



Business Scenario Configuration Guide SAP Convergent Charging (SAP CC 3.0)

Target Audience

- Technology Consultants
- System Administrators
- Solution Consultants

PUBLIC

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Document History



CAUTION

Before you start the implementation or your operations, make sure you have the latest version of this document.

You can find the latest version on SAP Service Marketplace at the following location: ►

<https://service.sap.com/instguidesc30> → Install ◀ or ► <https://service.sap.com/instguides> → SAP Business Suite Applications → SAP Convergent Charging → SAP CC 3.0 → Install ◀.

You can subscribe to this folder.

The following table provides an overview of the most important document changes:

Version	Date	Description
1.0	November 2011	Initial version
1.1	December 2011	Maintenance version available for Support Packages 01 and 02 of SAP Convergent Charging 3.0: <ul style="list-style-type: none"> ■ Reference to the <i>Integration Guide for the Order-to-Cash End-to-End Process</i> ■ Configuration details for the refill logic ■ Minor changes
1.2	April 2012	Maintenance version available for Support Package 03 of SAP Convergent Charging 3.0: <ul style="list-style-type: none"> ■ Updated authorization information for JCo users ■ Updated disclaimer information ■ Updated information about customization of the rerating retention period ■ Updated information about the CDR keeping days in BART Server ■ Added section about the customizing activity for the rerating with BART function in case of integrated scenario with SAP ERP (Consume-To-Cash scenario)
1.3	May 2012	Maintenance version available for Support Package 04 of SAP Convergent Charging 3.0: <ul style="list-style-type: none"> ■ Minor changes (product management in GUI) ■ Added information about subscriber mapping tables (new master data related to the end customers) ■ New Admin+ commands ■ New customizing activities about cache warm-up

Version	Date	Description
1.4	February 2013	<p>Maintenance version available for Support Package 10 of SAP Convergent Charging 3.0:</p> <ul style="list-style-type: none">■ Minor changes■ Added information about SAP CC BART Setup Tool■ Added information about the configuration of the JVM options and the related <i>Customizing</i> activity■ Added reference to the SAP Note 1536317 related to the recommendations of the options of the Java Virtual Machine that are relevant to an SAP CC system

Table of Contents

DOCUMENT HISTORY	3
TABLE OF CONTENTS.....	5
1 INTRODUCTION.....	13
Target Audience	13
About this Document	13
Document Abbreviations	14
2 BEFORE YOU START.....	16
Fundamental Guides	16
Master Guides	16
Configuration Guides (Integrated Scenario).....	16
Global Definitions	17
Business Scenario.....	17
<i>Convergent Charging</i>	<i>17</i>
<i>Processing Charging.....</i>	<i>18</i>
<i>Processing Refilling</i>	<i>19</i>
<i>Creating Billable Items</i>	<i>21</i>
Key Functions of SAP CC 3.0	22
Technical System Landscape	23
Starting and Stopping the Servers	24
<i>MS Windows.....</i>	<i>25</i>
<i>UNIX Operating Systems</i>	<i>25</i>
Configuration and Administration Tools	25
<i>Admin+ Tool</i>	<i>25</i>
<i>Setup Tool.....</i>	<i>31</i>
<i>Configuration Tool</i>	<i>32</i>
<i>BART+ Tool</i>	<i>33</i>
<i>BART Setup Tool.....</i>	<i>36</i>
Important SAP Notes.....	37
Related Documentation	37
Additional Information.....	38
3 CONFIGURATION OVERVIEW	39
Typical Configuration Activities	39
Key Implementation Activities.....	40
<i>Standard Deployment</i>	<i>40</i>
<i>Integrated Deployment with SAP CRM and SAP ERP</i>	<i>41</i>
Transport Management	41
Activities of the Implementation Project	42
<i>Implementation of the Usage Acquisition and Data Collection</i>	<i>42</i>
<i>List of Implementation Activities</i>	<i>43</i>
Data Customization Activities.....	44
4 CORE SERVER CONFIGURATION OF THE TECHNICAL FEATURES	46

System Settings for the License Management	46
<i>Applying for the Permanent License</i>	46
<i>Installing the Permanent License</i>	46
System Settings for the Java Virtual Machine	47
<i>Setting up the JVM Options of an SAP CC 3.0 Core Server System</i>	47
<i>Setting up the Memory for the Rater Instances</i>	47
System Settings for Data Cache Management	48
<i>Setting up the Cache Sizes</i>	48
<i>Advanced: Enabling the Cache Warm-Up Function</i>	49
Settings for the User Management	49
<i>Enabling/Disabling the Security Policy for the Users</i>	49
<i>Setting up the Security Policy for the User Passwords</i>	50
<i>Setting up the SAP Users</i>	51
<i>Resetting the Emergency User (Advanced Procedure)</i>	51
<i>Setting up the User Work Session Management</i>	52
System Settings for Logging and Tracing	52
<i>Setting up the Logging and Tracing Function</i>	52
System Settings for Communications	53
<i>Setting up the Instance Map</i>	54
<i>Setting up the HTTP/HTTPS Connections</i>	55
<i>Enabling the Secured HTTP Connections</i>	56
<i>Installing the Private Keys and Certificates</i>	56
<i>Setting up the Communications via the Web Services</i>	58
<i>Disabling up the UDP Discovery Function (Postinstallation)</i>	58
System Settings for the Database Communication	59
<i>Resetting the Login and Password for the Database (Advanced Procedure)</i>	59
Settings for Time Zones and Dates	59
<i>System Customization: Setting up the Time Zone and Date Management (Implementation)</i>	59
System Settings for the System Landscape Directory	60
<i>Enabling the SLD Data Supplier Function</i>	60
<i>Setting up the SLD Data Supplier Function</i>	60
System Settings for Publishing Notifications (Business and System Alerts)	61
<i>Overview of the Function</i>	62
<i>Notifications</i>	63
<i>Setting up the Notification Policy Function</i>	66
<i>Defining a Concept for the Notification Policy</i>	66
<i>Creating a Notification Policy Configuration File</i>	66
<i>Enabling the Notification Policy Function</i>	67
Implementation Tasks	68
<i>Determining the Sizes of the Data Caches</i>	68
<i>Considering the Cache Warm-Up</i>	70
<i>Determining the Settings for the JVM Options</i>	70
<i>Determining the Settings for the Cache Warm-up</i>	71
<i>Implementing a Notification Handler in Your Java Application</i>	72
5 CORE SERVER CONFIGURATION OF THE BUSINESS FEATURES	75
Usage Online/Offline Acquisition and Data Collection Functions	75
<i>Chargeable Item Acquisition (Implementation Project)</i>	76
<i>Refill Item Acquisition (Implementation Project)</i>	76
Online/Offline Rating and Charging Functions	77
<i>Data Customizing: Setting up the Public Holidays</i>	77

<i>Setting up the Precision and Rounding for Rating and Charging (Implementation Project)</i>	78
Offline Rating and Charging Functions	79
<i>Implementation of the Batch Rating By Group Function</i>	79
<i>Data Customization: Setting up the Batch Rating Groups</i>	79
Rerating Function with BART	79
<i>System Customization: Implementing the Rerating Function</i>	80
<i>Determining the Retention Period for Rerating</i>	81
<i>Changing the Retention Period for Rerating</i>	81
<i>System Advanced Configuration: Enabling the Rerating Function</i>	81
Refilling Function	82
<i>Refilling Directly a Prepaid Account (Implementation Project)</i>	82
<i>Refilling a Prepaid Account from a Technical Data (Implementation Project)</i>	83
Charged Items and Transaction Persistency Functions	83
<i>System Configuration: Setting up the Charged Item and Refill Record File Processor (CIF)</i>	83
Tax Function	84
<i>Quick Configuration</i>	84
<i>Setting up the Tax Functions</i>	84
<i>System Configuration: Enabling the VAT Management Function</i>	85
<i>Data Customization: Setting up the VAT Rates</i>	86
<i>System Configuration: Implementing and Enabling the EZTax Management Function</i>	86
<i>Master Data Configuration: Setting up the Taxes for the Service Provider</i>	87
<i>Master Data Configuration: Setting up the Taxes for the Customers (Subscriber Accounts)</i>	87
Currency Function	87
<i>Quick Configuration</i>	88
<i>Data Customization: Setting up the ISO Currencies</i>	88
<i>Data Customization: Setting up the SAP Currencies</i>	88
<i>Master Data Configuration: Setting up the Currencies for the Service Provider</i>	88
<i>Master Data Configuration: Setting up the Currency for the Customers (Subscriber Accounts)</i>	89
<i>Managing a Currency Reform (Implementation Project)</i>	90
Output Result Data	91
<i>Charged Item Management</i>	91
<i>Refill Record Management</i>	91
<i>Charged Transaction Management</i>	92
Advanced System Configurations	92
<i>Advanced System Configuration: Setting up the Transaction Persistency Processing Mode (TIF)</i>	92
<i>Advanced System Configuration: Generating Files with Charged Transactions and Charged Items</i>	93
<i>Advanced System Configuration: Setting up the Transaction File Processor</i>	94
<i>Advanced system Configuration: Setting up the Data File Processor</i>	94
6 MASTER DATA FOR THE SERVICE PROVIDER	96
Business Objects	96
<i>Master Data</i>	96
<i>Two Data Models</i>	96
Data Settings for the Service Provider	97
<i>Setting up Chargeable Item Classes</i>	97
<i>Setting up Refill Item Classes</i>	98
<i>Setting up Charged Item Classes</i>	99
<i>Recommendations for the Configuration of Charged Item Classes</i>	100
<i>Setting up Refill Record Classes</i>	107
<i>Setting up a Charge</i>	107
<i>Setting up the Refill Logic</i>	108
<i>Setting up the Counter Name Dictionary</i>	108

<i>Setting up a Charge Plan</i>	109
<i>Setting up a Refill Plan</i>	109
<i>Recommendations for the Initialization of Counters Shared In Provider Contracts</i>	110
<i>Setting up an Offer</i>	111
Implementation Tasks	112
<i>Assigning a Charge/Refill Plan to a Commercial Product</i>	112
7 MASTER DATA FOR THE CUSTOMERS	113
Manual Configurations	113
<i>Setting up a Subscriber Account for Testing</i>	113
<i>Setting up a Subscriber Mapping Table</i>	114
<i>Setting up a Provider Contract</i>	114
<i>Setting up a Subscription and Accesses for Testing</i>	115
Implementation Tasks	116
<i>Setting up the Subscriber Accounts (Implementation Project)</i>	117
<i>Setting up the Subscriber Mapping Tables (Implementation Project)</i>	118
<i>Setting up the Provider Contracts and Accesses (Implementation Project)</i>	119
<i>Setting up the Subscriptions and Accesses (Implementation Project)</i>	120
8 CONFIGURATION WITH THE INTEGRATED SCENARIO CONSUME-TO-CASH	122
Overview	122
Overall Prerequisites	123
<i>SAP CRM Configurations and Customizing</i>	123
<i>SAP ERP/FI-CA Configurations and Customizing</i>	124
Typical Configurations	125
Technical Customizing	126
<i>System Settings</i>	126
System Settings for JCo Communication	127
<i>System Settings for the JCo Communications</i>	127
<i>Setting up the jco.destination Used to Connect to the SAP ERP/FI-CA System</i>	128
<i>Setting up the jco.destination Used to Connect to the SAP CRM System</i>	129
System Settings for Secured JCo Communications	129
<i>Implementing Secured JCo Communications</i>	129
<i>Installing the SAP Cryptographic Library</i>	130
<i>Setting up a Personal Security Environment (PSE) for SNC</i>	132
<i>Creating Credentials</i>	133
<i>Exchanging Public-Key Certificates</i>	133
<i>Setting up the JCo Configurations in SAP CC Core Server</i>	134
<i>Maintaining the System ACL on SAP NetWeaver</i>	136
<i>Maintaining the Extended User ACL on SAP NetWeaver</i>	137
System Settings for Communications via the Web Services	137
Basic System Settings related to the Generation of Billable Items	138
<i>Billable Item Management</i>	138
<i>Setting up the Rater Instances (CIF)</i>	138
<i>Setting up the Bulkloader Instances (CIF)</i>	139
<i>Setting up the Default Field Mapping Between CIT and BIT (Implementation Project)</i>	139
<i>Checking the Updater Instances (EIF)</i>	143
System Settings for Notifications via JCo	144
<i>Setting up the Notifications via JCo</i>	144
<i>Setting up the Network Notifications (Implementation Project)</i>	147
Business Customizing	149

Setting up the SAP Currency	150
Customizing the Rerating Function with BART	150
Master Data Basic Settings	151
Setting up the Master Data of the Service Provider	151
Data Settings for Recurring Fee and Recurring Refill Management	155
Data Settings for Price Management with SAP CRM	156
Data Settings for Synchronizations with Bill Cycles in SAP ERP/FI-CA	157
Data Settings for One-Off Fees	158
Setting up a Refill Item Class	158
Setting up a Refill Record Class and the Associated Billable Item Mapping	165
Setting up the Refill Logic	171
Setting up a Usage Refill for the Management of Refills Triggered by the SAP ERP System	177
Setting up a Usage Refill for the Management of Reversals	179
Setting up a Recurring Refill Triggered Periodically	180
Setting up a One-Shot Refill for the Creation of the Contract	181
Setting up a Refill Plan	182
Data Settings for Converting Charged Items and Refill Records into Billable Items	183
Setting up Billable Item Mapping	184
Setting up a Charge Plan	184
Master Data Maintenance	185
Maintaining the Billable Item Mapping	185
Settings for the Communications Taxing Server	187
Setting up a Destination	187
Enabling& Setting up the SLD Data Supplier Function	188
Setting up the Log Directory for the EZTax Log Files	189
Setting up Other Basic Settings	189
Advanced Configurations	189
Setting up a Landscape Without SAP ERP	189
9 SYSTEM CONFIGURATION OF THE USER INTERFACES	191
Settings for the Graphical User Interfaces	191
Setting up the Online Help Systems	191
Setting up the Core Tool	192
Setting up the BART Tool	195
Setting up the Simulation Tool	197
Setting up the Connector Administration Tool	199
Settings for the Command Line Interfaces	200
10 CONFIGURATION OF THE BART SERVER	201
Configuration Tools and Files	201
Configuration File (bart.config)	202
Communication Settings	202
Setting up the Connection to the Database	202
Setting up the Database Connection SQL Failure Management	202
Setting up the Connection to the SAP CC Core Server	203
Setting up the HTTP/HTTPS Connections of the BART Server	204
Enabling the Secured HTTP Connections	205
Installing the Private Key and Certificate	205
Setting up the TCP/IP Connection for the Acquisition or Rerating Functions	206
Enabling& Setting up the SLD Data Supplier Function	206
Basic Settings	207
Setting up the Magic Number Pattern (De-Duplication Function)	207

<i>Setting up the Keeping Days</i>	208
<i>Setting up the Scheduled Job Management</i>	208
Monitoring and Event Broadcasting	209
<i>Setting up the File Report Handler</i>	209
<i>Enabling the Monitoring Function</i>	210
<i>Advanced: Resetting the Customized File Report Handler</i>	211
Technical Settings	211
<i>Setting up the Logging and Tracing Function</i>	211
<i>Changing the Password to Log on to the Core Server</i>	212
<i>Technical Configuration for the Monitoring</i>	212
<i>Technical Configuration for Acquisition Sessions</i>	212
<i>Technical Configuration for CDR Consolidation Cache Management</i>	213
<i>Technical Configuration for Rating Sessions Management</i>	213
<i>Technical Configuration for Rerating</i>	213
Implementation Tasks.....	214
<i>Implementing the CDR Acquisition with the Java API (TCP/IP)</i>	214
<i>Implementing the CDR Acquisition with an IEC</i>	216
<i>Advanced: CDR Acquisition with the Java API (XML/HTTP)</i>	216
<i>Advanced: CDR Acquisition with the XML API</i>	217
<i>Supervision with the Event Handler Framework</i>	218
<i>Setting up the Customized Event Handlers</i>	218
<i>Job Framework</i>	219
11 CONFIGURATION OF THE BART DATABASE.....	220
Partitioning.....	220
Setting up the Partitioning Configuration	220
<i>Setting up the Partitioning Configuration for MS SQL Server</i>	220
<i>Setting up the Partitioning Configuration for Oracle</i>	222
12 CONFIGURATION OF THE DIAMETER SERVER.....	225
Technical Settings	225
<i>Setting up the Quick Configuration</i>	225
<i>Setting up the Basic Configuration</i>	226
<i>Enabling and Setting up the SLD Data Supplier Function</i>	226
<i>Setting up the Logging and Tracing Function</i>	227
Business Settings.....	227
<i>Changing the Settings of the Service Dictionary</i>	227
<i>Changing the Settings of the AVP Dictionary</i>	228
Implementation Tasks.....	228
<i>Setting up the Service Dictionary</i>	228
<i>Setting up the AVP Dictionary</i>	229
13 CONFIGURATION OF THE IEC	230
Basic Settings	230
<i>Setting up a Scenario</i>	230
Implementation Tasks.....	230
<i>Implementing Java Classes for Adding Functions</i>	231
TYPOGRAPHIC CONVENTIONS	232
ICONS.....	232
COPYRIGHTS	233



Disclaimer	234
Documentation in the SAP Support Portal	234



1 Introduction

Target Audience

This document contains both high-level information on an application and business process level as well as very detailed technical information. It is therefore intended for the following audiences:

- Technology consultants
- System administrators
- Solution consultants
- Support specialist

This document is not included as part of the *Installation Guide*, *Security Guide*, *Operations Guide*, or *Upgrade Guide*. Such guides are only relevant for a certain phase of the software life cycle whereas the *Configuration Guide* provides information that is relevant for all the phases:

- Implementation
 - Planning
 - Integration
 - Installation
- Operations & maintenance
- Upgrade

About this Document

For configuring and tuning SAP Convergent Charging software (referred to as SAP CC in this document), the *Configuration Guide* provides some useful guidelines which:

- Gives some hints on main configuration parameters for business functions and technical functions
- Details the configurations of all the master data for the service provider (pricing implementation)
- Provides the implementation activities and tasks to be planned by the project teams during the implementation phase



NOTE

This document is available for both solution scenarios of SAP Convergent Charging for several industries:

- Standard scenario
 - SAP Convergent Charging must be interfaced with external systems to provide convergent charging services (rating, charging, refilling, and rerating)
- Integrated end-to-end scenario
 - SAP Convergent Charging is interfaced with SAP CRM and SAP ERP components of SAP Business Suite: two scenarios *Consume-to-Cash in High-Volume Business* and *Sales and Order Management in Call Center* features the key functions to implement convergent rating, charging, rerating, and refilling services. A complete chapter is dedicated to this integration and its configurations in SAP CC.

This document contains the following main sections:

■ *Overview of the Configurations*

Overview of the different types of configurations including data customization, system configuration, and master data configuration

■ *Configuration of the Technical Features*

Settings of the Core Server for licenses and users

■ *Configuration of the Business Features*

Settings of the Core Server for business features and key functions, master data including the management of input and output of transactional data, currency, and tax management

■ *Configuration of the Master Data for the Service Provider*

Settings of the master data included in the catalogs of the service provider

■ *Configuration of the Master Data for the Customers*

Settings of the master data from the end customers of the service provider

■ *Configuration used for the Integrated Scenario with SAP CRM and SAP ERP/FI-CA*

Settings of the master data and systems for the scenarios: *Consume-To-Cash in High-Volume Business* and *Sales & Order Management in Call Center*

■ *Configuration of the User Interfaces*

Settings for all the tools (Core Tool, BART Tool, CAT, and Simulation Tool)

■ *Configuration of the BART Server*

Settings of the BART Server for the CDR acquisition, rating and charging sessions, and jobs

■ *Configuration of the Diameter Server*

Settings of the Diameter Server for the service dictionary and the AVP dictionary

■ *Configuration of the Import/Export Connector (IEC)*

Settings for scenarios

Document Abbreviations

The table below shows the list of abbreviations used throughout this document.

Abbreviation	Meaning
BIT	Billable Item (SAP Convergent Invoicing)
BART	Batch Acquisition and Rating Toolset
CAT	Connector Administration Tool
CC	SAP Convergent Charging (SAP CC)
CCCIT	Convergent Charging Charged Item See the chapter about the configuration for SAP CI [page 122]
CCA	Credit-Control Answer
CCR	Credit-Control Request
CDR	Consumption Detail Record (SAP CC BART Sever)
CI	SAP Convergent Invoicing (in SAP ERP system) See the chapter about the configuration for SAP CI [page 122]

CIF	Charged item Integration Framework See the chapter about the configuration of the transaction persistency [page 112]
CIT	Charged Item
CT	Communications Taxing
EIF	Exportable item Integration Framework
GC	Garbage Collection
GUI	Graphical User Interface
HA	High Availability
HCI	HTTP Communication Interface
HTTP	HyperText Transfer Protocol
HTTPS	HyperText Transfer Protocol Secure
IEC	Import/Export Connector
JKS	Java Key Store
JRE	Java Runtime Environment
JVM	Java Virtual Machine (JRE)
MB	Mega Bytes (different from Mb: mega bit)
MS	Microsoft Windows
PSE	Personal Security Environment
RDBMS	Relational Database Management System
RIF	Rating Integration Framework
SNC	Secure Network Communications
TIF	Transaction Integration Framework See the chapter about the configuration of the transaction persistency [page 112]
SDK	Software Development Kit SAP CC3.0 provides several kits including API libraries.
SLD	System Landscape Directory
UI	User Interface
URL	Uniform Resource Locator
VAT	Value Added Tax
WSDL	Web Services Description Language
XML	eXtended Markup Language
XSD	XML Schema Definition

2 Before You Start

Fundamental Guides

This *Configuration Guide* contains information about the settings that are required for the business scenario *Convergent Charging*. This guide leads you through the process of performing the initial configuration of SAP CC 3.0. It can be used for other industries.

It provides information about the settings that are required for an integrated scenario with SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite.

This guide requires that the prerequisite software is installed as described in the *SAP CC 3.0 Installation Guide*. It requires your knowledge about the software architecture and the key concepts of SAP Convergent Charging as described in the *Technical Reference Guide* on SAP Service Marketplace at the following location: ► <https://service.sap.com/instguides> → *SAP Business Suite Applications* → *SAP Convergent Charging* → *SAP CC 3.0* → *Plan* ◀.

For a complete list of the available installation and configuration guides, see SAP Service Marketplace at the following location: ► <https://service.sap.com/instguidesc30> → *Install* ◀ or ► <https://service.sap.com/instguides> → *SAP Business Suite Applications* → *SAP Convergent Charging* → *SAP CC 3.0* → *Install* ◀.

Master Guides

SAP CC 3.0 Master Guide

You can find the latest version of the relevant Master Guides on SAP Service Marketplace at the following location: ► <https://service.sap.com/instguidesc30> → *Plan* ◀ or ► <https://service.sap.com/instguides> → *SAP Business Suite Applications* → *SAP Convergent Charging* → *SAP CC 3.0* → *Plan* ◀.

SAP for Telecommunications Master Guide

You can find the latest version of the Master Guide - *SAP for Telecommunications* based on the SAP Business Suite 2011 EHP6 on SAP Service Marketplace at the following location: ► <https://service.sap.com/instguides> → *Industry Solutions* → *Industry Solution Guides* → *SAP for Telecommunications* ◀.

