (previously Call Plan Editor) - software used to define the logic and data associated with a call -for example, "if the subscriber calls 0800 *nnnnn* from a phone at location *xxx* then put the call through to *bb bbb bbbb*".

## cron

Unix utility for scheduling tasks.

## crontab

File used by cron.

## CS1

ETSI INAP Capability Set 1. An ITU standard.

## 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.

## **ETSI**

European Telecommunications Standards Institute

## **FCI**

Furnish Charging Information. An INAP operation sent from ACS to the SSP to control the contents of EDRs produced by the SSP.

## **FDA**

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

## **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.

## **GT**

Global Title.

The GT may be defined in any of the following formats:

- Type 1: String in the form "1,<noa>,<BCD address digits>"
- Type 2: String in the form "2,<trans type><BCD address digits>"
- Type 3: String in the form "3,<trans type>,<num plan>,<BCD address digits>"
- Type 4: String in the form "4,<trans type>,<num plan>,<noa>,<BCD address digits>"

The contents of the Global Title are defined in the Q713 specification, please refer to section 3.4.2.3 for further details on defining Global Title.

## **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

## **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.

## **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.

## **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.

## **MO**

Mobile Originated

## **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

## **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.

## **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.

## **PIN**

Personal Identification Number

## **PL/SQL**

Oracle's Procedural Language for stored procedures and packages.

## **PLMN**

Public Land Mobile Network

## **SCCP**

Signalling Connection Control Part (part of the SS7 protocol stack).

## **SCI**

Send Charging Information. An INAP operation sent from ACS to the SSP to control real time charging by the SSP.

## **SCP**

Service Control Point. Also known as SLC.

## **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.

## **SGSN**

Serving GPRS Support Node

## **SIM**

Usually referred to as a SIM card, the Subscriber Identity Module is the user subscription to the mobile network. The SIM contains relevant information that enables access onto the subscribed operator's network.

## **SK**

Service Key

## **SLC**

Service Logic Controller (formerly UAS).

## **SLEE**

Service Logic Execution Environment

## **SME**

Short Message Entity - This is an entity which may send or receive short messages. It may be located in a fixed network, a mobile, or an SMSC.

## **SMS**

Depending on context, can be:

- Service Management System hardware platform
- Short Message Service
- Service Management System platform
- NCC Service Management System application

## **SMS-MO**

Short Message Service Mobile Originated

## **SN**

Service Number

## **SQL**

Structured Query Language is a database query language.

## **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 is 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.

## **SSF**

Sub Service Field.

## **SSP**

Service Switching Point

## **Switching Point**

Anything that can send and receive C7 messages.

## **System Administrator**

The person(s) responsible for the overall set-up and maintenance of the IN.

## **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.

## **TDP**

Trigger Detection Point.

## **Telco**

Telecommunications Provider. This is the company that provides the telephone service to customers.

## **Telecommunications Provider**

See Telco.

## **Termination Number**

The final number that a call terminates to. Can be set in control plan nodes such as Attempt Termination and Unconditional Termination for re-routing numbers such as Toll Free or Follow Me numbers.

## **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.

## **VWS**

Oracle Voucher and Wallet Server (formerly UBE).





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