Configuration Guides (Integrated Scenario)

When integrating a scenario with SAP CRM and SAP ERP/FI-CA, you need to be aware of how to configure and customize these components:

- The *Integration Guide for the Order-to-Cash End-to-End Process* is the central starting point for this integrated scenario. It gives an overview of the scenario and guides you through the configuration activities. You can find the latest version of the guide on SAP Service Marketplace at: ► <https://service.sap.com/notes> → *SAP Notes Search* → *Number* → [1647059](https://service.sap.com/notes/1647059) ◀.
- For more information about the relevant configurations for SAP CRM, consult:
 - The *Configuration Guide for SAP CRM 7.0 EhP2* available for the *SAP for Telecommunications* business scenario *Sales and Order Management*

- The guide *Common Object Layer for SAP Business Suite*

**NOTE**

This documentation is available in SAP Solution Manager at: ► *Solutions/Applications* → *SAP For Telecommunications* → *Scenarios* → *Sales and Order Management in Call Center* → *Configuration* ◀.

- For more information about the relevant configurations for SAP ERP and SAP ERP/FI-CA, consult:
 - Financial Customer Care and Dispute Management

**NOTE**

This documentation is available in SAP Solution Manager at: ► *Solutions/Applications* → *Cross Industry Scenarios* → *Scenarios* → *Consume to Cash in High Volume Business* → *Configuration* ◀.

- For more information about the relevant configurations for SAP Convergent Charging 3.0, consult the chapter dedicated to this integrated end-to-end scenario: Configuration with the Integrated Scenario Consume-To-Cash [Configuration with the Integrated Scenario Consume-To-Cash](#) on Configuration with the Integrated Scenario Consume-To-Cash page [122].

Global Definitions

SAP Application

An SAP application is an SAP software solution that serves a specific business area like ERP, CRM, PLM, SRM, SCM, and CC.

Business Scenario

From a microeconomic perspective, a business scenario is a cycle which consists of several different interconnected logical processes in time. Typically, a business scenario includes several company departments and involves other business partners. From a technical point of view, a business scenario needs at least one SAP application (SAP ERP, SAP SCM, or others) for each cycle and perhaps other third party systems. A business scenario is a unit which can be implemented separately and reflects the customer's prospective course of business.

Component

A component is the smallest individual unit considered within the Solution Development Lifecycle. Components are separately produced, delivered, installed, and maintained.

Business Scenario

Convergent Charging

Purpose

With SAP Convergent Charging 3.0, you can charge:

- Customers for services

- Different types of customers (individual, families, companies, and so on) using any form or combination of payment methods such as prepaid, postpaid, or hybrid

SAP CC 3.0 runs on a single system with a single customer base and uses a single set of processes, interfaces, and operational procedures. With a low TCO, this system enables you to manage all your customers and services.

SAP CC 3.0 provides real-time credit control so that you can:

- Control services and manage prepaid balances in real time by checking balances before delivering services to the customer
- Notify the customer when a balance threshold is reached
- Terminate the service session when the balance is depleted

SAP CC 3.0 also provides credit limit management. A credit limit allows your customers to limit the usage of one or more services within a given period of time. When the limit is reached, the service is no longer accessible until the beginning of the next period. Credit limits are managed in the same way as prepaid balances, that is, the system provides credit control for these limits.

SAP CC 3.0 does not manage customer postpaid balances internally but enables you to refer to external postpaid balances stored in a third-party billing system. At the time of charging, SAP CC generates charged items or refill records, and then forwards them to a billing system, such as SAP Convergent Invoicing where the customer invoice is created.

Processing Charging

Purpose

You use this business process to charge customers for usage events that come from network elements (for example, SCP, GGSN, and MMSC) or from application servers. Examples of usage events are a ringtone download, the sending of an SMS, or a voice call.

When a customer uses a service, the network element or application that delivers it sends chargeable items to the system. Once the system has processed the chargeable items, it generates charged items.

In this business process, a network element or an application can interact with the system to:

- Deliver a service and send a chargeable item to the system. If the service delivery fails, the chargeable item is not sent. However, the system can reject the chargeable item even if the service delivery succeeds.
- Send a chargeable item before delivering a service. This avoids the chargeable item being rejected but requires the service delivery to be successful. A prerequisite for this is that the quantity of service used is known before the delivery, which is not the case for session-based services such as voice calls, or GPRS sessions.
- Send a chargeable item and request credit authorization. If the service is delivered, the credit is deducted from the account balance; otherwise, the reserved credit is refunded.

This business process also provides a credit reservation management function when credit authorization is requested.

Prerequisites

To use this business process, you first need to enter master data such as:

- Charge plans for your services, which are combined in a CRM application
- Subscriber accounts including prepaid accounts and external postpaid accounts
- Provider contracts that refer to both charge plans and accounts

Charge plans can be created for the system from the user interface. Subscriber accounts and contracts are usually created from a CRM application such as SAP CRM.

Process Flow

The business process runs in SAP CC 3.0 as follows:

Sequence	Step	Description
1	Receive a chargeable item	
2	Guide the chargeable item	The subscriber account is located by using the technical identifiers of the subscriber (e-mail address, IMSI, MSISDN, and URI SIP) which are part of the chargeable item. The charge plan to be applied is also retrieved according to the service used and the provider contract of the customer.
3	Execute the charge plan	The system executes the charge plan to select the correct tariff based on the properties of the usage item or subscriber data. The chargeable item is then rated to calculate a monetary amount. The charge plan also identifies the account to be charged. Depending on the charging request type, the monetary amount can be either debited from the account or simply reserved for authorization.
4	Generate charged items	The system generates charged items and stores them in files. Charged items are configurable, and they can include: <ul style="list-style-type: none"> ■ Charge plan characteristics ■ Properties that come from the chargeable item ■ Properties computed by the rating and the charging processes ■ Provider contract data (for example, the identifier of the charge plan applied) ■ Account information

Result

This business process uses a prepaid channel and a postpaid channel to generate charged item files. These files can be converted and loaded into the billing system.

Processing Refilling

Purpose

You use this business process to refill the prepaid accounts for your customers. Also known as a top-up process in the telecommunications sector, this process credits the prepaid account for a customer. A credit is usually a monetary amount but can also include a quantity of services, such as 100 SMS, 20 MB of data, for example. The customer can use the credit to purchase goods or services (see the process Processing Charging).

This business process refills a prepaid account:

- **Manually:** The customer refills their prepaid account directly by using different points of services (ATM, call centre, or website) to transfer a credit from a refill card, a bank account, or a prepaid account to their prepaid account.
- **Automatically:** The system triggers the refills automatically for the customer. The system can trigger a refill either periodically or when the prepaid account balance goes below a threshold defined by the customer.

When a customer requests a manual refill, the application that manages it (for example, a Voucher Management System) sends a refill item to the system. To define the refill, the refill item includes some properties, such as its origin (point of service) or associated gifts. After processing the refill item, the system generates a refill record.

The system triggers automatic refills internally and also generates some refill records.

Prerequisites

To use this business process, you first need to enter master data such as:

- Refill plans combined in a CRM application
- Subscriber account with a prepaid account
- Provider contract that refers to both a refill plan and a prepaid account

Refill plans can be created for the system from the user interface. Subscriber accounts, prepaid accounts, and provider contracts are created from a CRM application such as SAP CRM.

Process Flow

The following business process runs in SAP CC as follows:

Sequence	Step	Description
1	Receive a refill item	The system receives a refill item through APIs. This refill item refers to a prepaid account that is known to the system.
2	Guide the refill item	The system retrieves the unique refill plan activated in a provider contract for the customer and that refers to the prepaid account to be refilled.
3	Execute the refill logic	The system executes the refill plan logic, computes the credit to add to the prepaid account, and updates the prepaid balance and the counters of the related services accordingly.
4	Generate refill records	<p>The system generates refill records and stores them in files. Refill records are configurable and can include:</p> <ul style="list-style-type: none"> ■ Refill plan characteristics (for example, the identifier of the refill plan executed) ■ Provider contract data ■ Origin of the refill (for example, one-time, periodic, or voucher) ■ Properties of the refill item

		<ul style="list-style-type: none"> ■ Computed properties (for example, the added credit per service) ■ Prepaid account information (for example, the balance or the state of the prepaid account)
--	--	---

**NOTE**

Steps 1 and 2 are not required for automatic refills.

Result

This business process uses a prepaid channel to generate the refill record files. These files can be converted and loaded in SAP ERP/FI-CA Convergent Invoicing (see the business process *Creating Billable Items*).

Creating Billable Items**Purpose**

You use this business process to create billable items from either the charged items (prepaid and postpaid) generated by the charging process or the refill records generated by the refilling process.

The system converts charged items and refill records into billable items, and sends them to Convergent Invoicing in SAP ERP.

You can configure the way in which charged items and refill records are mapped onto billable items. However, some of the fields in a billable item are mandatory. The account identifier is for example used to link the billable item to an account in SAP ERP.

**NOTE**

This process is only relevant for an integrated scenario with SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite. It is interfaced with the business processes of the *Convergent Invoicing* business scenario.

Prerequisites

To use this business process, you first need to set up the billable item mapping for the charging and refilling processes in the system.

Process Flow

The business process runs in SAP CC 3.0 as follows:

Sequence	Step	Description
1	Convert charged items and refill records	The system periodically reads charged items and refill records from files in both the postpaid and prepaid channels. Charged items and refill records are then converted into billable items according to how they are mapped.

2	Send billable items	The system sends billable items to the billing and invoicing functions in SAP ERP.
---	---------------------	--

Result

Convergent Billing is the follow-on business process.

Key Functions of SAP CC 3.0

The business processes are implemented by the following functions:

Key Function Name	Process Variants		SAP CC Software Unit
	Offline Charging	Online Charging	
	<div><div></div>Postpaid</div>	<div><div></div>Postpaid</div> <div><div></div>Prepaid</div>	
Usage Acquisition and Collection Functions			
CDR Acquisition and Consolidation	<div><div></div></div>		BART Server
Credit Control Messages Conversion		<div><div></div></div>	Diameter Server
Chargeable Item Collection		<div><div></div></div>	Core Server
Refill Item Collection		<div><div></div><div>Prepaid only</div></div>	Core Server
Rating, Charging, Rerating and Refilling Functions			
Usage Rating and Subscriber Account Charging	<div><div></div></div>	<div><div></div></div>	Core Server
Session-based Rating and Charging		<div><div></div></div>	Core Server
Refilling		<div><div></div><div>Prepaid only</div></div>	
Activation	<div><div></div></div>	<div><div></div></div>	Core Server
Rerating	<div><div></div></div>		Core Server, BART Server
Stateless Usage Rating (deprecated)		<div><div></div></div>	Core Server
Inverse Rating (deprecated)		<div><div></div></div>	Core Server
Prerating and Postrating (deprecated)		<div><div></div></div>	Core Server
Master Data Management			
Service Provider Catalog Data Building	<div><div></div></div>	<div><div></div></div>	Core Server

Customer Data Provisioning	■	■	Core Server
Output Data Record Management			
Charged Transaction Persistency	■	■	Core Server
Charged Item Generation	■	■	Core Server
Refill Record Generation		■	Core Server
Charged Item or Refill Record Bulk Loading (*)	■	■	Core Server

Consult the *Technical Reference Guide* for more information about these processes, see page [\[37\]](#).



NOTE (*)

Only available in an integrated scenario with SAP ERP/FI-CA component of the SAP Business Suite.

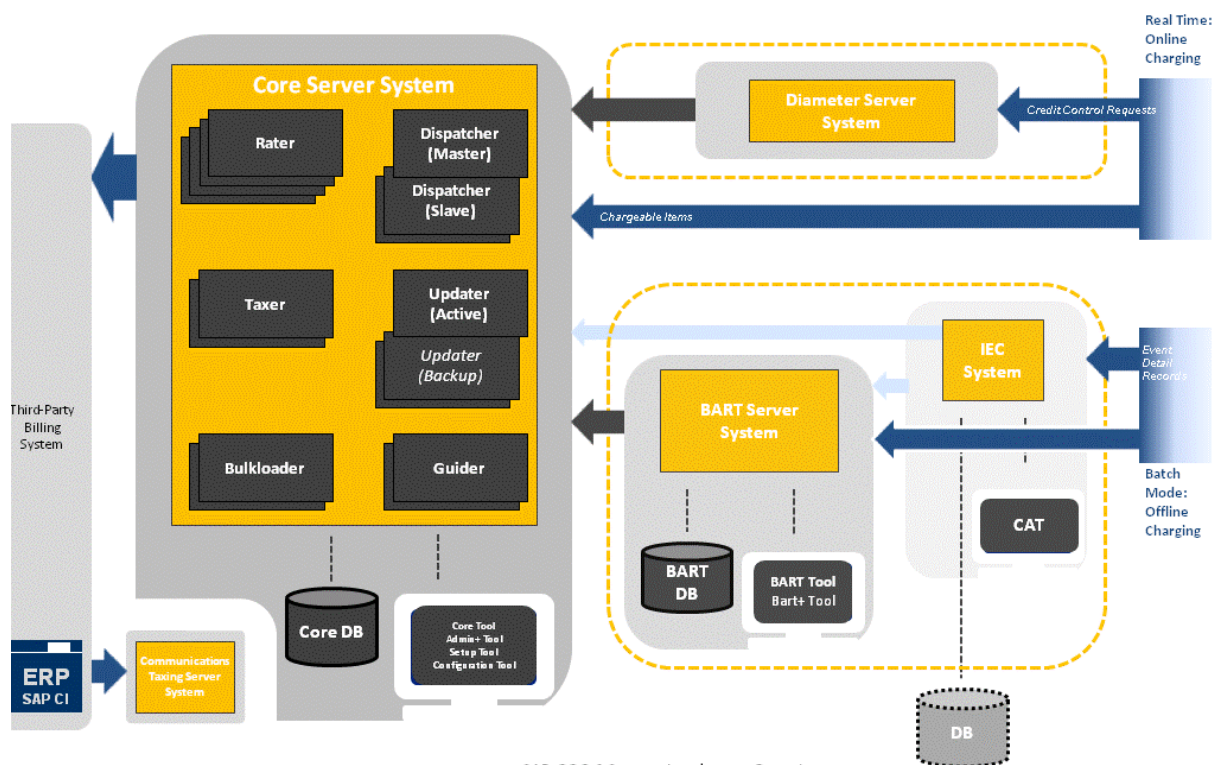
Technical System Landscape

The following SAP product version and instance is mandatory for the implementation of SAP Convergent Charging software:

SAP CC 3.0 Software Component Instance - Applications	Optional
Core Server <i>Core Server Instances</i> <i>Setup Tool</i> <i>Configuration Tool</i>	Mandatory
Core SDK <i>Java libraries</i>	X <i>This component is recommended for sending usage events to be charged to the Core Server from a Java based application. It is also used for the provisioning services.</i>
Core Tool <i>Core Tool</i> <i>Admin+ Tool</i>	Mandatory for configuring the Core Server
BART Server	X <i>These components are recommended for providing batch mode rating and charging services to your network element or application.</i>
BART SDK <i>Java libraries</i>	
BART Tool <i>BART Tool</i> <i>BART+ Tool</i>	
Diameter Server <i>Diameter Server</i>	X <i>This component is mandatory for providing real time credit control services (via diameter protocol) to your network element or application.</i>

Simulation Tool <i>Simulation Tool</i>	X
Communications Taxing Server <i>CT Server</i>	X <i>This component is recommended for providing US telecommunication tax calculation services to SAP Convergent Invoicing in the SAP ERP system.</i>
IEC <i>Import/Export Connector</i> <i>Import/Export Connector Server</i>	X <i>These components may be used with BART components for the offline charging services</i>
IEC Tool <i>CAT (Communication Administration Tool)</i>	

Consult the *Master Guide* for the software component matrix to know which software components to use for your business scenario.



Starting and Stopping the Servers

The same procedure is available for all the servers of SAP Convergent Charging:

- Core Server
- BART Server
- Diameter Server
- Communications Taxing Server

MS Windows

The SAP Management Console (sapmmc) was installed during the installation of SAP CC 3.0. It enables you to see all your SAP systems and to manage them.

To start a server of SAP CC:

- Double-click the icon on your computer desktop to start the SAP Management Console
- Click the SAP system containing the server you want to start
- Right-click the instance or the server you want to start, and then choose *Start*

Use the same procedure to stop the servers. For the last step, right-click the instance or the server you want to stop, and then choose *Stop*.

UNIX Operating Systems

SAP Management Console (MC)

The SAP Management Console (sapmc) was installed during the SAP CC Core Server installation. It enables you to see all your SAP systems and to manage them. It is installed in the following folders:

- /usr/sap/<system_id>/SYS/exe/uc/<platform>/servicehttp/sapmc/sapmc.html
- /usr/sap/<system_id>/<instance_id>/exe/servicehttp/sapmc/sapmc.html (in each instance folder)

To launch this tool:

- Launch a web browser capable of running Java applications
- Open the sapmc.html file from the host

SAP Control

Use the sapcontrol program to start and stop the servers. This program is installed in the /usr/sap/hostctrl/exe directory.

Use the following options:

- **-host**: To specify on which host is the server you want to manage
- **-user**: To specify the user you want to use for managing the server (use the sapadm user created during the installation, for example)
- **-function**: To specify the command to apply to the server (**start**, **stop**, and so on)
- **-nr**: To specify the number of the SAP instance

Configuration and Administration Tools

Admin+ Tool

The Admin+ tool is a console utility that allows you to manage local or remote instances of the SAP CC Core Server system and changes their parameters. This tool is included in the SAP CC Core Tool software unit. The main functions of admin+ allow you to:

- Get the list and details about the known instances of the server (see command: **list**)
- Get server properties (see command: **get**)
- Set server properties (immediate temporary changes or permanent changes)
- Manage batch rating groups
- Reset cache, SQL connections, and user work sessions

The use of all these commands is detailed in this guide. The changes are not immediate and some instances of the SAP CC Core Server must be restarted manually.



NOTE

Do not use the Admin+ tool for stopping an instance of the server because it will be automatically restarted.

Start the Tool

- On the Microsoft Windows operating system, the administrator opens a CMD/DOS console to type the commands and verify the results. In the *Start* main menu of MS Windows, select the *Execute...* sub-menu and type: `cmd` in the popup window which is displayed. Launch the `admin+.bat` script from the directory:
 - `<drive>:\usr\sap\<SYSTEM_ID>\CCD<instance_number>\script\` where `<instance_number>` is the number automatically assigned to the Dispatcher instance by the system
- On the UNIX operating system, the administrator opens a console to type the commands and verify the results. Launch the `admin+.sh` script from the directory:
 - `/usr/sap/<SYSTEM_ID>/CCD<instance_number>/script/` where `<instance_number>` is the number automatically assigned to the Dispatcher instance by the system

Connect and Log On

The Admin+ tool communicates with the Dispatcher instance(s) of the Core Server via the XML/HTTP protocol.

- Once you have started the Admin+ Tool, type `host`
- Enter the host name where a Dispatcher instance of the Core Server is started
- Enter the port number used by this instance
- Type the command `user`
 - Enter your login as administrator (default login: `admin`)
 - Enter your password

The Admin+ Tool displays the prompt ' `[myhost] Instance_id>`'. The tool is ready to accept commands.

Getting Help




You can use the `help` command for listing the available commands and getting help on a particular command. Type `help set` to display information about the `set` command.



Commands


Admin+ Tool Command	Description
---------------------	-------------

Admin+ Tool Command	Description
<code>admin_sql_connection</code>	<p>Reconnect or disconnect all the guider and rater instances of the SAP CC Core Server system to an Oracle RAC database.</p> <p>Scope: Database communications</p> <p>You use this command:</p> <ul style="list-style-type: none"> ■ When you plan to shut down an instance of the Oracle RAC database ■ After you restart an instance of the Oracle RAC database to reset the communications with SAP CC
<code>debug</code>	<p>Advanced (for troubleshooting):</p> <p>Activates the DEBUG mode of the Admin+ Tool to trace the messages exchanged by this user interface with the instances of the SAP CC Core Server</p> <p>See also: <code>normal</code> command</p>
<code>delete_user_session</code>	<p>Deletes a user work session after a system failure of the graphical user interface</p> <p>See also: <code>search_user_session</code> command</p>
<code>dump</code>	<p>Advanced (for system troubleshooting):</p> <p>Shows the thread dump of an instance of the SAP CC Core Server system</p>
<code>get</code>	<p>Gets the value of a server parameter or gets the list of available parameters</p> <p>See also: <code>set</code> and <code>reset</code> commands</p>
<code>groupadd</code>	<p>Scope: Business customization</p> <p>Creates a batch rating group</p> <p>See also: <i>Configuration Guide</i></p>
<code>groupdel</code>	<p>Deletes a batch rating group</p> <p>See also: <code>groupadd</code> command</p>
<code>grouplist</code>	<p>Lists all the batch rating groups</p> <p>See also: <code>groupadd</code> command</p>
<code>groupmod</code>	<p>Modifies a batch rating group</p> <p>See also: <code>groupadd</code> command</p>
<code>help</code>	Displays the available commands
<code>host</code>	Specifies the host name of the machine you want to connect to and its port number for the HTTP Communication Interface (HCI). The active Dispatcher instance of the Core Server System is running on this host.
<code>id</code>	Shows the current user and the host

Admin+ Tool Command	Description
list	List and summarize all the instances of the SAP CC Core Server System
logs	Get the last server logs
normal	Advanced (for troubleshooting): De-activates the DEBUG mode of the Admin+ Tool and comes back to the default normal mode See also: debug command
output	Redirect the output to a file
ping	Test the connection to an instance of SAP CC Core Server
quit	Stop the Admin+ Tool
rc	Advanced: Reset the subscription data cache
refresh_raters	Scope: Troubleshooting, offer management When a power user has modified or created an object such as an offer, a charge, a translation table, or a pricing macro, a few minutes are needed to update the rating and charging services; therefore, if the power user needs to update the system quickly when working in test or training environment for example, he sometimes forgets to use the command <i>Refresh Rating Instances</i> in the Core Tool of SAP CC. In this case, you can force the refresh as SAP CC system administrator.
refresh_sql_connections	Scope: Management of the failover between your database primary instance(s) and your database backup instance(s) of Oracle RAC. When the database primary instance is repaired after a downtime, you can recover a normal situation by using the <code>refresh_sql_connection</code> command: The SAP CC Core Server system will switch back all the connections from the backup instance(s) to the primary instance(s) of Oracle RAC. Recommendation For the rater instances and the guider instances of the SAP CC system, use first the <code>admin_sql_connections</code> command.
refresh_tax_cache	VAT

Admin+ Tool Command	Description
refresh_transerv_list	<p>Update the transaction service types from BillSoft EZTax that are displayed by the Core Tool of SAP CC. This command updates also the Updater instances of the SAP CC Core Server system.</p> <p> NOTE</p> <p>Consult the <i>Operations Guide</i> for details about the maintenance of the Taxer instances of the SAP CC Core Server system.</p>
reset	<p>Reset a system parameter to its default value</p> <p>See also: <code>get</code> and <code>set</code> commands</p>
server	<p>Manage the instances of the SAP CC Core Server system</p>
set	<p>Set the value of a parameter temporary in the memory of a system or in a permanent and persistent mode (value stored in the database for the next restart of the system).</p> <p> NOTE</p> <p>Consult the help about <code>scope</code> for details about temporary changes (in memory) and permanent changes (persistent scope).</p>
start_activation	<p>Starts the activation process to trigger the periodic fees and the one-shot fees for all the subscriptions in SAP CC</p> <p>This command freezes your Admin+ tool until all the subscriptions have been activated by the SAP CC Core Server system.</p> <p>See also: <code>stop_activation</code> command</p> <p> NOTE</p> <p>To stop the activation process, you must launch another Admin+ tool and use the <code>stop_activation</code> command.</p>

Admin+ Tool Command	Description
start_cache_warmup	<p>Advanced: Force the execution of the warm-up function for the data caches to preload master data related to the end customers</p> <p>Prerequisites</p> <ul style="list-style-type: none"> ■ The data cache warm-up function is enabled (see the CACHE_WARMUP_THREAD_COUNT parameter) ■ You use this command after the creation or the maintenance of a large volume of master data related to the end customers (subscriber accounts, contracts, others): <ul style="list-style-type: none"> ● Initial mass provisioning during implementation phase ● Mass provisioning of new data during production phase ● Migration of data (implementation or production phase) <p> NOTES</p> <p>This command is mandatory for a production system if you require very high continuous performance and high availability.</p> <p>For more information about the provisioning processes and the related implementation activities, consult the <i>Technical Reference Guide</i> and the <i>Configuration Guide</i> of SAP Convergent Charging.</p>
start_contract_activation	<p>Starts the activation process to trigger the periodic fees and the one-shot fees for all the provider contracts in SAP CC</p> <p>This command freezes your Admin+ tool until all the subscriptions have been activated by the SAP CC Core Server system.</p> <p>See also: stop_contract_activation command</p> <p> NOTE</p> <p>To stop the activation process, you must launch another Admin+ tool and use the stop_contract_activation command.</p>

Admin+ Tool Command	Description
start_cleanup	<p>Scope: Operations</p> <p>Triggers the cleanup process by inspecting all the provider contracts and all the subscriptions involved in a session-based charging operation.</p> <p>The cleanup process handles the subscriptions that are involved in a prerate operation (deprecated function).</p> <p>This command freezes the Admin+ Tool until the entire cleanup is done.</p> <p>See also: stop_cleanup command</p> <p> NOTES</p> <ul style="list-style-type: none"> ■ To know when to use this command, see the <i>Operations Guide</i> ■ To stop the cleanup, you have to launch another Admin+ Tool and use the stop_cleanup command ■ For more information about the cleanup process, consult the <i>Technical Reference Guide</i>
stop_activation	Stop the activation process if it is running in the SAP CC Core Server
stop_contract_activation	Stop the activation process if it is running in the SAP CC Core Server
stop_cleanup	Stop the cleanup process if it is running in the SAP CC Core Server system
unlockpc	Unlock a provider contract
unlockpcs	Unlock a set of provider contracts
unlocksub	Unlock a subscription
unlocksubs	Unlock a set of subscriptions
url	<p>Specify directly the complete URL of the instance of the SAP CC Core Server to connect to</p> <p>See also: host command</p>
user	Log on and authenticate as SAP CC User

Setup Tool

The Setup tool is a command line program that helps you manage the SAP CC Core Server by changing its configurations directly in the SAP CC Core Database. This user interface is included in the Core Server component. The main functions allow you to:

- Manage the licenses – for all instances
- Manage the certificates and the key entries for secured HTTP service
- Manage the notification policy

- Manage the CIF configuration – for the Rater and the Bulkloader instances
- Manage the RIF configuration – for the Rater instances
- Manage the SAP CI (SAP ERP / FI-CA) configuration – for the Updater instance
- Manage the VAT taxation policies
- Manage the EZTax transaction/service types

The use of all these commands is detailed in this document. The changes are not immediate and some relevant instances of the Core Server must be restarted.

Getting Help

You can simply use the **help** command for listing the available commands and getting help on a particular command.

Connect and Log On

Each command must be authenticated with a SAP user login and password (except for the **help** command).

Execute the Tool

The Setup tool is available from the Dispatcher instances of the Core Server. It communicates with the Core Database.

- Go to one of the following directories:
 - <drive>:\usr\sap\<SYSTEM_ID>\CCD<instance_number>\script\ (MS Windows)
 - /usr/sap/<SYSTEM_ID>/CCD<instance_number>/script/ (UNIX)

Where <instance_number> is the number automatically assigned to the Dispatcher instance by the system.

- Execute the appropriate script with the correct arguments:
 - **setup.bat** (MS Windows)
 - **setup.sh** (UNIX)

Configuration Tool

The Configuration tool is a command line program that helps you manage the SAP CC Core Server system by changing its configurations directly in the Core Database. This user interface is included in the Core Server component.

The main function allows you to export and import the persistent values of all the configuration parameters of the Core Server system. The changes are not immediate and some relevant instances of the Core Server must be restarted according to your actions. If you want to change only one parameter or if you want to apply changes temporary, you can use the Admin+ tool with the **set** and **get** commands.

You can use this tool to transport a complex configuration of the Core Server system from a development landscape to a quality assurance landscape.

Getting Help

You can simply use the **help** command for listing the available commands and getting help on a particular command.

Connect and Log On

Each command must be authenticated with a SAP user login and password (except for the **help** command).

Execute the Tool

The Configuration tool is available from the Dispatcher instances in the installation folder. It communicates directly with the Core Database.

- Go to one of the following directories:
 - <drive>:\usr\sap\<SYSTEM_ID>\CCD<instance_number>\script\ (MS Windows)
 - /usr/sap/<SYSTEM_ID>/CCD<instance_number>/script/ (UNIX)

Where <instance_number> is the number automatically assigned to the Dispatcher instance by the system

- Execute the **config** script (*.bat or *.sh) with the correct arguments.

Tasks

- Start always working by exporting the configuration in a file
 - Use the command: **config configuration export**
- Set up your changes in the file
- Import the configuration file
 - Use the command: **config configuration import**
- Restart the relevant instances of the Core Server

BART+ Tool

The BART+ tool is a console program that helps you manage the SAP CC BART Server system by changing its parameters. This user interface is included in the BART Server component. The main functions allow you to:

- Get or set the values of the configuration parameters of the BART Server system (see **get** and **set**)
- Change immediately the log level of the BART Server
- Monitor the acquisition sessions (see **monitor**)
- Intercept messages and redirect them to a specified file
- Ping the BART Server System

The use of all these commands is detailed in this document. The changes are not immediate and some relevant instances of the BART Server must be restarted.

Start the Tool

- The administrator opens a CMD/DOS console to type the commands and verify the results. In the **Start** main menu of MS Windows, select the **Execute...** sub-menu and type: **cmd** in the new displayed popup window. Launch the **bart+.bat** script from the directory:

- <drive>:\usr\sap\<SYSTEM_ID>\CAB<instance_number>\script\ where <instance_number> is the number automatically assigned to the SAP CC BART Server instance by the system
- On UNIX, the administrator opens a console to type the commands and verify the results. Launch the bart+.sh script from the directory:
 - /usr/sap/<SYSTEM_ID>/<instance_ID>/script/ where <instance_ID> is the number automatically assigned to the instance of the BART Server System

Connect and Log On

The BART+ tool communicates with the SAP CC BART Server via XML/HTTP (see HCI technical interface).


- Once you have started the BART+ Tool, type **host**
- Enter the host name where a BART Server is started
- Enter the port number
- Type the command **user**
 - Enter your login as administrator (default login: admin)
 - Enter your password

Getting Help

You can use the **help** command for listing the available commands and getting help on a particular command. Type **help set** to display information about the **set** command.

Commands

BART+ Tool Command	Description
debug	Advanced (for troubleshooting): Activates the DEBUG mode of the BART+ Tool to trace the messages exchanged by this user interface with the instance of the BART Server System See also: <code>normal</code> command
dump	Advanced (for troubleshooting): Shows the thread dump of an instance of the BART Server System
get	Gets the value of a server parameter or gets the list of available parameters See also: <code>set</code> and <code>reset</code> commands
help	Displays the available commands
host	Specifies the host name of the machine you want to connect to and its port number for the HTTP Communication Interface (HCI). The BART Server System is running on this host.
id	Shows current user and host

BART+ Tool Command	Description
monitor	Monitors the job sessions of the BART Server System (usage acquisition, rating, and charging)
normal	Advanced (for troubleshooting): De-activates the DEBUG mode of the Admin+ Tool and comes back to the default normal mode See also: debug command
output	Redirect the output to a file
ping	Test the connection to an instance of SAP CC Core Server
quit	Stop the Admin+ Tool user interface
server	Manage the instance of the BART Server
set	Set the value of a parameter temporary in the memory of a system or in a permanent and persistent mode (value stored in the database for the next restart of the system).  NOTE Consult the help about <code>scope</code> for details about temporary changes (in memory) and permanent changes (persistent scope).
url	Specify directly the complete URL of the instance of the SAP CC BART Server System to connect to See also: <code>host</code> command
user	Log on and authenticate as SAP CC User

**EXAMPLE**

Launch the Admin+ tool console program:

```
SAP BART Server 3.0.0.0 Administration
Copyright (C) 2002-2008 SAP. All rights reserved.
Server identified by URL: http://hostname:9009/
bart+ > help
List of available commands:
+-----+-----+-----+
|Name   |Availability|Description|
+-----+-----+-----+
|debug  |bart+      |Activates DEBUG mode|
+-----+-----+-----+
|dump   |bart       |Displays server threads dump|
+-----+-----+-----+
|get    |bart       |Gets the value of a server parameter|
+-----+-----+-----+
```

```
|help    |bart+      |Shows help                                |
+-----+-----+-----+
|host    |bart+      |Defines the server                        |
+-----+-----+-----+
|id      |bart+      |Shows current user and host              |
+-----+-----+-----+
|monitor|bart       |Monitors the sessions from BART server|
+-----+-----+-----+
|normal  |bart+      |Activates NORMAL mode                    |
+-----+-----+-----+
|output  |bart+      |Redirects output to a file                |
+-----+-----+-----+
|ping    |bart       |Pings SAP BART server                    |
+-----+-----+-----+
|quit    |bart+      |Stops the application                    |
+-----+-----+-----+
|server  |bart+      |Manages SAP server                       |
+-----+-----+-----+
|set     |bart       |Sets the value of a server parameter    |
+-----+-----+-----+
|url     |bart+      |Defines the server                        |
+-----+-----+-----+
|user    |bart+      |Authenticates the user                    |
+-----+-----+-----+

bart+ >
```

You can use the `host` and `user` commands to log on.

BART Setup Tool

The BART Setup Tool is a command line program that helps you manage the SAP CC BART Server system by changing its configuration.

This user interface allows you to manage the certificates and the key entries used during:

- Communications with the SAP CC Core Server, which use both the XML over HTTP and Packets over TCP/IP channels
- Communications with client applications, which use both the XML over HTTP and Packets over TCP/IP channels

Getting Help

You can simply use the `help` command for listing the available commands and getting help on a particular command.

Execute the Tool

The BART Setup Tool program is available from the SAP CC BART Server system.

■ Go to one of the following directories:

- <drive>:\usr\sap\<SID>\CAB<instance_number>\script\ (MS Windows)
- /usr/sap/<SID>/CAB<instance_number>/script/ (UNIX)

Where <instance_number> is the number automatically assigned to the unique instance of the SAP CC BART Server system.

■ Execute the appropriate script with the correct arguments:

- `setup.bat <COMMAND_AND_ARGS> [-login=<USR_LOGIN>] [-password=<USR_PASSWORD>]` (MS Windows)
- `setup.sh` (UNIX)

Important SAP Notes

SAP Note Number	Title
1647059	Integration within the Order to Cash End-to-End Process
797147	CA Wily Introscope Installation for SAP Customers
669669	Updating the SAP Component Repository in the SLD

Related Documentation

The following table lists where you can find more information about SAP CC 3.0 features and functions on SAP Service Marketplace or in SAP Help Portal.

Lifecycle Phase	Document	Location
Implementation	Technical Reference Guide	► https://service.sap.com/instguidesc30 → Plan → <i>Technical Reference Guide</i> ◀
Implementation	Java API Specifications (Javadoc)	► https://service.sap.com/instguidesc30 → Plan → <i>Javadocs</i> ◀
Implementation	SOAP API Specifications (Web Services Documentation)	► https://service.sap.com/instguidesc30 → Plan → <i>Web Services Documentation</i> ◀
Implementation	Sizing Sheet	► https://service.sap.com/instguidesc30 → Plan → <i>Sizing Sheet</i> ◀
Implementation	Configuration Guide	► https://service.sap.com/instguidesc30 → <i>Install</i> → <i>Configuration Guide</i> ◀
Operation		
Implementation	System Parameter Reference	► https://service.sap.com/instguidesc30 → <i>Install</i> → <i>Configuration Parameter Reference</i> ◀

Operation		
Operation	Operations Guide	► https://service.sap.com/instguidesc30 → <i>Operate</i> → <i>Operations Guide</i> ◀

**NOTE**

All the publications that are directly accessible in SAP Help Portal can also be downloaded on SAP Service Marketplace but you need an authorized user ID to access this information.

Additional Information

For more information about specific topics, see the quick links shown in the table below.

Content	Quick Link on SAP Service Marketplace
Security	https://service.sap.com/security
Security Guides	https://service.sap.com/securityguide
Related SAP Notes	https://service.sap.com/notes
Released Platforms	https://service.sap.com/platforms
SAP Solution Manager	https://service.sap.com/solutionmanager
Installation & Upgrade Documentation	https://service.sap.com/instguides
SAP Convergent Charging Information Center	https://service.sap.com/instguidesc30 Information Centers of SAP CC3.0 are available from Service Marketplace at: ► https://service.sap.com/instguides → <i>SAP Business Suite Applications</i> → <i>SAP Convergent Charging</i> ◀

3 Configuration Overview

Typical Configuration Activities

Typical Configuration Activities	Description	Example
System Integration	SAP Convergent Charging is not a standalone solution. It must be interfaced with several external systems to perform its key rating and charging functions.	<p>The relevant scopes are:</p> <ul style="list-style-type: none"> ■ Usage Acquisition and Collection <ul style="list-style-type: none"> ● Mediation system ● Web Application ● Network Element ■ Billable Data Transfer <ul style="list-style-type: none"> ● billing system ● invoicing system ● financial system ■ Master Data Management and Provisioning <ul style="list-style-type: none"> ● CRM system ● Provisioning or legacy system ■ Alert, Monitoring and Reporting Functions
Customizing		
	<p>System Customizations</p> <p>The behavior of certain systems of SAP Convergent Charging must be customized to implement your business scenario.</p>	Online usage acquisition
	<p>Data Customizations</p> <p>Certain types of data can be customized for each implementation project after the initial installation. This data are not the master data.</p> <p>SAP Convergent Charging provides always default sets of data.</p>	Public holidays, tax rates
Configuring		

	<p>System Configurations</p> <p>Some configurations are managed at system level and include two types of settings:</p> <ul style="list-style-type: none"> ■ Technical settings are not related to a business function or have no specific sense for a business function ■ Business settings are related to a business function of the system 	<ul style="list-style-type: none"> ■ Technical settings: <ul style="list-style-type: none"> ● number of output channels ● licensing ● user management ■ Business settings:
	<p>Master Data Configurations</p> <p>Key business data must be created in SAP Convergent Charging:</p> <ul style="list-style-type: none"> ■ Charging data for the service provider ■ Charging data for each customer 	

Key Implementation Activities

The key activities for implementing SAP Convergent Charging on your landscape include:

- Standard Deployment
- Integrated Deployment with SAP CRM and SAP ERP

Standard Deployment

The following project implementations may be scheduled for implementing SAP Convergent Charging 3.0 in your landscape:

Key Implementation Scope	Scope of the Implementation	
Usage Acquisition and Data Collection	<p>The data records resulting from the usage and the consumption of a marketable service of a service provider must be acquired by SAP Convergent Charging from mediation systems or application servers.</p> <p>This also includes the collection of refill requests.</p>	Input Data
Billable Data Transfer	The data records resulting from the rating, charging, and refilling functions performed by SAP Convergent Charging	Output Data

	must be taken into account by an external billing system	
Master Data Management and Provisioning	<p>A CRM or an external provisioning system must combine charging data related to a service provider</p> <p>A CRM or an external provisioning system must create and maintain charging data related to the customers of a marketable service</p>	Master Data Creation and Exchange
Alert, Monitoring and Reporting Functions		Output Data

Integrated Deployment with SAP CRM and SAP ERP

When a scenario is integrated with SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite, all the relevant implementations are provided by default as part of the integration of these components.

You need only to implement the Usage Acquisition and Collection process, customize, and configure the other processes:

Key Implementation Scope	Description	Default Integration
Usage Acquisition and Data Collection	<p>The data records resulting from the usage and the consumption of a marketable service from a service provider must be acquired by SAP Convergent Charging from mediation systems or application servers</p> <p>In this integrated scenario, the refill request management is available by default</p>	No <i>(only for the refill management)</i>
Billable Data Transfer	Billable Items (BIT) are massively transmitted to the SAP ERP system as the results of the rating, charging, rerating, and refilling functions	Yes
Master Data Management and Provisioning	The SAP CRM and SAP ERP systems can create and maintain relevant master data in SAP Convergent Charging	Yes
Alert, Monitoring and Reporting Functions	Notifications are transmitted to the SAP CRM and the SAP ERP/FI-CA systems	Yes

For more information, see the chapter dedicated to customization and configuration, page Configuration with the Integrated Scenario Consume-To-Cash [122](#).

Transport Management

You can manually transport the configurations by using the following tools of SAP Convergent Charging 3.0 from a development landscape to a test landscape and to the final production landscape:

Configurations	Tool	Description
System Customization		You need to transport the Java binaries between two landscapes from your developments. The transport tools depend on the development environment of the SAP client.
Data Customization	Core Tool	You can export and import customized data stored in files between two landscapes.
System Configuration	Admin+ Tool	
Master Data Configuration	Core Tool	Between two landscapes, you can export master data stored in files and related to a service provider. Note that customer data (subscriber accounts, subscriptions, and provider contracts) is out of scope of the transport concept.

Activities of the Implementation Project

Implementation of the Usage Acquisition and Data Collection

Environment	Description	Configuration
Online	<p>The data records resulting from the usage and the consumption of a marketable service of a service provider must be acquired by SAP Convergent Charging from mediation systems or application servers</p> <p>Different variants are available:</p> <ul style="list-style-type: none"> ■ Charging ■ Session-based Charging ■ Blank Charging ■ Stateless Rating 	The implementation is a Java development and system configurations of the Core Server
	<p>The data records resulting from the usage and the consumption of a marketable service of a service provider are available via a technical interface based on Diameter protocol.</p> <p>SAP Convergent Charging includes a system to acquire data from the related channel (Diameter Server).</p>	<p>The implementation is mostly a modeling of the Service Dictionary and of the AVP Dictionary used by the Diameter Server</p> <p>See page [225]</p>
Offline	Billable Items (BIT) are massively transmitted to the SAP ERP system as the results of the rating,	Depends on the following variants:

	charging, rerating, and refilling functions Different variants are available: <ul style="list-style-type: none"> ■ Offline acquisition from connected system ■ Offline acquisition from repository (file, database) 	<ul style="list-style-type: none"> ■ The implementation is a Java development and system configurations of the BART Server ■ System configurations of the BART Server and of the IEC See page [201]
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List of Implementation Activities

The following activities may be scheduled for integrating SAP Convergent Charging 3.0 in your landscape:

Software Component	Implementation Tasks	Development	Integrated Scenario (*)
Core Server	Determining the sizes of the data caches	-	
	Implementing the notification handler	Integration Java technology	N/R
	Implementing the Chargeable Item Acquisition (Online Charging)	Integration Java technology	Relevant
	Implementing the Refill Item Collection	Integration Web Services	N/R <i>Available by default</i>
	Pricing and Modeling of charging master data for the Service Provider	Data configuration	Relevant
	Implementing the Customer Master Data Provisioning (Subscriber Accounts)	Integration Web Services or Java technology	N/R
	Implementing the Customer Master Data Provisioning (Provider Contracts)	Integration Web Services	N/R <i>Available by default</i>
	Implementing the Customer Master Data Provisioning (Subscription and Accesses)	Integration Java technology	N/A
	Setting up the default field mapping between CIT and BIT	System configuration	Relevant
	Implementing the rerating function	Integration Java or other technology	N/R <i>Available by default</i>
BART Server	Acquiring CDRs	Integration Java technology	

	Implementing the supervision function		
Diameter Server	Setting up the Service Dictionary	System configuration	
	Setting up the AVP Dictionary	System configuration	
Communications Taxing Server	n/a	n/a	
IEC	Implementing the Java Classes for adding functions	Yes	

All these tasks are described in this document.



NOTE (*)

When a scenario is integrated with SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite, most of the implementation activities are not relevant.

Data Customization Activities

The following table lists the data customization activities that you can perform after installing your landscape. *SAPInst* applies the relevant settings according to the options selected during the installation.

Customized Data	Configuration Tool	Procedure	Condition for a Development Landscape	Quality Assurance or Production Landscape
SAP Users	Core Tool	[51]	Mandatory	Mandatory
Public Holidays	Core Tool	[75]	Not relevant <i>The default settings are enough</i>	Mandatory
ISO Currencies	Core Tool	[88]	Not relevant <i>The default settings are enough</i>	Mandatory
SAP Currencies (*)	Core Tool	[150]	Not relevant <i>The default settings are enough</i>	Mandatory
VAT Tax Rates	Setup Tool	[86]	Not relevant <i>The default settings are enough</i>	Mandatory
EZTax (Tax Rates)	Setup Tool	[86]	Not relevant <i>The default settings are enough</i>	Mandatory if the US taxes are managed on the

				landscape
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**NOTE (*)**

Customizing certain data are only relevant in a scenario integrated with SAP CRM and SAP ERP/FI-CA, components of the SAP Business Suite.

4 Core Server Configuration of the Technical Features

This chapter lists the system configurations of the SAP CC 3.0 Core Server.



NOTE

The SAP CC 3.0 Core Server system checks the consistency of the system parameters at startup. Before to change the value of a system parameter, verify the constraints that apply. Consult the *System Parameter Reference* documentation for detailed information, see page [37].

System Settings for the License Management

SAP Convergent Charging 3.0 is protected by licenses. A license key file is necessary for each host machine of your system landscape. At the time of installation, temporary licenses can be set up and must be replaced by valid license keys.

Applying for the Permanent License

Use

To obtain a permanent license key, see  <http://service.sap.com/licensekey>  on SAP Service Marketplace.

When applying for a permanent license, you need to indicate the hardware key for each machine hosting an instance of the Core Server. The hardware keys are written in a file called `hardware_keys.txt` stored in one of the following directories on any host:

- `<drive>:\usr\sap\<SYSTEM_ID>\SYS\profile\` (MS Windows)
- `/usr/sap/<SYSTEM_ID>/SYS/profile/` (UNIX)

Installing the Permanent License

Use

To install the permanent license, you must use the [Setup Tool](#) on any machine hosting a dispatcher instance.

Procedure

- Go to one of the following directories:
 - `<drive>:\usr\sap\<SYSTEM_ID>\CCD<instance_number>\script` (MS Windows)
 - `/usr/sap/<SYSTEM_ID>/CCD<instance_number>/script/` (UNIX)

Where `<instance_number>` is the number automatically assigned to the Dispatcher instance by the system

- Type the following command: `setup license import <license_file>`

Where `<license_file>` is the path to the file containing the license

System Settings for the Java Virtual Machine

SAP Convergent Charging 3.0 must accommodate hardware which ranges from a basic laptop up to 64-CPU machines. The default values that are used in the setups are very low so that the system can be installed on a small configuration without being modified.

The default values are usually not suitable for a production environment. The memory allocated to the JVM must be customized for each instance to ensure high-level performance.



CAUTION

Do not use the default settings of the JVM options in a productive system landscape.

Setting up the JVM Options of an SAP CC 3.0 Core Server System

Use

The default memory settings set at installation time are not compliant with a quality or production SAP CC system. You must set up some JVM options relating to the SAP CC 3.0 Core Server system.

SAP AG provides you with some validated recommendations in a *SAP Note 1536317: JVM Options Recommendations for SAP Convergent Charging*.



RECOMMENDATION

Before installing a quality or production system, refer to the important *SAP Note 1536317: JVM Options Recommendations for SAP Convergent Charging*. You can find the latest version of the note on SAP Service Marketplace at: ► <https://service.sap.com/notes> → SAP Notes Search → Number → [1536317](#) ↵.

Prerequisites

- You have determined the options relevant in your system landscape.
- Refer to the *SAP Note* about the recommended settings.

Procedure

Refer to the *SAP Note* about the procedures to set up the JVM options in the `jstart.config` configuration file of each instance of the SAP CC Core Server system.

Setting up the Memory for the Rater Instances

Use

To set large value for the data caches of SAP CC 3.0, you need to set the JVM command line option: – **XX:MaxDirectMemorySize=<Max usable memory on the host machine dedicated to this instance>**

When several instances of the Core Server are installed on the same host in your system landscape, split the available memory.

**CAUTION**

The memory set for the data caches must not exceed the value of `MaxDirectMemorySize`; otherwise, the process causes an `OutOfMemory` error.

**RECOMMENDATION**

Before installing a quality or production system, refer to the important *SAP Note 1536317: JVM Options Recommendations for SAP Convergent Charging*. You can find the latest version of the note on SAP Service Marketplace at: ► <https://service.sap.com/notes> → SAP Notes Search → Number → [1536317](#) ◀.

Procedure

- Determine the appropriate memory sizes
- In each subfolder of the `/usr/sap/<SID>/SYS/profile/jstart/folder`, edit the `jstart.config` file and change the `-XX:MaxDirectMemorySize` parameter to the relevant value

System Settings for Data Cache Management

SAP Convergent Charging 3.0 uses data caches for optimizing all the processes and increasing performance.

Setting up the Cache Sizes

Use

After installing the production landscape, you must change the values of the data cache sizes to take into account the business traffic supported by SAP CC 3.0.

The memory set for the caches must not exceed the value of `MaxDirectMemorySize`; otherwise, the process causes an `OutOfMemory` error.

Prerequisites

These sizes have been determined on a test platform during the implementation phase (see the implementation section in this chapter).

Procedure

- Launch the SAP CC [Admin+ Tool](#)
- Log on as administrator
- For each Updater instance of the Core Server
 - Change the value of the `SUBSCRIPTION_CACHE_SIZE` parameter according to the cache sizing results
- For each Guider Instance
 - Change the value of the `GUIDING_CACHE_SIZE` parameter
- For each Rater instance
 - Change the value of the `SUBSCRIPTION_CACHE_SIZE` parameter
 - Change the value of the `SESSION_MEMORY_SIZE` parameter when applicable
- Restart all the instances of the server

**NOTE**

For setting the sizes of the caches, you can:

- Use a number immediately followed by k or K for kilobytes, m or M for megabytes, and g or G for gigabytes
- Or use a number without letters to express the size in bytes

Advanced: Enabling the Cache Warm-Up Function

Use

SAP CC 3.0 can preload data related to the end customers to increase performance of charging services. Do not enable this function on a production landscape without validations on a quality control landscape.

You need to partially restart the SAP CC Core Server system.

Consult the *Technical Reference Guide* for more information about cache warm-up mechanism.

Default Settings

This function is disabled.

Prerequisites

- You want to optimize the performance of charging services
- You have determined the appropriate settings for the cache warm-up function

Procedure

- Launch the SAP CC [Admin+ Tool](#)
- Connect to the Core Server with the `host` command
- Log on as administrator with the `user` command
- Change the `CACHE_WARMUP_THREAD_COUNT` parameters to the relevant values
- Change the `SQLHELPER_CONNECTION_COUNT` parameters to the relevant values
- Restart all the guider instances
- Restart all the rater instances

Settings for the User Management

SAP Convergent Charging 3.0 allows you to manage the profile of each SAP user and their roles or rights. You can also configure the rules for changing passwords.

Consult the *Security Guide* of SAP CC 3.0 directly on SAP Service Marketplace at: ►

<https://service.sap.com/instguidescc> → SAP CC 3.0 → *Install* ⚡ for user management information.

Enabling/Disabling the Security Policy for the Users

Use

SAP CC 3.0 allows you to configure and apply a security policy for managing the user passwords. By default, this function is enabled at the time of installation.

Procedure





- Launch the SAP CC [Admin+ Tool](#)
- Connect to the Core Server with the `host` command
- Log on as administrator with the `user` command
- Change the `PASSWORD_MANAGEMENT_ENABLED` parameter to true or false

- If you enable this function, configure the security policy for user passwords.

Setting up the Security Policy for the User Passwords

Use

You can configure all the security parameters by taking into account the global recommendations of SAP presented on SAP Service Marketplace at: ► <https://service.sap.com/security> ◀.

Processing Mode	Value
Password Mandatory	Passwords are always mandatory
Password Different from Login	The password must be different from the login (user name)
Password Minimum Length	<p>You can specify the minimum length allowed for the passwords. Only positive integer values are allowed.</p> <p> NOTE The value 0 means that there is no lower limit to the length of the passwords.</p>
Password Complexity	<p>You can specify the type of characters that must be present at least once in the password. It is possible to force the use of upper case letters, lower case letters, digits and special characters.</p> <p>Parameter format: It consists of a list of comma-separated values whose values are "uppercase", "lowercase", "digit", and "special"</p> <p> NOTE An empty list means that there is no restriction on the complexity of the password.</p>
Password Failed Login Limit	<p>You can specify the maximum number of failed logins allowed beyond which the user is locked and cannot be used anymore until an administrator unlocks it</p> <p> NOTE The value 0 means that there is no limit to the number of times a user can enter a wrong password.</p>
Password Duration Limit	<p>You can specify the time limit of the expiration period (in days) of a password beyond which it is expired and must be changed</p> <p> NOTE The value 0 means that there is no expiration delay for the passwords, and they do not need to be changed.</p>

Procedure

- Launch the SAP CC [Admin+ Tool](#)
- Log on as administrator
- Change the security parameters according to your security strategy

Setting up the SAP Users

Use

SAP CC 3.0 is protected by dedicated login/password management functions. You must set up such SAP users and configure their roles by using the Core Tool.



NOTE

You must also create users for the network elements or service applications that communicate with SAP Convergent Charging (mediation system and CRM). If you have installed the BART Server, you must create a user.

Consult the online Help of the Core Tool in the SAP Help Portal at: <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool*. You can access to the online Help from the graphical user interface.

Procedure

- Launch the Core Tool
- Log on as administrator or user administrator
- Create the users and assign roles

Resetting the Emergency User (Advanced Procedure)

Use

If you have incorrectly configured user management in emergency situations and if you can no longer log on to any applications, you can re-activate the emergency user for SAP CC 3.0.

Procedure

This emergency procedure resets the default user 'admin' with the password 'admin' and resets the administrator privileges in the database of SAP CC 3.0.

- Connect to the database with sufficient privileges to modify the tables in the schema used by SAP CC.
- Use the following SQL queries:

```
DELETE FROM USER_PASSWORD WHERE USER_OID = 1;
DELETE FROM USER_RIGHT WHERE USER_OID = 1;
DELETE FROM HCI_USER WHERE OID = 1;
INSERT INTO HCI_USER (OID, LOGIN_ID, PASSWORD, PASSWORD_CHANGE_DATE, FAILED_LOGIN_COUNT,
LOCKED, IS_HUMAN, CHANGE_PASSWORD)
VALUES (1, 'admin', '6989cd27e1ebb4d8f266d5c09469989f1caae07', NULL, '0', '0', '1', '1');
INSERT INTO USER_RIGHT(USER_OID, USER_RIGHT) VALUES (1, 'admin');
INSERT INTO USER_RIGHT(USER_OID, USER_RIGHT) VALUES (1, 'useradmin');
INSERT INTO USER_RIGHT(USER_OID, USER_RIGHT) VALUES (1, 'csr');
INSERT INTO USER_RIGHT(USER_OID, USER_RIGHT) VALUES (1, 'marketing');
INSERT INTO USER_RIGHT(USER_OID, USER_RIGHT) VALUES (1, 'bartadmin');
INSERT INTO USER_RIGHT(USER_OID, USER_RIGHT) VALUES (1, 'connectoradmin');
```

Setting up the User Work Session Management

Use

Working with one or more sessions can be managed by SAP CC 3.0 for the users connected to a graphical user interface. You must configure this function by defining the number of allowed connections to the same GUI and the time limit for a work session.

Procedure

- Launch the SAP CC [Admin+ Tool](#)
- Log on as administrator
- Change the USER_SESSION_ENABLED parameter to the appropriate value
- Change the values of the USER_SESSION_SESSION_LIMIT_PER_USER_AND_TOOL and the USER_SESSION_VALIDITY_PERIOD parameters



CAUTION

For resetting a working session that has failed, launch the SAP CC [Admin+ Tool](#).

System Settings for Logging and Tracing

SAP Convergent Charging 3.0 provides you with functions for logging (SAP CC system administrator) and tracing (support specialist).

Setting up the Logging and Tracing Function

Use

SAP CC 3.0 provides a unique function to manage:

- Logs that are mainly addressed to an administrator of a customer system
- Traces that are mainly addressed to the developer and the support organization



Administrators are usually not interested in the details of the software architecture and the organizational structure of SAP software but are interested in areas relating to their administration tasks. However, the developers working in an implementation project team want to monitor the details of the control flow.

- Consult the *Security Guide for SAP CC 3.0* about logs to determine your policy and concepts (see all the documentation references, page [37]).
- For more technical information, consult the *Parameter Reference* about the Audit and Log group in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → *Parameter Reference* ◀. See the [LOG_LEVEL parameter](#) and the other relevant parameters:
 - LOG_CONSOLE
 - LOG_ERRORFILE_NAME
 - LOG_FILE_BACKUPS
 - LOG_FILE_NAME
 - LOG_FILE_SIZE
 - LOG_LEVEL

- LOG_PRINT_THREADNAME_ENABLE

**NOTE**

The *Parameter Reference* document is available:

- In the Software Development Kit (SDK) of SAP CC Core Server
- On SAP Service Marketplace at the following location:  <https://service.sap.com/instguides> → SAP Business Suite Applications → SAP Convergent Charging → SAP CC 3.0 → Install .

Default Settings

The log function is enabled. The log level is set to `inform`.

**CAUTION**

Do not use a debug configuration for a production landscape with the SAP CC 3.0 Core Server system.

Activities

- Define your policy and concepts for the log management
- Determine the appropriate configuration parameters for the different types of instances of the SAP CC Core Server system
- Apply your policy by configuring the SAP CC system with the SAP CC [Admin+ Tool](#) for immediate and permanent changes

Procedure (Immediate Changes)

- Launch the SAP CC [Admin+ Tool](#) and log on
- Set up the new level for logs with the command and apply immediately and permanently this change:
 - `set log_level <NEW_LOG_LEVEL> all all`

System Settings for Communications

At the end of the installation time, the initial communication settings of SAP Convergent Charging 3.0 are stored in the SAP CC Core Database in an instance map.

The tree communication interfaces of SAP CC are available for external systems:

- Messae TCP
- Web Services (WS)
- Http Communication Interface (HCI)

SAP CC provides the following communication access points that must be accessible trough a firewall:

Access Point	Technical Interface	Business Function	Example
Dispatcher,HCI	<i>Http Communication Interface</i>	<ul style="list-style-type: none"> ■ Authentication (HCI) ■ Administration 	<ul style="list-style-type: none"> ■ SAP CC Core Tool ■ SAP CC Admin+ Tool
Dispatcher1,tcp	<i>Message TCP</i>	<ul style="list-style-type: none"> ■ Charging Services ■ Notification 	<ul style="list-style-type: none"> ■ SAP CC BART Server ■ External mediation system
Updater1,HCI	<i>Http Communication Interface</i>	<ul style="list-style-type: none"> ■ Master Data <ul style="list-style-type: none"> ● Service Provider ● End Customers 	SAP CC Core Tool
Updater,WS	<i>Web Services</i>	<ul style="list-style-type: none"> ■ Mater Data <ul style="list-style-type: none"> ● Service Provider ● End Customers ■ Refill Services 	<ul style="list-style-type: none"> ■ CRM application ■ Provisioning system ■ Billing system

Setting up the Instance Map

Use

The SAP CC 3.0 Core Server system uses and updates a complete list of the instances that are forming the system. This list includes the communication settings and a status for each declared instance. This instance map is also used by distant systems when high availability is required. You can main this map in case of network, hardware, or security changes.



EXAMPLE OF INSTANCE MAP

System Instance	Hostname	HTTP (Public)	EXTERNAL (Public)	INTERNAL (Private)	Current Date, Start Date	Status
dispatcher#1	...	HCI@http://aa.bb.ccc.ddd:9100 (HCI)	tcp://aa.bb.ccc.ddd:2000 (Message TCP)	tcp://aa.bb.ccc.ddd:4060	...	ON (master)
guider#1	ON
rater#1	ON
updater#1	...	HCI@http://aa.bb.ccc.ddd:9000 (HCI) WS@http://aa.bb.ccc.ddd:9109 (Web Services)			...	ON

Instance map

Procedure

- Export the *instance map* of the SAP CC Core Server system by using the [Setup Tool](#) (see page [\[31\]](#))
 - `setup instancemap export current_instance_map.csv`
- Copy and rename this file to `new_instance_map.csv`
- Edit this new configuration file and change the configurations:
 - Hostnames
 - HTTP access points for Web Services and HCI technical interfaces
 - Communication ports
- Import the new instance map:
 - `setup instancemap import current_new_instance_map.csv`
- Restart the system

Setting up the HTTP/HTTPS Connections**Use**

The SAP CC 3.0 Core Server system uses HTTP or HTTPS connections to communicate with external systems and the following technical interfaces:

- Web Services (SOAP messages)
 - For the Updater instances
- HTTP Communication Interface (HCI) for proprietary XML messages
 - For the Updater instances
 - For the Dispatcher instances

The same system settings are used for both technical interfaces.

To connect to the Core Server system, the following applications or systems must use the communication settings:

- SAP CC Core Tool
- SAP CC BART Server system
- CRM application
- External provisioning system

You can maintain the settings of these communications for a development landscape.

Default Settings

HTTP Secured (HTTPS) connections are set up.

**NOTE**

These settings may have been changed at the installation time. See the *Installation Guide* for details.

Prerequisites

- If you want to enable secured HTTP connections, private keys and associated certificates must already exist in the Core Database

Procedure

- Export the *instance map* of the SAP CC Core Server system by using the [Setup Tool](#) (see page [\[31\]](#))
 - `setup instancemap export current_instance_map.csv`
- Copy and rename this file to `new_instance_map.csv`
- Edit this new configuration file and change the configurations of all the Updater instances and all the Dispatcher instances of the Core Server system:
 - HTTP Port Number
 - HTTP Host
 - HTTP Secure
- Do not change the value of the HTTP Secure parameters to true if you have not first generated and installed the necessary private keys and their associated certificates (see the next procedures)
- Import the new instance map:
 - `setup instancemap import current_new_instance_map.csv`
- Restart the Updater and the Dispatcher instances of the Core Server system



NOTE

If you enable HTTPS connections and create certificates for SAP CC Core Server system, you must change the communication and security settings of all the applications and systems interfaced with the Core Server. They must accept the certificates. For example, you must configure the SAP CC Core Tool, SAP CC BART Server system, and a CRM application.

Enabling the Secured HTTP Connections

Use

You can change or enable the secured HTTP connections. You need to generate private keys and their associated certificates. A unique certificate can be used for all the instances of the SAP CC Core Server system, but you can also generate different certificates for each host machine of the Core Server system.

The connected applications or systems must share the public certificates.

Consult the *Installation Guide* to generate private keys and associated certificates for the HTTPS connections.

Activities

- Generate the private keys and their associated public certificates
- Install the keys/certificates in the SAP CC Core Server system
- Enable the HTTPS connections
- Share the public certificate(s) with the connected applications or systems

Installing the Private Keys and Certificates

Use

To use HTTP Secured (HTTPS) connections, the private keys and associated public certificates must be uploaded to the SAP CC Core Server system.

**NOTE**

These private keys and associated certificates are physically uploaded to the Core Database of the SAP Convergent Charging.

Prerequisites

- The private keys and public certificates have been generated in files
- The SAP CC Core Server system is up and running
- The Core Database is up and running
- You have an SAP User with an administrative role

Procedure

To install the private keys and their associated certificates in the SAP CC Core Server System:

- For each host machine of the Core Server System:
 - Import the private key and the associated certificate for the host into the SAP CC Core Database by using the [Setup Tool](#) (see page [31]) (each `alias` must be unique for the complete landscape):

```
setup keyentry import <alias> <private_key_file> <certificate_file>
```

- Enter the logon and password of your SAP User declared in SAP CC
- Identify all the Dispatcher and Updater instances present in this host
- Link the key/certificate pair to the Dispatcher and Updater instances of the host:

```
setup keyentry link <alias> <instance1_ID>,<instance2_ID>,...,<instanceN_ID>
```

**NOTE**

A simplified procedure is available for development, training, or test landscapes using only one host machine:

- Import the private key and the associated certificate:
`setup keyentry import <alias> <private_key_file> <certificate_file>`
- Link the key/certificate pair to all the instances of the system:
`setup keyentry link <alias> all`
- Restart the Updater and Dispatcher instances of the SAP CC Core Server System

Result

You can share the certificate files with connected applications and systems.

**EXAMPLE (TWO HOST MACHINES)**

Use the Setup Tool command program to manage the keys and their associated certificates:

```

setup keyentry import keyhost1 myprivatekey1file mycertificatelfile
setup keyentry link keyhost1 dispatcher#1,updater#1
setup keyentry import keyhost1 myprivatekey1file mycertificatelfile
setup keyentry link keyhost2 dispatcher#2,updater#2

```

Setting up the Communications via the Web Services

Use

SAP CC 3.0 provides a *Web Services* interface based on SOAP and HTTP standards. You can maintain the system settings for the Updater instances of the SAP CC Core Server.

Default Settings

- The Web Services are available
- The HTTP port number and the identifier of the host were configured with *SAPinst*
- The encryption of the HTTP connections is activated

Activities

- Consult the *Security Guide for SAP CC 3.0* on the security management relating to the web services interface and on the user management
- Create the necessary SAP users for these communications
- Set up the HTTP connection information for the Web Services (see below)
- Set up the encryption of the HTTP connections

Disabling up the UDP Discovery Function (Postinstallation)

Use

By default, SAP CC 3.0 uses a discovery function based on the UDP protocol for detecting the available Dispatcher instances of the Core Server. If the network configuration does not permit this function, you can manually declare and maintain the list of available Dispatcher instances.



CAUTION

Before doing the changes, you must stop all the instances of the Core Server of SAP Convergent Charging.

Default Settings

The UDP Discovery Function is enabled.

Procedure

- Stop all the instances of the Core Server
- Identify all the Dispatcher instances and their URL and port
- Edit all the boot.config files related to each installation of an instance and which are in one of the following folders:
 - <drive>:\usr\sap\<SYSTEM_ID>\<INSTANCE_TYPE>\<INSTANCE_ID>\config\boot.config (MS Windows)
 - /usr/sap/<SYSTEM_ID>/<INSTANCE_TYPE>\<INSTANCE_ID>/config/boot.config (UNIX)
- Change the value of the BOOT_DISPATCHER_LIST parameter by inserting the URL and port of the Dispatcher instances
- Remove the values of the following parameters:
 - **DISCOVERY_MULTICAST_ADDRESS**

- **DISCOVERY_PORT**
- Restart the Master Dispatcher instance
- Restart the other Dispatcher instance(s)
- Restart the other instances of the server

System Settings for the Database Communication

Resetting the Login and Password for the Database (Advanced Procedure)

Use

For test or development purposes, you can change the login and password of the database after installing SAP CC 3.0.

In a production landscape, you must avoid using this procedure.



CAUTION

Before doing the changes, you must stop all the instances of the Core Server system of SAP Convergent Charging.

Procedure

- Launch the SAP CC [Admin+ Tool](#) and log on
- Set the login and password for the database with the commands:
 - `set SQLHELPER_LOGIN <new login> all`
 - `set SQLHELPER_PASSWORD <new password> all`
- Stop all the instances of the Core Server system
- Identify the installation folder(s) of all the Dispatcher instance(s)
- Edit the login/password declaration stored in the boot.config file related to each installation of a Dispatcher instance and which is in one of the following folders:
 - `<drive>:\usr\sap\<SYSTEM_ID>\CCD<INSTANCE_ID>\config\boot.config` (MS Windows)
 - `/usr/sap/<SYSTEM_ID>/CCD<INSTANCE_ID>/config/boot.config` (UNIX)
- Change the values of the following parameters:
 - **SQLHELPER_LOGIN**
 - **SQLHELPER_PASSWORD** (the value will be encrypted when the Dispatcher instance restarts)
- Restart the instances of the Core Server

Settings for Time Zones and Dates

System Customization: Setting up the Time Zone and Date Management (Implementation)

Use

The applications of SAP CC 3.0 manage all the dates in local time. When it is needed by your business, the connected systems and the architecture of the landscape manage the conversion of the required date formats from and to SAP CC 3.0.

Activities

When it is relevant, the implementation must take into account the management of the time zones outside SAP CC 3.0. The following data are available:

- Incoming data:
 - Master data: Provider contracts, subscriptions, and subscriber accounts
 - Transactional data: Chargeable items or refill items (Core Server), CDRs (BART Server), and CCRs (Diameter Server)
- Outgoing data:
 - Master data: Offers, charges, charge plans, and refill plans
 - Transactional data: Charged items, refill records, billable items, rated transactions, charged transactions, and CCAs (Diameter Server)

System Settings for the System Landscape Directory

The SAP Convergent Charging 3.0 Core Server can send information about installed hardware and software components of your system landscape. It updates regularly the System Landscape Directory of SAP NetWeaver (SLD).



NOTE

For more information about System Landscape Directory of SAP NetWeaver, consult the documentation in SAP Help Portal at: <http://help.sap.com/nw70> → SAP NetWeaver 7.0 → SAP NetWeaver 7.0 Library (English) → SAP NetWeaver Library → SAP NetWeaver by Key Capability → Solution Life Cycle Management by Key Capability → Software Life Cycle Management → [System Landscape Directory](#) ↩.

Enabling the SLD Data Supplier Function

Use

The SAP CC Core Server can regularly send information data to the System Landscape Directory (SLD).

Default Settings

By default, this function is not enabled by *SAPInst*.

Prerequisite

- A SLD server is up and running.
- The Component Repository Content (CR Content) in the System Landscape Directory (SLD) is up to date (see SAP Note [669669](#)).

Procedure

- Launch the SAP CC [Admin+ Tool](#)
- Connect to the Core Server system with the `host` command
- Log on as an administrator with the `user` command
- Change the `SLD_SCHEDULER_ENABLED` parameter to `true`
- Set up the other relevant parameters as described in the next section
- Restart all the Dispatcher instances of the Core Server system

Setting up the SLD Data Supplier Function

Use

You must manually configure the SAP CC Core Server to connect to the SLD and send data periodically. You can define the communication settings and the time period between two updates of the SLD.

Prerequisites

- A SLD server is up and running
- The Component Repository Content (CR Content) in the System Landscape Directory (SLD) is up to date (see SAP Note [669669](#))
- The SLD data supplier function is activated in the Core Server system

Procedure

- Launch the SAP CC [Admin+ Tool](#)
- Connect to the Core Server system with the `host` command
- Log on as an administrator with the `user` command
- Change the communication and scheduling parameters to the appropriate values:

Communication Parameters	
SLD_URL	The full and valid URL of the SLD server Ex.: Error! Hyperlink reference not valid. <code>http ://<SLD_HOST>:<SLD_PORT>/sld/ds</code>
SLD_USER	The username to log on to the SLD server for authentication
SLD_PASSWORD	The password for the username needed for authentication

Scheduling Parameter	
SLD_SCHEDULER_RECURRENCE	Recurrence pattern for the scheduler in charge of sending updates to the System Landscape Directory (SLD) By default this parameter is set to every day at 1:00 AM

- Restart all the Dispatcher instances of the Core Server



NOTE

Consult the *Parameter Reference* for more information about the syntax relating to the value of the [SLD_SCHEDULER_RECURRENCE parameter](#). It is available in the Software Development Kit (SDK) or on SAP Service Marketplace at the following location: ► <https://service.sap.com/instguides> → SAP Business Suite Applications → SAP Convergent Charging → SAP CC 3.0 → Install ◀.

System Settings for Publishing Notifications (Business and System Alerts)

SAP Convergent Charging 3.0 features notifications and alerts at business and administrative levels that allow you to monitor events and receive alerts or notifications when these events occur. The

notifications are sent via the *Message* technical interface. SAP CC 3.0 provides a framework based on Java APIs for implementing this feature in your client application (provisioning system, billing system, and SMS gateway).

The event types are organized into Notification Groups, and the notifications are configured in the Notification Policy which is configured in an XML file that must be imported into the database.

Overview of the Function

Notification Groups

The event types that generate notifications are defined in the following notification groups:

- **ABM Group:** During the rating and charging functions related to an usage of a marketable service by a customer, SAP CC triggers Account Balance Management (ABM) notifications when:
 - The balance of a prepaid account or of a credit limit goes below a specified threshold
 - Or when a prepaid account has expired



NOTE

For test or training purposes, you can use the Core Tool to configure the alerts which are part of the subscriber account settings (refer to the [Core Tool online Help](#) for more information about the alert settings related to credit limit balances and prepaid accounts).

- Or when an alert has been set up in the price plan or the charging plan of a charge activated in a provider contract or a subscription (by using the [Alert Triggering Operator](#)).
- **Administrative Group:** It triggers administrative notifications related to the connections between the systems (for example, database, and instances of the Core Server).

Notification Policy

An administrator can define the rules to publish notifications by setting up a notification policy. This policy defines:

- The filters that can be applied to limit the internal events that will generate a notification
- The outputs for these notifications

Notification Output

The network notification service is used for publishing both the ABM notifications and the administrative notifications. The notifications are sent via the technical interface *Message* that is based on TCP/IP. Your application can handle these notifications by implementing the Java framework.



NOTES

- Consult the *Technical Reference Guide* for more information about the BARBus

communication layer (see page [\[37\]](#)).

- In a scenario integrated with SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite, some publications are extended to the JCo interface.
- The notification function is provided by the Core Server of SAP CC. The BART Server provides other mechanisms.

Implementation Project

You need to use the Java Libraries provided with SAP CC 3.0 and its `com.highdeal.notification` Java package to implement the handling of notifications in your application system. A Software Development Kit (SDK) includes these libraries and the relevant documentation.

The implementation project is detailed in the next Implementation section.

Function	Technical Interface	Software Units	Technical Operation or API
Handling of Notifications	Java	Core SDK	Java Package: <code>com.highdeal.notification</code> Java Class: <code>NotificationHandler</code>



NOTE

For more details, consult the *Javadoc* of the Core SDK (see page [\[37\]](#)).

Notifications

ABM Notifications

The Account Balance Management (ABM) notifications are described in the following table:

Notification Name / ID	Level	Scope	Description
Amount alert (ID: 0)	inform	Prepaid account or a credit limit balance	<p>Thrown when an amount alert is triggered, that is, when a prepaid account or a credit limit balance goes below the amount threshold of the alert</p> <p>The following information is provided:</p> <ul style="list-style-type: none"> ■ The service provider of the subscriber account ■ The ID (code) of the subscriber account ■ Is "prepaid" or "creditLimit" if the related balance is a prepaid account or a credit limit balance ■ The ID (code) of the balance for which an amount alert has been triggered ■ The current amount of the balance with its currency ■ The message of the alert as configured in the subscriber account ■ The amount threshold of the alert <p>These alerts are configured for each subscriber account by the external CRM or the provisioning system during the</p>

			customer data provisioning process.
Expiration alert (ID: 1)	inform	Prepaid account	<p>Thrown when the expiration alert of a prepaid account is triggered</p> <p>The following information is provided:</p> <ul style="list-style-type: none"> ■ The service provider of the subscriber account ■ The ID (code) of the subscriber account ■ The ID (code) of the balance for which an amount alert has been triggered ■ The message of the alert as configured in the subscriber account ■ The state related to the alert ■ The date when the state change occurs ■ The period when the alert is triggered around the change date <p>These alerts are configured for each subscriber account by the external CRM or the provisioning system during the customer data provisioning process.</p>
User alert (ID: 12)	inform	Price plan or charging plan	<p>Thrown when a user defined alert is triggered</p> <p>This message includes:</p> <ul style="list-style-type: none"> ■ The code that identifies the user alert ■ The message describing the user alert ■ The service provider of the subscriber account ■ The code of the subscriber account ■ A list of properties that gives additional information about the user alert <p>Use the Core Tool to configure your own alerts by using the Alert Triggering Operator in a reusable charge defined for the service provider.</p>

You can get the last list of notifications from the Core SDK in the [NotifBook](#) topic of the Core Javadoc.

Administrative Notifications

The following notifications can be sent by:

Notification Pretty Name / ID	Level	Availability	Description
Instance is up (ID: 2)	inform	common	The instance of the Core Server is running
Instance is Down (ID: 3)	inform	common	The instance of the Core Server was manually stopped

			This trap may not be sent when the instance crashes.
Database link is down (ID: 4)	failure	common	<p>The instance of the Core Server has lost its connection with its database</p> <p>There are several reasons:</p> <ul style="list-style-type: none"> ■ The database is stopped (accidentally or voluntarily) ■ The network interface is down ■ The instance cannot contact the database host because of a network problem (for example, the firewall configuration) <p>This trap is not thrown when the instance has been launched if the instance cannot contact the database because of a wrong configuration.</p>
Database link is up (ID: 5)	inform	common	The instance of the Core Server has opened new database connections
Database failure (ID: 6)	failure	common	<p>The database has returned a failure exception</p> <p>The argument “alertMessage” of the trap describes the reason of the problem.</p>
Out of memory (ID: 7)	fatal	common	<p>The instance of the Core Server has been stopped because its JVM has thrown an OutOfMemoryException</p> <p>The trap may not be sent because the JVM has not enough memory to process the trap.</p>
pnrShedulerWakesUp / 8	inform	common	<p>The Updater instance scheduler wakes up.</p> <p>The scheduler starts a new activation cycle.</p>
pnrShedulerSleeps / 9	inform	Updater instance	<p>The Updater instance scheduler sleeps.</p> <p>The Updater instance scheduler may be waiting for its next activation cycle.</p>
pnrShedulerInterrupted / 10	inform	Updater instance	<p>The Updater instance scheduler has been interrupted.</p> <p>The environment of the instance prevents the scheduler to complete its cycle (the activation has failed, there is a problem of memory, and so on).</p> <p>The argument “alertMessage” of the trap describes the reason of the interruption.</p>
authenticationFailure / 11	security	common	<p>An XML message has been received without a valid authentication (unknown login or wrong password)</p> <p>The argument “alertMsg” of the trap is set to “unknown login” or “wrong password”. It has also</p>

		one argument “alertData” set to the login (if specified) or set to “no login”.
--	--	--

You can get the last list of notifications from the Core SDK in the [NotifBook](#) topics from the Core Javadoc.

Setting up the Notification Policy Function

Prerequisites

The notification function has been implemented in your landscape by your project team and consultants.

Activities

To set up the notification policy, do the following:

- Define your notification policy concept
- Create the configuration file of the notification policy (xml format)
- Enable the function
- Restart the Core Server (all instances)

Defining a Concept for the Notification Policy

By default, all the notifications are sent. You must decide if you want to limit the notifications to a group (ABM, admin) and if you want to filter notifications.

Creating a Notification Policy Configuration File

Use

A configuration file (XML format) is used to define the notification policy. It includes a main XML element (`notificationPolicy`) that can include two nested elements: `filters` and `network`.

Nested Element	Nested Element	Attribute	Description
filters			
	all	accept (optional)	Enables/disables all the notifications The possible values are: <ul style="list-style-type: none"> ● true (default) ● false
	range	accept	Enables/disables the notifications with the ID belonging to a defined range [lower, upper] The possible values are: <ul style="list-style-type: none"> ● true ● false
		lower	Lower ID of the range
		upper	Upper ID of the range

	set	accept	Enables/disables a notification specified by its ID
		id	
	name	accept	Enables/disables the notifications by their name
		pattern	A regular expression about the name of the notifications
	prettyName	accept	Enables/disables the notifications by their pretty name
		pattern	A regular expression about the name of the notifications
	level	accept	Enables/disables the notifications by their level
		lowerLevel	Level values are: 'inform', 'warn', 'security', 'failure', and 'fatal'
network		groups	Specify the notification groups that send notifications The possible values are: <ul style="list-style-type: none"> ● abm ● admin ● abm,admin

Default Settings

A template configuration file is provided as an example.

Prerequisites

- You have determined a concept for the notification policy management.
- The notification function has been implemented in your landscape by your project team and consultants, and a Java based application can retrieve the notifications published by SAP CC on the network (see page [\[72\]](#)).

Procedure

To create a new configuration file:

- Copy the notification_policy.xml.sk template file from the configuration folder of the Core Server (/usr/sap/<SYSTEM_ID>/CCD<INSTANCE_ID>/exe/CC_CORE_SERVER/config/)
- Edit this new file and insert your settings according to the XML format
- Save the file in a work folder

Enabling the Notification Policy Function

Use

SAP CC 3.0 can regularly send notifications to connected Java applications. By default, this function is not enabled at the installation time.

Default Settings

- No notification is published by the SAP CC Core Server

- In the standard installation, *SAPinst* does not set up this function
- A template configuration file is provided as an example (see `notification_policy.xml.sk`)

Prerequisites

- You have created a configuration file for your notification policy.
- The notification function has been implemented in your landscape by your project team and consultants, and a Java based application can retrieve the notifications published by SAP CC on the network.

Procedure

To import your policy from a file:

- From a Dispatcher instance, start the Setup Tool and use the `notificationpolicy` command with the `import` option.

**EXAMPLE**

Enter the command: `notificationpolicy import <myfilename>`

- Restart all the instances of the Core Server

Implementation Tasks

Determining the Sizes of the Data Caches

Use

This *Customizing* activity explains how you can size these caches to optimize the functioning of the system. SAP CC 3.0 has three different caches which must be sized according to the volume of data (master data or transactional data):

- Subscription Cache
- Access Cache
- Rating Session Cache
 - This cache is not used if the Business Scenario does not use the session-based rating and charging services of SAP CC

These caches must include all the necessary data.

**NOTE**

Other caches such as the offer level cache exist but they are automatically sized. Consult the *Technical Reference Guide* for details about the cache structures.

You cannot guess the average size of the objects to be cached because the size is different for every SAP CC 3.0 platform. Therefore, the instances of the Core Server are first started with a predefined size, and the size of caches must be fine-tuned.

To determine the size of a cache, the best way consists in having a sample of objects contained in the cache and determine the average size of these objects.

The recommended method consists in simulating the presence of 1,000 end customers and creating all relevant and necessary business objects: 1,000 subscriber accounts, 1,000 provider contracts (or subscriptions), relevant pricing objects (charge plans, offers, and suboffers, charges with price plans, and charging plans including pricing macros or tier or translation tables) in the catalog of the service provider. This simulation is important and must model the future usage of the platform.

Prerequisites

- The SAP CC system is up and running
- You have determined a model for your *Business Scenario*

Activities

Size your caches manually by applying the following method for each cache type:

- Start an instance of each type (Dispatcher, Updater, Guider, Rater, and Taxer when relevant) with the default values for sizing the cache
- Write down the size S_1 and the free memory FM_1 for each cache and for each instance type
 - Launch the SAP CC [Admin+ Tool](#)
 - Connect to the Core Server with the `host` command
 - Log on as administrator with the `user` command
 - Use the `get` command with the following parameters: `SUBSCRIPTION_CACHE_SIZE`, `GUIDING_CACHE_SIZE` and `SESSION_MEMORY_SIZE`
 - Write down the current sizes of the data caches: Subscription cache, access cache (`GUIDING_CACHE_SIZE`), and rating session cache (`SESSION_MEMORY_SIZE`)
 - Use the `get` command with the following parameters: `SUBSCRIPTION_CACHE_FREE_MEMORY`, `GUIDING_CACHE_FREE_MEMORY` and `SESSION_FREE_MEMORY`
- Create N_o typical objects (about 1,000, for example) to be stored in the caches: Subscriber accounts, subscriptions or provider contracts, and accesses
- Restart all the instances of the Core Server
- Write down the size S_2 and the free memory FM_2 again
- Compute the memory needed for the newly created objects:
 - If the size of the cache has not changed, calculate the difference between the free memory size at the first launch and the free memory size at the second launch ($FM_1 - FM_2$).
 - If the size has changed, apply the following formula $(S_2 - FM_2) - (S_1 - FM_1)$.
- Divide the previous result by the number of objects you have created in the cache, and then multiply the result by the number of objects you plan to have in the future N_f .
- Add the result to the first computed size: You obtain the size of your cache
- Increase S_2 and the total size of the JVM with this number to prevent the memory for the cache from being taken by another cache or the JVM. See the following sections to know how you can modify the size of the caches and the memory for the JVM.
- To sum up, the cache size is estimated as follows:

$$\frac{FM_1 - FM_2}{N_o} * N_f$$

Or:

$$\frac{(S_2 - FM_2) - (S_1 - FM_1)}{N_o} * N_f$$

- Divide this result by the number of instances of the same type
- Use these values when configuring the production landscape

Considering the Cache Warm-Up

Use

In this *Customizing* activity, you determine if you need to activate the cache warm-up function to increase the performance of the charging services provided by the SAP CC 3.0 Core Server system.



CAUTION



The data cache warm-up function is mandatory with a HA setup.

Prerequisites

- The data caches have been sized (see previous topic) and the SAP CC system has been configured
- The hardware configuration has been adapted

Activity

Use the following table to make the decision:

Landscape Setup	Cache Warm-up Function	Description
High Availability (HA) <i>High availability is required for the online charging services provided by your SAP CC landscape</i>	Mandatory	In case of a crash of an instance of the SAP CC system, the cache warm-up function quickly preloads the necessary customer data.  NOTE Consult the <i>Technical Reference Guide</i> for more information about the HA feature.
Non HA	Recommended	We recommend that you enable the function.  NOTE It is highly recommended with SAP CC systems that are regularly restarted (on a daily basis for example).

Determining the Settings for the JVM Options

Use

In this *Customizing* activity, you determine the JVM options that are necessary for your SAP CC 3.0 Core Server system. This includes the configuration of the:

- Memory heap and garbage collector
- Direct buffers



RECOMMENDATION

Before installing a quality or production system during the implementation project phase, determine the necessary settings by referring to the important *SAP Note 1536317: JVM Options Recommendations for SAP Convergent Charging*. You can find the latest version of the note on SAP Service Marketplace at: ► <https://service.sap.com/notes> → SAP Notes Search → Number → [1536317](#) ◀.

Default Settings

- The default settings of the JVM options ensure a correct behavior of the SAP CC system installed on small machine.
- These default settings are not adapted to a quality or production system landscape.

Activities

- Define the configuration for the different types of instances of your SAP CC system.

Determining the Settings for the Cache Warm-up

Use

In this *Customizing* activity, you fine configure the SAP CC 3.0 Core Server system by setting up the number of running threads necessary to handle the cache warm-up function processed by each of the following system instances:

- Rater instances
- Guider instances

Prerequisites

You need to enable the data cache warm-up function (see previous topic)

Activities

- Define the configuration for the rater instances of the SAP CC system:
 - Determine the value of the `CACHE_WARMUP_THREAD_COUNT` parameter: It must be equal to the number of CPUs available minus one.
 - When necessary, increase the value of the `SQLHELPER_CONNECTION_COUNT` parameter
- Define the configuration for the guider instances:
 - Determine the value of the `CACHE_WARMUP_THREAD_COUNT` parameter: It must be equal to the number of CPUs available minus one.
 - When necessary, increase the value of the `SQLHELPER_CONNECTION_COUNT` parameter
- Validate this configuration
 - Set up the SAP CC system from the quality control landscape (See [Advanced: Enabling the Cache Warm-Up Function](#) on page [49])
 - Restarting the test system
 - Monitor the CPU and thread resources and the processing time of the executions of the warm-up mechanism

- Set up the SAP CC system from the production landscape

**RECOMMENDATION**

Consider the CPU resources of the machines hosting a rater instance or a guider instance of the SAP CC system. Set up the values of the `CACHE_WARMUP_THREAD_COUNT` parameters with the number of CPUs minus one.

Consult the *Sizing Guidelines* about the number of CPUs expected for the host machines dedicated to the SAP CC Core Server system.

**EXAMPLE**

You want to enable the data cache warm-up function.

Your landscape includes 8 CPU machines that host the rater instances and the guider instances of the SAP CC Core Server system. `CACHE_WARMUP_THREAD_COUNT` is set to 0 for both types of instances. `SQLHELPER_CONNECTION_COUNT` is set to 20 for the rater instances and to 8 for the guider instances.

Possible values for the system parameters are:

- Rater
 - `CACHE_WARMUP_THREAD_COUNT`: 7
 - `SQLHELPER_CONNECTION_COUNT`: 27
- Guider
 - `CACHE_WARMUP_THREAD_COUNT`: 7
 - `SQLHELPER_CONNECTION_COUNT`: 15

Implementing a Notification Handler in Your Java Application

Use

In this customization activity, you develop a client application based on Java to implement the notification handling function. From the Core SDK, you use the `com.highdeal.notification` package of the SAP CC 3.0 Java Libraries.

Perform the following steps to implement the notification handler for Balance Alerts in your Java application:

- Implement the `NotificationHandler` interface
- Instantiate the `NotificationServiceClient` object

**NOTE**

For more information see the SAP CC Java API Specifications (Javadocs) in the technical library from the Software Development Kit (SDK) or in the SAP Help Portal at the following location: ►

<http://help.sap.com/javadocs/cc> → SAP CC 3.0 → Core Server APIs → All Classes → [NotificationHandler](#) ◀.

Implementing the Notification Handler Interface

In this customization activity you develop your own notification handler by implementing the `com.highdeal.notification.NotificationHandler` interface. This interface has only one method invoked each time a notification is received:

```
void handleNotification(String clusterName,
                        int instanceID,
                        long timestamp,
                        int uid,
                        String... args);
```

In this method, you receive all the information about the notification:

- `clusterName` – the name of the cluster which the instance that has sent the notification belongs to
- `instanceID` – The id of the instance which has sent the notification
- `timestamp` – The date on which the notification has been sent
- `uID` – The unique identifier of the notification
- `args` – The arguments of the notification

To get the description of the notification, invoke the method:

```
NotificationDescription desc =
NotifBook.searchNotificationDescription(uid);
String notifName = desc.getName();
String notifPrettyName = desc.getPrettyName();
NotificationLevel notifLevel = desc.getSeverityLevel();
String[] notifArgNames = desc.getAdditionalInfoKeys();
```

This description contains the name, the pretty name, the level of severity, and the name of the arguments of the notification.



CAUTION

Note that the thread invoking the handler is the one listening on the socket. Thus, the thread must be quickly freed by using a thread pool to handle the received notification; otherwise, some notifications may be lost if the listening thread is busy.

Consult the Java classes `NotificationDescription` and `NotifBook` that are detailed in the package `com.highdeal.notification`.

Instantiating the Notification Service Client Object

In this customization activity you develop your Java application (client side).

Perform the following steps to instantiate your program:

- Instantiate a `NotificationHandler` object
- Instantiate an `InstanceMap` object with the `searchInstanceMap` method
- Instantiate a `NotificationServiceClient` object
- Initialize this client object with the `setNotificationHandler` and the `addAllConnections` methods
- Connect the client object to receive notifications

Your notification handler will be invoked each time an instance of the Core Server System sends a notification using the notification service.

**EXAMPLE**

```
NotificationHandler notifHandler = ...

InstanceMap map = NotificationServiceClient.searchInstanceMap(bootHostName, bootPort,
bootMode);

client = new NotificationServiceClient();
client.setNotificationHandler(notifHandler);
client.addAllConnections(map);
client.connect(null, 10000);
```

Results

- Your Java application can receive and handle the notifications sent by the SAP CC Core Server
- You can define a concept for the notification policy
- You can configure the Core Server System to enable the notification function with this policy
- For test purpose you can create prepaid accounts or credit limit balances in the subscriber accounts
- You can implement the provisioning function of end customer master data (subscriber account, prepaid account, credit limit balance) to define alerts based on amount threshold

**NOTE**

For more information about this configuration of master data for the end customers in SAP Convergent Charging, see the SAP CC 3.0 Library from SAP Help Portal at the following location: ► <http://help.sap.com/cc> → SAP CC 3.0 → Application Help → Core Tool → Subscriber Accounts → Prepaid Accounts → [Alerts](#) ◀.

5 Core Server Configuration of the Business Features

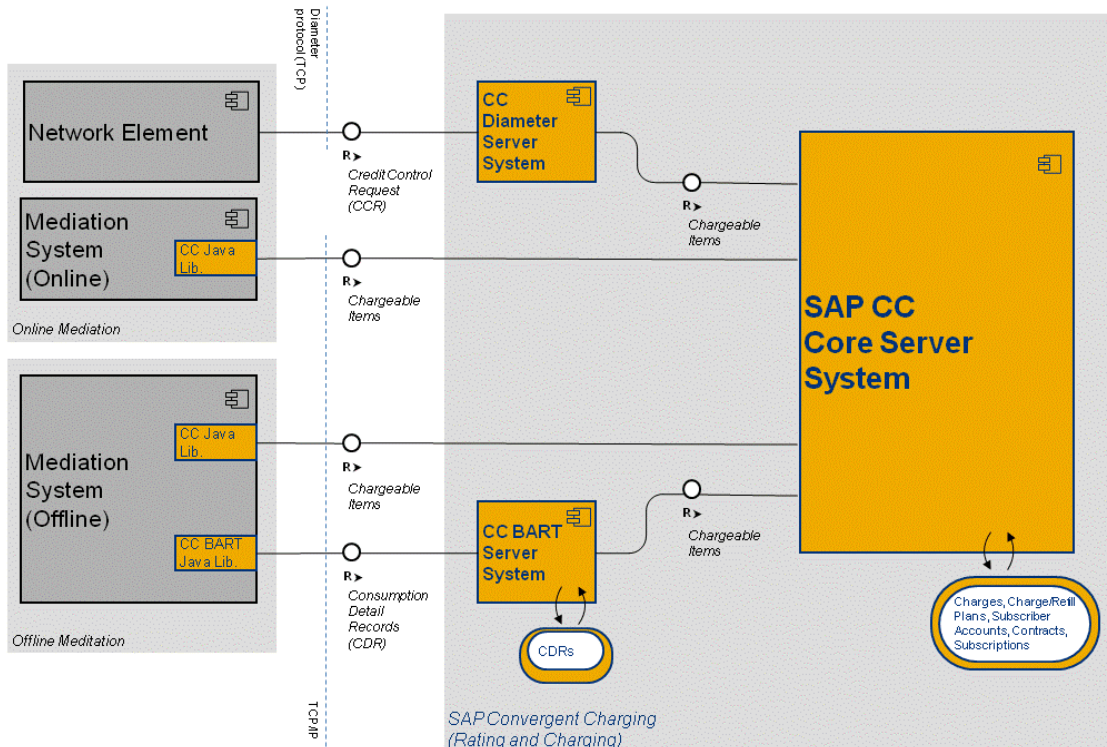
This chapter lists the system configurations of the SAP CC 3.0 Core Server.

Usage Online/Offline Acquisition and Data Collection Functions

Use

SAP Convergent Charging must receive consumption information data for a marketable service before charging the customer for the usage of this service. SAP CC can manage different sources of charging requests:

- Online Scenario:
 - Online Acquisition of Chargeable Items: See the section below to know how to customize your system with Java Libraries
 - Online Acquisition of Credit Control Requests (CCR) via Diameter protocol: See the Diameter Server configuration (see page [\[225\]](#))
- Offline Scenario:
 - Offline Acquisition of Consumption Detail Records (CDR): See the BART Server configuration (see page [\[201\]](#)) to know how to customize your system with Java Libraries



Consumption information data flow

**NOTE**

SAP CC can manage refill requests for prepaid accounts: See the section below to know how to customize your system with Web Services technical interface.

Chargeable Item Acquisition (Implementation Project)

Use

SAP CC 3.0 receives chargeable items from network elements or service applications for charging the usage of a customer service. These data records must include all the necessary elements for the charging process but also for the invoicing process. Some configuration activities are necessary during the implementation phase and before the installation.

**NOTE**

When the charging is in mode batch, the BART Server converts all the incoming CDRs into chargeable items and transmits them to the Core Server.

Activities

- According to your business scenario, determine the business service of SAP CC that you need for global charging or rating:
 - Charging
 - Session-based Charging
 - Blank Charging
 - Stateless Rating
- Specify the chargeable items (types and contents) that your network elements or the service applications will send to SAP CC depending on the customer services to be charged.
- Make sure that your architecture can manage time zones outside SAP CC 3.0
- Implement the generation and the transmission of chargeable items including information on local time date
- Set up the chargeable item classes in the Core Tool to model the price plans of charges to be applied on each usage [see [Setting up Chargeable Item Classes](#) on page [97]

Refill Item Acquisition (Implementation Project)

Use

SAP CC 3.0 can receive refill items from external systems (ERP or billing) for refilling a prepaid account. These refilling services are offered by the service provider in addition to the marketable services. These data records must include all the necessary elements for the refilling process but also for the invoicing and reporting process. Some configuration activities are necessary during the implementation phase and before the installation.

Consult the documentation for the Web Services of SAP Convergent Charging 3.0 in SAP Help Portal at: <http://help.sap.com/cc> → SAP CC 3.0 → Technical Interfaces ↵.

**NOTES**

- You can download the documentation on SAP Service Marketplace at: ►
<https://service.sap.com/instguidescc> → *SAP Convergent Charging* → *SAP CC 3.0* → *Plan* ◀.
- The documentation for the Web Services of SAP CC is also included in the Software Development Kit (SDK) of the SAP CC Core Server and is available with the software DVD for download
- If you have a running SAP CC Core Server System, you can consult the WSDL of a process component of the Web Services by using the following URL:
[http\(s\)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/refilling?wsdl](http(s)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/refilling?wsdl) (ex.:
<https://myhostname.corp:9080/refilling?wsdl>)
 You can access to the XSD fragments:
[http\(s\)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/refilling?xsd=1](http(s)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/refilling?xsd=1) (ex.:
<https://myhostname.corp:9080/refilling?xsd=1>)
- For your developments during the implementation phase, you need to import the necessary WSDL URLs in your development tool by using the URLs detailed above:
 Ex.: <https://myhostname.corp:9080/refilling?wsdl>

Technical Interface: Web Services**Activities**

- Depending on your business scenario, determine the refilling services you want to implement in your landscape
- Determine which type of the refill function you need to implement:
 - Direct refill to a known prepaid account
 - Indirect refill based on the knowledge of a User Technical Identifier (UTI)
- Specify the refill items (types and contents) that the external systems will send to SAP CC depending on the refill services to provide for the end customers
- Specify the information elements needed to model the refill logic
- Implement the generation and the transmission of refill items including information on local time date (see the Web Services documentation, page [37])
- Set up the refill item classes in the Core Tool to model the algorithm of the refill logic for each decision tree related to a usage refill (see page [108]).

Online/Offline Rating and Charging Functions*Data Customizing: Setting up the Public Holidays***Use**

Regarding this customization activity, you must configure and maintain the list of public holidays known by SAP CC 3.0 and that are relevant for your business.

- Data Configuration: They can be used in the configurations of master data (charge, refill logic, and pricing macro) when modeling decision trees. The public holidays are used in the logic components:
 - Public Holidays Splitter

- Public Holidays Comparison

- Runtime: SAP CC performs the rating, charging, or refill functions by using the public holidays. At the installation time, it is recommended to verify and set the public holidays to use in your business.

During the production phase, it is recommended to maintain regularly the public holidays.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool ◀. You can access to the online Help from the graphical user interface.

Default Settings

A list of public holidays is installed by *SAPinst*.

Procedure

- Launch the [Core Tool](#) and log on
- Export the current public holidays
- Edit the XML file and add or create your own public holidays
- Import the file into the Core Tool. It will update the Core Server and the database: ► Core Tool → Tools → Public Holidays → Import ◀.



NOTE

You must restart all the other Core Tool programs to take into account the changes.

Setting up the Precision and Rounding for Rating and Charging (Implementation Project)

Use

Regarding this customization activity, you determine and set up the appropriate system configuration of SAP Convergent Charging for the key rating function.

When it is required by your business scenario, you can adapt the precision and rounding mode for the calculations in SAP CC 3.0. Several system parameters are available and can be fine-tuned.

The right values depend on the business (what kind of amounts and currencies will be used) and the potential constraints of the external third party billing system.



NOTE

Consult the configurations for managing currencies in SAP Convergent Charging.

Default Settings

The precision of the rating calculations by SAP Convergent Charging is 6 digits.

Activities

The technology consultant must perform the following:

- During the implementation phase of your project:
 - Determine the appropriate system configuration
- After the initial installation of you development, quality control, or production system:
 - Launch the SAP CC [Admin+ Tool](#)

- Log on as administrator
- Set up the TRANSACTION_PRECISION and TRANSACTION_ROUNDING_MODE parameters
- Set up the TRANSACTION_DETAIL_PRECISION and TRANSACTION_DETAIL_ROUNDING_MODE parameters
- Set up the COUNTER_PRECISION and COUNTER_ROUNDING_MODE parameters
- Set up the TAX_PRECISION and TAX_ROUNDING_MODE parameters with the same values than for TRANSACTION_PRECISION and TRANSACTION_ROUNDING_MODE

More Information

Consult the *Technical Reference Guide* about the rating process.

Offline Rating and Charging Functions

This section includes configurations only relevant for a variant of the business process “Processing Charging” related to postpaid business. The BART Server and BART Tool components of SAP CC 3.0 must be installed and configured on your landscape.

Implementation of the Batch Rating By Group Function

Data Customization: Setting up the Batch Rating Groups

Use

If you have installed BART components, you may need to manage batch rating groups depending on your business needs so that the power users or the external systems (from a CRM) can create their subscriptions.

You must define your groups according to your business. Each group has a numeric identifier, a codename and a description. The code name is used to select the group in the Core Tool when creating subscriptions.

It is recommended to define the greatest possible number of batch rating groups (the maximum number of groups is 99).

Prerequisites

- It is not possible to remove or modify groups that contain subscriptions. You can always change the descriptions of all the groups.
- You cannot remove the group identified by 0. This is the default group. You can change its code name and its description to suit your needs.

Procedure

- Launch the SAP CC [Admin+ Tool](#)
- Connect to the Core Server using the `host` command
- Log on as administrator using the `user` command
- Use the `grouplist`, `groupadd`, `groupmod` and `groupdel` commands

Rerating Function with BART

This section includes implementation activities with configurations only relevant for a postpaid business. The BART Server component of SAP CC 3.0 must be installed and configured on your landscape to support the rerating function.

System Customization: Implementing the Rerating Function

Use

In this *Customizing Activity*, you can implement the rerating function: The SAP CC Core Server system generates data files that must be taken into account by the third-party billing system to change the invoices.

This implementation is only possible for the following transaction persistency processing modes:

- Charged Item Files
- Data Files

You must develop an application that loads these files into your billing system.



NOTES

- You cannot implement the rerating function if SAP CC 3.0 is configured to generate transaction files.
- In a scenario integrated with SAP Convergent Invoicing (SAP ERP / FI-CA) of the SAP Business Suite, this implementation is provided by default and the rerating function is available.

Prerequisites

- Your *Business Scenario* includes only postpaid accounts in a batch mode environment
- The SAP CC BART Server system must be installed and configured (see also the chapter about the BART Server)
- The SAP CC Core Server system is configured to generate charged files or transaction data files

Default Settings

- This function is disabled in the standard system.
- In a scenario integrated with SAP Convergent Invoicing (SAP ERP / FI-CA) of the SAP Business Suite, the rerating function is available and this customization activity is not relevant.

Activities

The following activity sequence is detailed in this section:

- Determine the retention period required for your business to provide rerating services
- Using the *Technical Reference Guide* you can determine how to transmit and parse the generated files in a third-party billing system.
- Enable the rerating function
- Change the retention period
- Change the keeping days for BART Server (see on page [\[201\]](#))

More Information

Consult the *Technical Reference Guide* on SAP Service Marketplace at the following location: <https://service.sap.com/instguidesc30> → Plan or <https://service.sap.com/instguides> → SAP Business Suite Applications → SAP Convergent Charging → SAP CC 3.0 → Plan.

Determining the Retention Period for Rerating

Use

By default the retention period is set to 40 days (1 month and 10 days). For business, legal, or technical reason you may need to change this function. You can extend this period up to 70 days.



CAUTION

Check that the retention period for rerating is equal to the total keeping days configured for BART Server.

Activities

You determine the retention period for rerating according to the business requirements.

Changing the Retention Period for Rerating

Use

You can extend the retention period up to 70 days.



CAUTION

Do not change the retention period for a production system. It must be performed at installation time.

You must change the configuration of SAP CC BART Server.

Prerequisites

- There is no subscription and no provider contract in the system
- You have determined the rerating retention period required for your business

Procedure

- Launch the [Admin+ Tool](#)
- Change the COUNTER_SNAPSHOT_COUNT system parameter according to the required retention period
- Restart the system

System Advanced Configuration: Enabling the Rerating Function

Use

By default, the rerating function is disabled in SAP CC 3.0 and not available in the Core Tool.

Prerequisites

The rerating function has been implemented in your landscape by your project team and consultants. The data files generated by the rerating process are transmitted to the external billing system.

Default Settings

- This function is disabled in the standard installation of the system.
- In a scenario integrated with SAP Convergent Invoicing (SAP ERP / FI-CA) of the SAP Business Suite, this function is enabled by default. See the dedicated chapter in this document.

Procedure

- Launch the SAP CC [Admin+ Tool](#)
- Connect to the Core Server using the `host` command
- Log on as administrator using the `user` command
- Change the value of the RERATING_ENABLED parameter to `true` so that the menu is available from the Core Tool
- Change the value of the RERATE_PROC_CLASS parameter to `com.highdeal.rif.dbFile.RerateFileProcessor` or `com.highdeal.rif.chargeditem.RerateProcessorShell` according to the transaction persistency processing modes (Data Files, Charged Item, or Refill Record Files)
- Launch the [Setup Tool](#)
- Log on as administrator
- Import a RIF configuration file using the `rif` command



NOTE

A default `rif.rater.config.xml.sk` file is provided as template. It is located in the configuration folder `<drive>:\usr\sap\<SYSTEM_ID>\CCD<INSTANCE_ID>\exe\CC_CORE_SERVER\config\<type>`, where `<type>` is 'ci' when integrated with SAP Convergent Invoicing (SAP ERP / FI-CA), or 'files' otherwise.

Refilling Function

SAP Convergent Charging features refilling functions used to provide refilling services to your end customers by implementing the SAP CC Web Services.

Refilling Directly a Prepaid Account (Implementation Project)

Use

SAP CC 3.0 manages refill requests. You need to implement the Web Services provided by SAP CC to manage these requests.

Prerequisites

- You have decided to base the charging services on the provider contracts
- Your system knows or can know the identifiers of the prepaid accounts stored in SAP Convergent Charging
- Consult the *Technical Reference Guide* about the refilling function to determine how to implement this process

Activity

To provide your end-customers with manual or automated refills, you need to implement the *Refill Management* services.

See the technical documentation to implement this function in your landscape.

Refilling a Prepaid Account from a Technical Data (Implementation Project)

Use

SAP CC 3.0 manages refill requests even if the external system does not or cannot know the appropriate prepaid account. You need to implement specifically the Web Services provided by SAP CC to manage these requests. The refill request is based on technical data that can be used by SAP CC to retrieve the appropriate prepaid account.

Prerequisites

- You have decided to base the charging services on the provider contracts
- Your system does not or cannot know the identifiers of the prepaid accounts stored in the SAP CC System
- You have configured the refill plans in SAP Convergent Charging by declaring the appropriate technical data
- The provider contracts created by your CRM application or external provisioning system include a contract item referencing such a refill plan and containing relevant user technical identifiers

Consult the *Technical Reference Guide* about the refilling function to determine how to implement this process.

Activity

To provide your end customers with manual or automated refills, you need to implement the *Refill Management* services with a specific two-step process:

- Identify from a user technical identifier the appropriate prepaid account (see the [prepaidAccountFindFromUserTechnicalIdentifierRequest](#) operation of the SAP CC 3.0 Web Services)
- Send the refill request order to the SAP CC system
- See the technical documentation to implement this function in your landscape.



NOTES

- The service identifier declared to customize the refill logic in a refill plan (see Technical Data) must be the same as the identifier present in the [prepaidAccountFindFromUserTechnicalIdentifierRequest](#) operation used when implementing the Web Services. You can provide several refill services with different IDs (manual refill from ATM, from portal).
- The user technical identifier (UTI) used when initializing the process must be present in the contract item that references this refill plan.

Charged Items and Transaction Persistency Functions

System Configuration: Setting up the Charged Item and Refill Record File Processor (CIF)

Use

By default, SAP CC 3.0 generates charged item or refill record files. You can configure this file management (path, multithreading, and rollover policy) at the postinstallation time and during the production phase. The configuration is available at the Charged item Integration Framework (CIF) level.

Procedure

- Consult the template file
(/usr/sap/<SYSTEM_ID>/CCD<INSTANCE_ID>/exe/CC_CORE_SERVER/config/<type>/cif.rater.config.xml.sk, where <type> is 'ci' when integrated with SAP CI, and 'files' otherwise) about these settings
- Export your current configuration from SAP CC:
`setup cif export -login=<LGN> -password=<PWD> rater <myfilename>`
- Change the parameters
- Import the new configuration of the CIF:
`setup cif import -login=<LGN> -password=<PWD> rater <myfilename>`
- Restart the server

Tax Function

SAP Convergent Charging features tax subfunctions for the rating and charging functions. The following activities are recommended:

System Configuration	Data Customization	Master Data Configuration
Setting up the Tax Framework <i>Default: VAT</i>	Setting up the Tax Rates <i>Default: Done</i>	Setting up the taxes for the service provider (charge plans and offers) <i>Default: No master data</i>
		Setting up the taxes for the customers (subscriber accounts) <i>Default: No master data</i>



NOTE

For more details about the tax function and process, consult the *Technical Reference Guide* on SAP Service Marketplace at the following location: ► <https://service.sap.com/instguidesc30> → Plan
◀ or ► <https://service.sap.com/instguides> → SAP Business Suite Applications → SAP Convergent Charging → SAP CC 3.0 → Plan ◀.

Quick Configuration

For development or training purposes, you just need to set up the master data of the service provider to configure the tax information for the rating and charging functions.

Setting up the Tax Functions

Use

SAP Convergent Charging 3.0 can simultaneously manage taxes for the Value Added Taxes (VAT) standard and for the US Telecommunication based on BillSoft EZTax technology.

This configuration is done at the installation time but can be changed later. You can only add a new tax framework to the framework configured at the initial installation time.



CAUTION

Do never remove a tax framework if the master data of the service provider (charge plan and offer) or of the customers (subscriber account) are set up with this tax information related to this framework.

Default Settings

The default settings depend on the installation options used for *SAPinst*.

Activities

- Enable VAT management functions
- Implement and enable the EZTax management functions



EXAMPLE

Change the TAX_FRAMEWORK parameter to: **VAT ; EZTAX**

System Configuration: Enabling the VAT Management Function

Use

If you did not select the option Value Added Taxes (VAT) management at the installation time, you may enable this function later on.



NOTE

You can also customize the data (VAT rates).

Procedure

In this procedure, you use the Setup Tool and the Configuration Tool provided with the Core Server:

- If you want to customize the VAT rates, prepare a data file:
 - Copy the file `/usr/sap/<SID>/CCD<INSTANCE>/exe/CC_CORE_SERVER/tax/vat_rate.txt` as a new file
 - Edit the new file and apply the necessary changes
 - Save it
 - Use the Setup Tool and execute the command: `setup vatax importVATRate /usr/sap/<SID>/CCD<INSTANCE>/exe/CC_CORE_SERVER/tax/<mynewfile>`
- If you do not want to customize the VAT rates, use the default `vat_rate.txt` file. Use the Setup Tool and execute the command: `setup vatax importVATRate /usr/sap/<SID>/CCD<INSTANCE>/exe/CC_CORE_SERVER/tax/vat_rate.txt`
- Execute the command: `setup vatax importCountryTaxPolicies /usr/sap/<SID>/CCD<INSTANCE>/exe/CC_CORE_SERVER/tax/country_tax_policies.txt`
- Use the Configuration Tool or the SAP CC [Admin+ Tool](#) to modify the TAX_FRAMEWORK parameter and change its value to "VAT" or "VAT;EZTAX"
- Restart all the updater and rater instances of the Core Server

Result

The SAP CC Core Server can manage tax information for the rating and charging functions. You can configure the master data of the service provider.

Data Customization: Setting up the VAT Rates

Use

In this customization activity, you must maintain the list of rates for the Value Added Taxes.

Prerequisites

- The SAP CC Core Server system is configured for the Value Added Taxes (VAT)
- The VAT rates are available in the SAP CC Core Server system

Default Settings

A list of rates for VAT rates is installed by *SAPinst* if the VAT tax framework was selected.

Procedure

- Use the Setup Tool to export and re-import the changed VAT rates
 - Execute the command: `setup vatax exportVATRate /usr/sap/<SID>/CCD<INSTANCE>/exe/CC_CORE_SERVER/tax/<myfile>`
 - Edit the new file and apply the necessary changes
 - Save it
 - Execute the command: `setup vatax importVATRate /usr/sap/<SID>/CCD<INSTANCE>/exe/CC_CORE_SERVER/tax/<myfile>`
- Restart all the updater and rater instances of the Core Server

Result

The VAT rates are up to date.

System Configuration: Implementing and Enabling the EZTax Management Function

Use

If you did not select the option EZTax management at the installation time, you may enable this function later on.



NOTE

You may need to purchase the EZTax software from BillSoft company.

Prerequisites

The EZTax third-party software must be installed on your landscape with dedicated hosts and licenses

Procedure

In this procedure, you use the Setup Tool and the Configuration Tool provided with the Core Server:

- Using the Configuration Tool, modify the parameter `TAX_FRAMEWORK` and change its value to "EZTAX" or "VAT;EZTAX".
- If the EZTax Management function has never been activated before, follow the procedure described in the section "Prerequisites for US Taxes Computation" of the Installation Guide (download EZTax, install additional library, and create a EZTax root folder)
- Execute the command: `setup eztax importTSTypes <EZTAX_ROOT_FOLDER>/transervdesc.txt`

- Edit the file `/usr/sap/<SID>/SYS/profile/DEFAULT.PFL` and do the following:
 - Locate the line `tax.ezTax = false` and replace it with `tax.ezTax = true`
 - Add a line `tax.eztaxRootFolder = <EZTAX_ROOT_FOLDER>`
- Restart the Updater and the Taxer instances of the Core Server
- Launch SAPinst, choose the option SAP Convergent Charging > Install > Standard System Installation > Core Server - Add Instances, and add Taxer instances to the system.

Result

The SAP CC Core Server can manage tax information for the rating and charging functions. You can configure the master data for the service provider.

Master Data Configuration: Setting up the Taxes for the Service Provider

Use

The power user can set up the tax information for each charge customized in a charge plan or in an offer.

Consult the online Help of the Core Tool in the SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Charge Plans ◀ and at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Offers ◀. You can access to the online Help from the graphical user interfaces.

Activities

- With the Core Tool, configure manually the charges inserted in the charge plans [page [109](#)] and in the offers [page [111](#)].

Master Data Configuration: Setting up the Taxes for the Customers (Subscriber Accounts)

Use

For test or training purposes, the power user can set up the tax information for each subscriber account.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Subscriber Accounts ◀. You can access to the online Help from the graphical user interfaces.

Activities

- For test or training purposes, you can manually configure the subscriber accounts with the Core Tool.
- For a production platform, the correct implementation must be available and takes into account the tax settings for each subscriber accounts managed in SAP CC [page [112](#)].

Currency Function

SAP Convergent Charging features currency subfunctions for the rating, charging, and refilling functions. The following activities are recommended:

System Configuration	Data Customization	Master Data Configuration	
		Service Provider	Customer

None	Setting up the ISO Currencies <i>Default: Done</i>	Setting up the currency information for a charge and for the refill logic <i>Default: No master data</i>	Setting up the currency for the customers (subscriber accounts) <i>Default: No master data</i>
	Setting up the SAP Currencies <i>Default: Done</i>	Setting up the currency information for the charge/refill plans and for the offers <i>Default: No master data</i>	

Quick Configuration

For development or training purposes, you just need to set up the master data of the service provider to select the currency.

Data Customization: Setting up the ISO Currencies

Use

You must maintain the list of ISO currencies known by the system to configure the master data of the service provider.

Default Settings

A default list of ISO currencies is configured by *SAPInst*.

Procedure

- Launch the SAP CC [Core Tool](#) and log on
- Export to a file the current list of currencies
- Edit the save
- Import the changes in the Core Tool

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → Tools → Currencies → Importing Currencies ◀.

Data Customization: Setting up the SAP Currencies

Use

See the chapter related to the scenario integrated with SAP ERP/FI-CA component of the SAP Business Suite (see page [\[150\]](#)).

Master Data Configuration: Setting up the Currencies for the Service Provider

Use

The power user can set up the currency information for [Master Data for The Service Provider](#) (see page [38]). This includes:

- Charge and refill logic
- Charge plan, refill plan, and offer



NOTES

- You can also set up the reusable charges and the refill logic with the multicurrency option. The final currency is then set up in the charge plans or offers. A unique charge can be modeled and used in different charge plans with different currencies.
- In the charge plans, you can set up the currency information for each charge customized in the plan. A specific parameter *currency* is automatically added by the Core Tool. You can set up this parameter to:
 - Redefine it with a new default value
 - Link it with an internal parameter defined in the charge plan
 - Link it with a parameter defined in the charge plan and that will be set up for each provider contract (in a CRM application or external provisioning system)
- You cannot set up the currency in a refill plan. The final currency that will be used is the currency of the prepaid account to be refilled.

Consult the online Help of the Core Tool in SAP Help Portal at:

- ▶ <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → Charges → Working With Charges → Setting up the up the Tabs of a Charge ↩
- ▶ <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → Refill Logic → Working With the Refill Logic → Setting up the up the Tabs of the Refill Logic ↩
- ▶ <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → Charge Plans → Working With Charge Plan → Setting up the up the Tabs of a Charge ↩
- ▶ <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → Offers → Working With Charges in an Offer → Setting up the up the Tabs of a Charge in an Offer ↩

You can access to the online Help from the graphical user interfaces.

Activities

With the Core Tool, configure manually:

- The reusable charges (see page [107])
- The reusable refill logic (see page [108])
- The charges customized in a charge plan (see page [109]) and in the offers (see page [111])
- The refill logic customized in a refill plan (see page [109])

Master Data Configuration: Setting up the Currency for the Customers (Subscriber Accounts)

Use

For test or training purposes, the power user can set up the currency information for each subscriber account.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Subscriber Accounts ◀. You can access to the online Help from the graphical user interfaces.

Activities

- For test or training purposes, you can manually configure the subscriber accounts with the Core Tool.
- For a production platform, the correct implementation must be available and takes into account the currency settings for each subscriber accounts managed in SAP CC [page 112].

Managing a Currency Reform (Implementation Project)

Use

A currency reform is a change of some characteristics of a currency or a replacement of a currency by another one. The calculated prices must be converted by applying a certain exchange rate.

SAP CC 3.0 can manage several currencies simultaneously. This is possible only when the different currencies are used in different price plans and charged on different accounts.

There is no native support for a currency reform that would enable to switch from one currency to another without switching the pricing implementation (master data of the service provider) and the end customer data (subscriber accounts, subscriptions, and provider contracts) to new data.

- During the initial implementation phase of SAP CC 3.0, if a currency reform is already known and planned, the master data configuration of the service provider can be also designed in a way to prepare and facilitate this future currency reform (see the recommendation below).
- During the maintenance phase of SAP CC 3.0, each case of currency reform must be managed as a new independent implementation project which depends on the way SAP CC 3.0 is used and integrated with other software products.

You must check or take several points into account when starting an implementation project for a currency reform.



RECOMMENDATION

If possible, design the pricing logic independently from the currency by:

- Designing multicurrency charges, offers and charge plans
- Using reusable business objects such as translations tables and pricing macros. Two charges, in two different currencies, can then be defined using the same pricing logic defined in a single table and macro but just differing on the final computed amount and currency.

Activities

- If the currency reform has an impact on the third party invoicing system:
 - It may have consequences on the dates or time frames for the currency switch (alignment with the production of invoices, for example).
 - It may have consequences on the definition of External Accounts to be used in the SAP CC 3.0 (modification of the existing External Accounts to use the new currency or creation of new External Accounts for the new currency).
- Does the switch occur progressively or at the same time for all the subscribers? What downtime is acceptable for the switching?

- It may have consequences on the sequence of needed modifications (activate the charges with the new currency of the subscription, modify the charging mapping or the creation of prepaid accounts or external accounts, and so on). Depending on the constraints, you must consider if the batch or the migration on the fly fit better to your needs.

Output Result Data

Charged Item Management

Use

By default, SAP CC 3.0 generates charged items resulting from the rating and charging process functions. Some configuration activities are necessary when installing the system.

Activities

- System configuration
 - Set up the transaction persistency processing mode [page [112](#)]
 - Set up the charged item file processor
- Master data configuration
 - Create the charged item classes (master data) [page [Error! Bookmark not defined.](#)]
 - Create the charges in charge plans or offers for configuring the contents of fields of charged items that will be generated by SAP CC [page [107](#)]
- Customization
 - Implement the load of the charged item files produced by SAP CC 3.0 to your external third party billing system



NOTE

The charged items include data related to dates belonging to the local time zones. The billing system converts the data relating to the right time zone when it is required by your business.

Refill Record Management

Use

By default, SAP CC 3.0 generates refill records resulting from the refilling process. Some configuration activities are necessary when installing the system.

Activities

- Set up the transaction persistency processing mode (see page [112](#))
- Set up the refill record file processor
- Create the refill record classes (master data) [page [Error! Bookmark not defined.](#)]
- Create the charges in offers for configuring the contents of fields of refill records that will be generated by SAP CC (see page [107](#))
- Implement the load of the refill record files produced by SAP CC 3.0 to your external third party billing system

**NOTE**

The refill records include data about the local time zones. The billing system converts the data relating to the right time zone when it is required by your business.

Charged Transaction Management

Use

The versions of SAP Convergent Charging previous to version 2.0 generate charged transactions in files. For backwards compatibility purposes, SAP CC 3.0 can generate charged transactions if necessary. However, we recommend that you upgrade your platform.

To generate charged transactions, some configuration activities are necessary when installing the system.

**CAUTION**

Only for versions previous to SAP CC 2.0.

You cannot create and configure new offers to generate charged transactions. You can only set up new offers to generate charged items. Therefore, we recommend that you upgrade your landscape by migrating your old offers to SAP CC 3.0 and that you use the charged item file output. To test this upgrade, you can configure SAP CC to generate both types of data.

Activities

- Set up the transaction persistency processing mode [page [112](#)]
- Set up the transaction file processor or the data file processor

Advanced System Configurations

Advanced System Configuration: Setting up the Transaction Persistency Processing Mode (TIF)

Use

By default, SAP CC 3.0 generates charged items and refill record files resulting from the rating, charging, and refilling functions.

For upgrade purposes, SAP CC 3.0 can also be configured to generate transaction files or data files. The system configuration is available at Transaction Integration Framework (TIF) level. Your master data (charges and charges in offers) must be compliant with these old modes.

The TRANSAC_PROC_CLASS parameter can have the following values:

Output Processing Mode	Parameter Value	Rating Function Can be Implemented
------------------------	-----------------	------------------------------------

Charged Items or Refill Record Files	<code>com.highdeal.tif.chargeditem.TransactionProcessorShell</code>	Yes
Transaction Files	<code>com.highdeal.tif.tfp.TransactionFileProcessor</code>	No
Data Files	<code>com.highdeal.tif.dbFile.TransactionFileProcessor</code>	Yes
Customized	Consult your solution consultant or your technology consultant.	

**NOTE**

Consult the *Technical Reference Guide* about the advantages and limitations of these modes for managing the charged transaction persistency.

Prerequisites

You are upgrading a previous version of SAP CC that was configured to generate transaction files or data files.

Procedure

- Change the value of the TRANSAC_PROC_CLASS parameter and apply the necessary settings for the selected function

Advanced System Configuration: Generating Files with Charged Transactions and Charged Items

Use

For upgrade purposes, you can configure SAP CC 3.0 so that it simultaneously generates charged item files and data in a previous file format (transaction files or data files). This advanced and temporary system configuration is available at CIF level. Once configured, SAP CC will use the configurations of the charges in offers for generating the appropriate record (charged item or charged transaction) and storing it into files.

**NOTES**

- The power users can only create offers that are compliant with the generation of charged items and refill records. We recommend that you upgrade your system regarding the charged item and refill record mechanism. You can configure SAP CC 2.0 so that it generates data files, charged item files, and refill records according to the configuration of the offers used in the system.
- This function is not available if you have configured charge plans for the service provider.

Prerequisites

- You are upgrading a previous version of SAP CC that was configured to generate transaction files or data files.
- There is no charge plan configured in the system. You do not plan to create charge plans in the catalogs of the service provider.

Procedure

- **Export the current configuration:**
`setup cif export -login=<LGN> -password=<PWD> rater <myfilename>`
- **Enclose the CIF configuration of the rater instances:**

```
<dispatchTransactionProcessor>
  <transactionProcessorWrapper
class="com.highdeal.tif.dbFile.TransactionFileProcessor" />
  <chargedItemTransactionProcessor>
    ...
  </chargedItemTransactionProcessor>
</dispatchTransactionProcessor>
```
- **Import the new configuration of the CIF:**
`setup cif import -login=<LGN> -password=<PWD> rater <myfilename>`
- **Restart all the rater instances of the Core Server**

**NOTE**

You can also configure SAP CC so that it generates transaction files by using `com.highdeal.tif.tfp.TransactionFileProcessor` as the class name in the above procedure.

Advanced System Configuration: Setting up the Transaction File Processor

Use

For compatibility purposes, you can configure SAP CC 3.0 so that it generates transaction files as described in the *Technical Reference Guide* on SAP Service Marketplace.

The configuration is available at the `Transaction Integration Framework (TIF)` level.

**NOTES**

- The power users cannot easily maintain the offers created with SAP CC 1.0. We recommend that you upgrade your system to use the charged item mechanism. You can configure SAP CC 2.0 so that it generates transaction files and charged item files according to the configuration of the offers used in the system.
- This function is not available if you have configured charge plans for the service provider.

Prerequisites

- There is no charge plan configured in the system.
- You do not plan to create charge plans in the catalogs of the service provider.

Activities

- Set up the parameters for the Core Server according to your previous version of SAP CC: `TFP_TRANSAC_DETAILS`, `TFP_TRANSAC_FILTERS` and `TFP_TRANSAC_xxx`

Advanced system Configuration: Setting up the Data File Processor

Use

For backward compatibility purposes, you can configure SAP CC 3.0 so that it generates data files including prepaid and postpaid transactions as described in the *Technical Reference Guide* on SAP Service Marketplace.

The configuration is available at Transaction Integration Framework (TIF) level.



NOTES

- The power users cannot easily maintain the offers created with SAP CC 1.0. We recommend that you upgrade your system to use the charged item and refill record mechanism. You can configure SAP CC 3.0 so that it generates transaction files and charged item files according to the configuration of the offers used in the system.
- This function is not available if you have configured charge plans for the service provider.

Prerequisites

- There is no charge plan configured in the system.
- You do not plan to create charge plans in the catalogs of the service provider.

Activities

- Set up the parameters for the Core Server according to your previous version of SAP CC: POSTPAID_DB_FILE_PROCESSOR_TRANSAC_FORMAT, POSTPAID_DB_FILE_PROCESSOR_TRANSAC_DETAIL_FORMAT and similar parameters.

6 Master Data for The Service Provider

This chapter lists the master data configurations of the SAP CC 3.0 Core Server. SAP Convergent Charging provides a graphical user interface ([Core Tool](#)) that is used for creating all the necessary pricing elements of a service provider.

Business Objects

Master Data

In SAP Convergent Charging 3.0, you must configure two key categories of master data:

- Master data dedicated to the charging information related to the marketable services of the service provider
- Master data dedicated to the customers of these services

Master Data for the Service Provider	Master Data for the Customers
Main Business Objects: <ul style="list-style-type: none"> ■ Refill Logic and Reusable Charge ■ Pricing Macro ■ Charge Plan / Refill Plan ■ Offer (*) 	Main Business Objects: <ul style="list-style-type: none"> ■ Subscriber Account ■ Provider Contract ■ Subscription (*)
Other Business Objects: <ul style="list-style-type: none"> ■ Pricing Macro ■ Mapping Table ■ Translation Table (*) ■ Tier Table (*) ■ Billable Item Mapping 	Other Business Object(s): <ul style="list-style-type: none"> ■ Subscriber Mapping Table ■ Access



NOTE (*)

Some objects are only available with the old data model of SAP Convergent Charging. They are only visible if you have upgraded your landscape to this version of SAP CC and if you have kept the old master data.

Two Data Models

SAP Convergent Charging 3.0 provides two data models for master data:

- A new model based on provider contracts is available for facilitating the integration with a Customer Relationship Management (CRM) system. The commercial product is configured in

the CRM system by using charging units available from SAP CC: Charge plans. This model includes also some new objects (refill logic and refill tree) to configure the refilling function.

- The previous model based on subscriptions

The key functions of SAP CC can process all these objects.

You must configure the following master data objects:

New Model (Contract based)	Old Model (Subscription based)
Service Provider Level: <ul style="list-style-type: none"> ■ Reusable Charge (**) ■ Refill Logic ■ Charge Plan ■ Refill Plan 	Service Provider Level: <ul style="list-style-type: none"> ■ Reusable Charge ■ Offer
Customer Level: <ul style="list-style-type: none"> ■ Subscriber Account (**) ● Prepaid Account ● External (Postpaid) Account ■ Provider Contract ● Contract Item ■ Access 	Customer Level: <ul style="list-style-type: none"> ■ Subscriber Account ● Prepaid Account ● Credit Limit ● External (Postpaid) Account ■ Subscription ■ Access

Consult the *Technical Reference Guide* on SAP Service Marketplace at the following location: <https://service.sap.com/instguidesc30> → Plan or <https://service.sap.com/instguides> → SAP Business Suite Applications → SAP Convergent Charging → SAP CC 3.0 → Plan.



(**) NOTES

- The subscriber account does not include credit limit balances.
- The reusable charge must include a dictionary of internal charging references. These references must have a type (postpaid or prepaid).

Data Settings for the Service Provider

Setting up Chargeable Item Classes

Use

SAP CC 3.0 receives chargeable items for charging the usage of a customer service. The network elements or the service applications send the chargeable items to deliver these marketable services.

SAP CC 3.0 can transmit different classes of chargeable items. Each chargeable item class is defined by a set of properties. The charging process uses these properties when executing the price plan of the charges that apply to a chargeable item class.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool* → *Chargeable Item Class* → *About Chargeable Item Classes* ◀. You can access to the online Help from the graphical user interfaces.

Activities

The technology consultant must:

- Determine the relevant chargeable item classes
- Determine the necessary properties for each class. A class must not include all the properties transmitted within a chargeable item.
- Implement the transmission of those data (see page [112] about Usage Acquisition)
- Configure the chargeable item classes in SAP CC so that the power users can design charges including price plans that will use these properties for the rating calculation: ► *Core Tool* → *File* → *New* → *Chargeable Item Package* ◀.



NOTE

Some of these properties can be used by the billing and invoicing processes in a third party billing system.

Prerequisites

- Your implementation has specified the data which are sent to SAP CC for being rated and charged
- A catalog must exist in SAP CC for the service provider

Procedure

- Start the Core Tool and log on
- Create a chargeable item package to which you add chargeable item classes for a service provider
- Save the chargeable item package(s) in the database



NOTE

You can group the classes in one or several packages according to the business of the service provider.

Setting up Refill Item Classes

Use

SAP CC 3.0 receives refill items of different classes to refill a prepaid account. Each refill item class is defined by a set of properties. These properties are used by the refilling process when executing the refill logic.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool* → *Refill Item Class* → *About Refill Item Classes* ◀. You can access to the online Help from the graphical user interfaces

Activities

The consultant must:

- Determine the relevant refill item classes depending on how SAP CC is integrated with an external system (ERP or billing)
- Determine the necessary properties for each class. A class must not include all the properties transmitted within a refill item
- Implement the transmission of these data
- Configure the refill item classes in SAP CC so that the power users can design the refill logic including the algorithms that will use these properties for the refilling calculation: ► *Core Tool* → *File* → *New* → *Refill Item Package* ◀.



NOTE

Some of these properties can be used by the billing and invoicing processes in a third party billing system.

Prerequisites

- Your implementation has specified the data which are sent to SAP CC for being refilled
- A catalog must exist in SAP CC for the service provider

Procedure

- Start the Core Tool and log on
- Create a refill item class for a service provider
- Save the refill item class(s) in the database

Setting up Charged Item Classes

Use

By default, SAP CC 3.0 outputs charged items resulting from the rating and charging processes. Some classes can be configured and reused during the configuration of charge plans or offers.

For each class, you can configure its structure (list of fields) and the generation method of each field.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool* → *About Charged Item Class* ◀. You can access to the online Help from the graphical user interfaces

Activities

The solution consultant and the power user must:

- Determine the classes of charged items that SAP CC must output for the invoicing process
- Determine the contents of these classes and the method for generating each field of a class: SAP CC computes these fields when executing price plans in charges
- List the fields that need to be generated by a price plan because they are not calculated by default by SAP CC or because they are not present in the incoming chargeable item

Procedure

- Start the Core Tool and log on

- Create the new charged item classes and save them in the database: ► *Core Tool* → *File* → *New* → *Charged Item Class*.

Recommendations for the Configuration of Charged Item Classes

This table lists the data that can be generated by SAP CC and stored in the charged items. Use this table when configuring:

- A charged item class
- The charges in a charge plan or in an offer (see the charged item mapping)

Field	Description
Account Type Code	The type code of an account in a subscriber account: 0: prepaid account 1: external postpaid account
Account Type Name	The type of an account in a subscriber account: prepaid or external
Amount (Excl.)	The total amount of the charged transaction <i>This field is an alias of chargedTotalAmount</i>
Base Amount	
Base Rated Amount	The amount which has been computed by the master charge (or the charge component). This amount is used as a reference amount by the dependent charges related to the master charge.
Charge Activation Cancellation Date	The cancellation date of the subscription Available only for cancellation of a one-shot rate in a charge
Charge Activation Code	The identifier (code) of the activated charge in a provider contract or of a subscription Note: This identifier can also be the identifier of the refill logic in a provider contract
Charge Activation Effective Date	The creation date of the subscription Available only for one-shot rates with an activation event
Charge Component Name	Type name of the activated rate component: Usage Rates Recurring Rates One-Shot Rates
Charge Date	Date of the charged event
Charge Reference	When the charging process was based on an external reference, it is the identifier (code) of this reference.

Field	Description
Charge Reference Name	When the charging process was based on an external reference, it is the identifier (name) of this reference that has been defined in the charging plan of the activated charge.
Charge Type Code	Type code of: 0=closing, 1=refillCharge, 2=internalCharge, 3=externalCharge, 4=notCharged
Charge Type Name	Type of: closing, refillCharge, internalCharge, externalCharge, notCharged
Chargeable Item Class Name	The identifier (name) related to the chargeable item class of the chargeable item which was charged Available only for usage charging
Chargeable Item Package Code	The identifier (code) related to the chargeable item package of the chargeable item which was charged Available only for usage charging
Charged Amount is a Credit	“true” if the charging process generates a credit; otherwise, “false” This field is related to the type of operation in the charge condition
Charged Amount is a Debit	“true” if the charging process generates a debit; otherwise, “false” This field is related to the type of the operation in the charge condition
Charged Item or Refill Record Set identifier	The identifier of a set of charged items or of a set of refill records generated by the system Note: A charged item set consists of a charged item coming from a master charge and possibly from charged items coming from dependent charges
Charged Item Set Identifier	The identifier of a set of charged items as a number This set consists of a charged item coming from a master charge and possibly from charged items coming from dependent charges
Charged Tax Amount	The tax amount of the charged transaction <i>This field is an alias of taxAmount</i>
Charged Tax Code	The tax code of the charged transaction <i>This field is an alias of taxCode</i>
Charged Tax Detail	
Charged Tax Status Code	The code of the tax status for the charged transaction: tsNoTax: Tx status when no tax is applied tsForInfo: Tx status to indicate that the tax is given for

Field	Description
	<p>information</p> <p>tsApplied: Tx status when the tax is applied</p> <p>tsTaxExempted: Tx status for the tax exemption</p> <p>tsBuyerSubjectToPay: Tx status for indicating that the buyer is in charge to reverse the tax to the tax authority</p> <p>tsTaxMissedForInfo: Tx status for indicating that the information is missing for the data related to the tax</p> <p>tsTaxMissedForApply: Tx status for indicating that the tax information is missing to apply the tax</p> <p>tsUnknown: Tx status when the tax status is unknown</p> <p>This field is an alias of taxStatusCode</p>
Charged Tax Status Identifier	<p>The code of the tax status for the charged transaction:</p> <p>0: Tx status when no tax is applied</p> <p>1: Tx status for indicating that the tax is given for information</p> <p>2: Tx status when the tax is applied</p> <p>3: Tx status for the tax exemption</p> <p>4: Tx status for indicating that the buyer is in charge to reverse the tax to the tax authority</p> <p>-1: Tx status for indicating that the information is missing for the data related to the tax</p> <p>-2: Tx status for indicating that the tax information is missing to apply the tax (not used – deprecated)</p> <p>-3: Tx status when the tax status is unknown</p>
Charged Total Amount (Incl.)	<p>Total amount of the charged transaction</p> <p>This field equals totalAmount and amount</p>
Charged Transaction is a Prepaid Debit	
Charged Transaction is a Prepaid Refill	
Charging Component Name	
Charging Detail Field	taxDetail
Contract Identifier	
Contract Item External Identifier	
Contract Item Identifier	
Contract Type	
Currency	The ISO 4217 three-letter currency code of the charged transaction
End of Rating Recurring Period	<p>The end date of the period related to a recurring rate</p> <p>This period may be different from the "End of Rating Reference Recurring Period" used when the recurring charge is prorated.</p>

Field	Description
End of Rating Reference Recurring Period	The end date of the reference period related to a recurring rate
Event Date	The date of the rated event This field equals the consumption date related to a usage rate or the triggering date related to recurring rates or one-shot rates.
Excluded Last Day of the Rating Recurring Period	
External Account Code	Code of the postpaid account to be charged when a postpaid service is processed. The code is defined in the external account of a subscriber account.
External System Code	Code of the external system to be charged when a postpaid service is processed. The code is defined in the external account of a subscriber account.
First Dispatch Code	The dispatch code # 1 which is the name of the property chosen as the first criteria when filtering External Account transactions
Name of Rate Component Used	Transaction label = rate component name
Offer Code	The identifier (code) of the activated offer
Overrun From	Available in the context related to the prepaid account overrun. It is the identifier of the prepaid account which has called the overrun. It is empty for the first overrun.
Overrun To	Available in the context related to the prepaid account overrun. It is the identifier of the prepaid account from which the overrun is called. It is empty for the last overrun.
Prepaid Balance Amount	The amount of the prepaid account after the charging process
Prepaid or External Account Code	The identifier (code) of the account in a subscriber account (prepaid or external postpaid)
Prerating Reservation Identifier	The identifier of the reservation for the prerating process The prerating function is deprecated.
Price Plan Name	The identifier (name) of the activated price plan of a charge in a provider contract or in a subscription
Produced by a Master Charge Component	1 if isMaster(); otherwise, 0
Rated Amount	Amount of the rated transaction (without currency) This field equals chargedAmount when there is no overrun
Rated Amount is Prorated	True if "prorated"
Rated Amount is Refunded	True if "refunded"

Field	Description
Rated Boolean	
Rated Date	
Rated Number	
Rated String	
Rated Tax Amount	The amount of the computed tax
Rated Tax Code	The code of the tax
Rated Tax Status Code	See chargedTaxStatusCode
Rated Tax Status Identifier	See chargedTaxStatusId
Rated Total Amount	The amount of the charging (tax included)
Rating Activation Date	The date when the recurring charge is triggered during a recurring charging process
Rating Consumption Date	The consumption date of the chargeable item related to a usage charging process
Rating Event Origin	Origin of the transaction: U, R, or O depending on the following values: Transaction.USAGE, Transaction.RECURRING, Transaction.ONESHOT
Refill Amount	
Refill Currency	
Refill Date	
Refill ISO Currency	
Second Dispatch Code	The dispatch code # 2 which is the name of the property chosen as the second criteria when filtering External Account transactions
Service Identifier	The service identifier of the chargeable item related to the usage of a service and provided by an end customer Available only for usage charging
Service Provider Name	The identifier of the service provider of the subscriber account The identifier can be the name of the catalog of the service provider.
Session Rating Reservation Identifier	The identifier of the session Available only for session-based charging
Start of Rating Recurring Period	The period start related to a recurring rate The period may be different from the "Start of Rating Reference Recurring Period" used when a recurring charge is prorated
Start of Rating Reference Recurring Period	The reference period start date related to a recurring rate

Field	Description
Subscriber Account Code	The subscriber account identifier (code)
Subscriber Account Reference	The subscriber account reference
Subscriber Consumes Service (Client)	"true" if equals Transaction.CLIENT_RELATIONSHIP; otherwise, false
Subscriber Provides Service (Partner)	"true" if equals Transaction.PARTNER_RELATIONSHIP; otherwise, "false"
Subscription Code	The identifier (code) related to the subscription that has been triggered
Subscription Commitment Expiration Date	The commitment date of the subscription
Subscription Resumption Date	The resumption date of the subscription
Subscription Suspension Date	The suspension date of the subscription
Tax Amount	Charged Transaction tax amount <i>This field is an alias of chargedTaxAmount</i>
Tax Code	Charged Transaction tax code, =chargedTaxCode
Tax Determination Type	If the tax status is TaxStatus.APPLIED, TaxStatus.BUYER_SUBJECT_TO_PAY, TaxStatus.TAX_EXEMPTED, TaxStatus.NO_TAX, the system returns "00" If the tax status is TaxStatus.FOR_INFO and the tax module is VAT, the system returns "01" If the tax status is TaxStatus.FOR_INFO and the tax module is US, the system returns "04" Otherwise, the system returns "00"
Tax is Included in Total Amount	The system returns "true" if taxStatus == TaxStatus.APPLIED or taxStatus == TaxStatus.FOR_INFO; otherwise, the system returns "false"
Tax Status Code	Charged Transaction tax status code, =chargedTaxStatusCode
Tax Status Identifier	See chargedTaxStatusId
Third Dispatch Code	The dispatch code # 3 which is the name of the property chosen as the third criteria when filtering External Account transactions
Total Amount (Incl.)	This field is an alias of chargedTotalAmount
Unrounded Rated Amount	Amount computed by the charge component having up to 6 decimal places before being rounded according to the TRANSACTION_PRECISION parameter. This field is required for the tax framework but may not be used in the charged item mapping.
US Transaction Business Class	
US Transaction Call Duration	

Field	Description
US Transaction County Exempt	
US Transaction County Exempt	
US Transaction Customer Type	
US Transaction Facilities-Based Flag	
US Transaction Federal Exempt	
US Transaction Franchise Flag	
US Transaction Incorporated Code	
US Transaction Lifeline Flag	
US Transaction Line Count	
US Transaction Location Count	
US Transaction Origin	
US Transaction Origin Flag	
US Transaction Regulated Flag	
US Transaction Resale Flag	
US Transaction Service Address	
US Transaction Service Address Flag	
US Transaction Service Class	
US Transaction Service Type	
US Transaction State Exempt	
US Transaction Tax Data	
US Transaction Taxation Date	
US Transaction Telecom Type	
US Transaction Termination	
US Transaction Termination Flag	
US Transaction Type	
User Service Identifier	The identifier of the end customer related to the usage of a service that was charged
VAT Transaction Gross Price Flag	true
VAT Transaction Rate Code	The code of the VAT tax rate defined at charge condition level (in an offer)

Field	Description
VAT Transaction Raw Rate	The specific tax rate customized in the charge of a charge plan or of an offer
VAT Transaction Raw Rate ID	The identifier (name) of the specific tax rate as it is defined in the charge customized of a charge plan or of an offer

Setting up Refill Record Classes

Use

By default, SAP CC 3.0 outputs refill records resulting from the refilling process. Some classes can be configured and reused in different refill plans.

For each class, you can configure its structure (list of fields) and the generation method of each field.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Refill Record Class ◀. You can access to the online Help from the graphical user interfaces.

Activities

The solution consultant and the power user must:

- Determine the classes of the refill records that SAP CC must output for the invoicing process
- Determine the contents of these classes and the method for generating each field of a class
SAP CC computes these fields when executing price plans in charges
- List the fields that need to be generated by a price plan because they are not calculated by default by SAP CC or because they are not present in the incoming refill item

Procedure

- Start the Core Tool and log on.
- Create the new refill record classes and save them in the database: ► Core Tool → File → New → Refill Record Class.

Setting up a Charge

Use

SAP CC 3.0 use charges for managing fees related to the use of a customer service. The charges apply to certain chargeable item classes. You can design commercial offers by reusing charges. A charge includes a price plan and a charging plan that must be configured for being executed by the rating process and the charging process.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → Charges → About Charges ◀. You can access to the online Help from the graphical user interfaces

Prerequisites

You have configured all the necessary chargeable item classes to design price plans.

Activities

The solution consultant and the power user must:

- Determine the relevant fees and list the charges to be created.
- Configure the charges in SAP CC so that the power users can design commercial offers. Each charge includes a price plan and a default charging plan.
- Maintain these charges.

Procedure

- Start the Core Tool and log on.
- Create the new charges and save them in the database: ► *Core Tool* → *File* → *New* → *Charge*.

Setting up the Refill Logic

Use

The refill logic is used by SAP CC 3.0 for managing refills related to the use of a customer service. The usage refills apply to certain refill item classes. You can design commercial offers that feature refill services by reusing refill logic objects from the catalog of the service provider.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool* → *Refill Logic* → *About Refill Logic* ◀. You can access to the online Help from the graphical user interfaces.

Prerequisites

You have configured all the necessary refill item classes to design the calculation algorithm for usage refills.

Activities

The solution consultant and the power user must:

- Determine the relevant fees and list the charges to be created.
- Configure the charges in SAP CC so that the power users can design commercial offers. Each charge includes a price plan and a default charging plan.
- Maintain these charges.

Procedure

- Start the Core Tool and log on
- Create the new refill logic objects and save them in the database: ► *Core Tool* → *File* → *New* → *Refill Logic*

Setting up the Counter Name Dictionary

Use

A counter name dictionary is a list of counter names and descriptions that are used by all the SAP users when modeling charge plans or refill plans that show counters to an external CRM or provisioning system.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool* → *Tools* → *Counter Dictionary* ◀. You can access to the online Help from the graphical user interfaces.

Prerequisites

You have a charging scenario variant based on charge plans and provider contracts.

When modeling your catalog, you have identified that a counter declared in a charge plan or in a refill plan must be visible and initialized in an external CRM or a provisioning system.

Activities

The power user must:

- Create and maintain a list of counter names that can be used in a charge plan and in a refill plan

Procedure

- Start the Core Tool and log on
- Create the new counters and save them in the database: ► *Core Tool* → *Tool* → *Counter Dictionary...* → *Add*

Setting up a Charge Plan

Use

Charge Plans are used by SAP CC 3.0 for managing the conditions of pricing agreements related to the usage of a customer service when SAP Convergent Charging is integrated with an external CRM or a provisioning system.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool* → *About Charge Plans* ⚡. You can access to the online Help from the graphical user interfaces

Prerequisites

You have configured all the necessary charged item classes.

You have configured all the necessary charges with charging plans that use internal charging references assigned to an account type (prepaid or postpaid).

Activities

The power user must:

- Determine the relevant charge plans to be created
- Determine the complete list of charges to be inserted in these charge plans
- Configure the charge plans in SAP CC so that the power users can design charges including price plans that will use these properties for the rating function.

Procedure

- Launch the Core Tool and log on
- Create the new offers and sub-offers and save them in the database: ► *Core Tool* → *File* → *New* → *Charge plan*

Setting up a Refill Plan

Use

Refill plans are used by SAP CC 3.0 for managing the conditions of pricing agreements related to the usage of a customer service when SAP Convergent Charging is integrated with an external CRM or a provisioning system.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Refill Plans ◀. You can access to the online Help from the graphical user interfaces.

Prerequisites

You have configured all the necessary refill record classes.

You have configured all the necessary charges with refill plans that use internal charging references assigned to an account type (prepaid or postpaid).

Activities

The power user must:

- Determine the relevant refill plans to be created
- Determine the complete list of charges to be inserted in these refill plans
- Configure the refill plans in SAP CC so that the power users can design charges including price plans that will use these properties for the rating function.

Procedure

- Launch the Core Tool and log on.
- Create the new offers and sub-offers and save them in the database: ► Core Tool → File → New → Refill plan.

Recommendations for the Initialization of Counters Shared In Provider Contracts

Use

If you want to share a counter between several items in a provider contract, you may need to set up some specific configurations in the catalog of the service provider. By default such a shared counter is initialized with the zero value. If you want to design other initial values, you must create the logic that will initialize the counter with the value of a parameter redefined in each provider contract.

They are four possible configurations:

Possible Configurations	Data	Cycle
Create and set up a new charge plan with a customized charge that includes a recurring rate component charged at the start of the period	Dedicated charge plan	Periodic
Create and set up a new charge plan with a customized charge that includes a one-shot rate component based on the <i>Activation</i> event (creation of the related contract item)	Dedicated charge plan	One-Off
Configure the refill logic of an existing refill plan with a customized charge that includes a recurring refill	Existing refill plan	Periodic
Configure the refill logic of an existing refill plan with a customized charge that includes a one-shot refill component based on the <i>Activation</i> event (creation of the contract item referring to this refill plan)	Existing refill plan	One-Off



IMPORTANT NOTE

Do not mix these configurations inside a provider contract or check that they will not introduce a wrong behavior of SAP CC regarding to the initialization of the counter shared in the provider contract. Check also the periodical resets of this counter.

Consult the online Help of the SAP CC Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool* → *Provider Contracts* → [Sharing counters among provider contract items](#) ◀. You can access to the online Help from the graphical user interfaces.

Prerequisites

- The counter sharing function is implemented in the CRM application



EXAMPLE

SAP CRM creates provider contracts that include counters shared between the items of each contract. Refillable units are implemented by using shared counters. See the [Configuration with the Integrated Scenario Consume-To-Cash](#) on page [122].

Setting up an Offer

Use

An offer represents the master data of a service provider used in SAP Convergent Charging for managing the conditions of pricing agreements related to the use of a marketable service by a customer.



NOTES

- This object is replaced by the charge plan master data since SAP CC 3.0.
- If your SAP CC system is interconnected with a CRM system, use charge plans and refill plans (see page [109]).

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool* → *About Offers* ◀. You can access to the online Help from the graphical user interfaces

Prerequisites

Your SAP CC system must be configured to manage offers. This function may not be present in your landscape.

You have configured all the necessary charges, charged items or refill record classes.

Activities

The power user must:

- Determine the relevant offers and suboffers to be created
- Determine the complete list of charges to be inserted in these offers
- Configure the offers in SAP CC so that the power users can design charges including price plans that will use these properties for the rating calculation.

Procedure

- Launch the Core Tool and log on
- Create the new offers and sub-offers and save them in the database: ► *Core Tool* → *File* → *New* → *Offer*

Implementation Tasks

Assigning a Charge/Refill Plan to a Commercial Product

Use

SAP CC 3.0 manages charge plans and refill plans that must be combined and bundled in a CRM application. You need to implement the Web Services provided by SAP CC to manage properly these data.



NOTES

- You can download the documentation on SAP Service Marketplace at: ► <https://service.sap.com/instguidesc> → *SAP Convergent Charging* → *SAP CC 3.0* → *Plan* ◀.
- The documentation for the Web Services of SAP CC is also included in the Software Development Kit (SDK) of the SAP CC Core Server and is available with the software DVD for download
- If the SAP CC Core Server System is running, you can consult the WSDL of this process component of the Web Services by using the following URL:
`http(s)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/catalog?wsdl` (ex.:
`https://myhostname.corp:9080/catalog?wsdl`)
You can access to the XSD fragments:
`http(s)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/catalog?xsd=1` (ex.:
`https://myhostname.corp:9080/refilling?xsd=1`)
- For your developments during the implementation phase, you need to import the relevant WSDL into your development tool by using the URL detailed above.
Ex.: **`https://myhostname.corp:9080/catalog?wsdl`**

Prerequisites

You have decided to base the convergent charging services on the provider contracts.

Consult the *Technical Reference Guide* about the provisioning function to determine how to implement this process.

Activity

You need to use the *Cross Catalog Management* process component of the Web Services.

Use the technical documentation to implement this function in your landscape.

7 Master Data for the Customers

In a production or a quality assurance landscape, the master data related to end customers are created and maintained by a CRM or external provisioning system. You need to integrate SAP Convergent Charging 3.0 with this system. SAP CC provides different technical interfaces for this integration.

Replication, distribution or synchronization processes may exist between these systems and SAP CC. Consult the *Technical Reference Guide* for more details about the provisioning processes.

To test the pricing elements (master data for of the service provider), you can manually create the master data for few customers in a development landscape.



NOTE

SAP provides you with an integrated scenario with SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite. Some synchronization and replication mechanisms are available between these components and are managed by SAP CRM.

Manual Configurations

In a development and test system, you can manage the master data related to an end customer. This is useful to test the pricing modeling. With the SAP CC [Core Tool](#) you can create:

- A subscriber account including prepaid accounts and external postpaid accounts
- A subscriber mapping table
- A provider contract
- A subscription based on an offer in the catalog of the service provider



CAUTION

Do never perform these configurations in a quality assurance or production system of SAP Convergent Charging.

Setting up a Subscriber Account for Testing

Use

SAP CC 3.0 uses subscriber accounts to store balance management and account information. You can manually and temporarily create a subscriber account for test or training purposes.

For a quality assurance or production system, the provisioning functions must be implemented between your CRM application and SAP CC to manage these data. See this implementation activity detailed in the next sections.



NOTE

For a detailed procedure, consult the online Help of the Core Tool in SAP Help Portal at: ►

<http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Subscriber Accounts ↩.

Prerequisites

You work with a development and test system

Procedure

To manually create a subscriber account for development, test, or training purposes:

- Launch the Core Tool and log on
- Create and setup the new subscriber account and save it in the database: ► Core Tool → File → New → Subscriber Account

Setting up a Subscriber Mapping Table

Use

In SAP CC 3.0, you can manually and temporarily create a subscriber mapping table to use in a provider contract item via a dedicated parameter.

For a quality assurance or production system, the provisioning functions must be implemented between your CRM application and SAP CC to manage these data. See this implementation activity detailed in the next sections.

Prerequisites

- You work with a development and test system
- You have a catalog for the service provider with the necessary mapping table class

Procedure

To manually create a subscriber mapping table for development, test, training, or demo purposes:

- Launch the SAP CC [Core Tool](#) and log on
- Create and setup the new subscriber mapping table and save it in the database: ► Core Tool → File → New → Subscriber Mapping Table



NOTE

For a detailed procedure, consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Subscriber Mapping Table ↩.

Setting up a Provider Contract

Use

In SAP CC 3.0, you can manually and temporarily create a provider contract to simulate the creation processed by a CRM application or an external provisioning system. You can set up manually a provider contract and add the relevant contract items and other elements (counters, parameters).

Provisioning functions must be implemented between your CRM or provisioning system and SAP CC in order to manage these data.



NOTE

Necessary accesses are automatically created and maintained by SAP CC in background.

Recommendation

You can use this function for training purpose if your landscape does not include a CRM application or an external provisioning system already interfaced with the SAP CC Core Server.

Prerequisites

- You work with a development and test system
- Master data for the service provider includes the charge plan(s) and the refill(s) plan you want to activate in the items of the contract
- Master data related to the end customers are available: subscriber account, subscriber mapping table
- You have solid knowledge of provider contract in SAP CC
- You have solid knowledge of provisioning process of provider contracts in SAP CC by using the *Web Services* interface

Procedure

- Launch the SAP CC [Core Tool](#) and log on
- Model and define the expected content for a provider contract. You must simulate the work performed by a CRM application. You must identify:
 - The counters
 - The relevant contract items
 - The parameters
 - The account assignments
- Create manually the new provider contract and save it in the database: ► *Core Tool* → *File* → *New* → *Provider Contract*



NOTE

For a detailed procedure, consult online help of the Core Tool from SAP Help Portal at: ► <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool* → *Provider Contracts* → *About Provider Contracts* ◀.

Setting up a Subscription and Accesses for Testing

Use

SAP CC 3.0 uses subscriptions for storing balance management and account information. You can manually and temporarily create a subscriber account for test or training purposes. Provisioning functions must be implemented between your CRM or provisioning system and SAP CC to manage these data.



NOTE

For a detailed procedure, consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → *SAP CC 3.0* → *Core Tool* → *Subscriptions* → *About Subscriptions* ◀.

Prerequisites

- You work with a development and test system
- The master data for the service provider includes an offer you can subscribe to

Procedure

- Launch the Core Tool and log on
- Manually create the new subscription and save it in the database: ► *Core Tool* → *File* → *New* → *Subscription*
- Add the necessary accesses for this subscription: ► *Core Tool* → *File* → *New* → *Access*

Implementation Tasks

This section provides an overview of the development activities necessary to implement the customer data provisioning processes in your landscape:

- Initial mass provisioning
- Migration of data




RECOMMENDATION

If you require high level performance for the charging services, you can use the `start_cache_command` of Admin+ Tool to force the update the complete SAP CC system after the creation of master data related to the end customers.

SAP CC provides several technical interfaces:

- Web Services (for provider contracts)
- HTTP Communication Interface (HCI) (for subscriptions)

Customer Master Data	Web Services	HCI
Subscriber Accounts	Yes <ul style="list-style-type: none"> ■ Prepaid accounts ■ External (postpaid) accounts 	Yes <ul style="list-style-type: none"> ■ Prepaid accounts ■ External (postpaid) accounts ■ Credit limit balances
Subscriber Mapping Tables	Yes	N/A
Provider Contracts	Yes <ul style="list-style-type: none"> ■ Charging contracts <div>  NOTE Automated creation of accesses </div>	N/A
Subscriptions	N/A	Yes
Accesses	Managed by the SAP CC system in background	Yes

Setting up the Subscriber Accounts (Implementation Project)

Use

SAP CC 3.0 uses subscriber accounts for storing balance information and account information for each customer of a service provider. Provisioning functions must be implemented between your CRM application and SAP CC to manage these data.



NOTE

For development, test, or training purposes, you can manually and temporarily create a subscriber account via the Core Tool. Consult the sections above.

Prerequisites

- You have decided to base the charging services on the provider contracts or the subscriptions.
- Consult the *Technical Reference Guide* about the provisioning function to determine how to implement this process.

Activity

Determine the technical interface you will use to create the subscriber accounts.

SAP CC 3.0 Technical Interface	Charging based on provider contracts	Charging based on subscriptions
Web Services (WS) – SOAP	X	
Http Communication Interface (HCI) – Java APIs or XML		X

Determine how you can implement subscriber accounts, prepaid accounts and external postpaid accounts.

Determine if you need to implement the management of subscriber mapping tables.

Use the technical documentation to implement this provisioning function in your landscape (see page [37]).



NOTES

- You can download the documentation on SAP Service Marketplace at: <https://service.sap.com/instguidescs> → SAP Convergent Charging → SAP CC 3.0 → Plan ↩.
- The documentation for the Web Services of SAP CC is also included in the Software Development Kit (SDK) of the SAP CC Core Server and is available with the software DVD for download
- If the SAP CC Core Server system is running, you can consult the WSDL related to this process component of the Web Services by using the following URL:
[http\(s\)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/suacProvisioning?wsdl](http(s)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/suacProvisioning?wsdl) (ex.: <https://myhostname.corp:9080/suacProvisioning?wsdl>)
 You can access to the XSD fragments:
[http\(s\)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/suacProvisioning?xsd=1](http(s)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/suacProvisioning?xsd=1) (ex.: <https://myhostname.corp:9080/suacProvisioning?xsd=1>)

- For your developments during the implementation phase, you need to import the relevant WSDL into your development tool by using the URL detailed above.

Ex.: <https://myhostname.corp:9080/suacProvisioning?wsdl>

Setting up the Subscriber Mapping Tables (Implementation Project)

Use

In this *Customization activity*, you determine how you implement the subscriber mapping tables and you develop the integration between SAP CC and your CRM application (or another external provisioning system).

SAP CC 3.0 uses subscriber mapping tables assigned to a subscriber account for storing information necessary to perform the charging or the refilling process when using the settings of a provider contract.

A provider contract item can link several subscriber mapping tables.

The same subscriber mapping table can be link by several contract items in different provider contracts. You can use a subscriber mapping table for a group of provider contracts.



EXAMPLE

By default, SAP CRM shares a subscriber mapping table with several provider contracts.

Prerequisites

- You have decided to base the charging services on the provider contracts
- Consult the *Technical Reference Guide* about the provisioning processes to determine how to implement these functions

Activities

- Determine if you want to create a unique subscriber mapping table that can be shared by several provider contracts. Determine if you want to create few tables and shared a table to a group of provider contracts.
 - If yes, design the implementation of the subscriber account provisioning process to create and maintain subscriber mapping tables in SAP CC.
- Determine if you want to create a subscriber mapping table for each provider contract assigned to a subscriber account.
 - If yes, design the implementation of the provider contract provisioning process to create and maintain subscriber mapping tables in SAP CC.



NOTE

Both use cases can be simultaneously implemented.

- Develop the integration by using the *Web Services* technical interface provided by SAP CC. You must use the process component: *Management of Subscriber Mapping Tables*.

**NOTES**

- For more information, consult the *SOAP API Specifications* for the *Web Services* in SAP Help Portal at the location: ► <http://help.sap.com/cc> → SAP CC 3.0 → *Development Information* → *SOAP* ◀.
- You can download the documentation on SAP Service Marketplace at: ► <https://service.sap.com/instguidescc> → *SAP Convergent Charging* → *SAP CC 3.0* → *Plan* ◀.
- The documentation for the *Web Services* of SAP Convergent Charging is also included in the Software Development Kit (SDK) of the SAP CC Core Server and is available with the software DVD for download.
- If the SAP CC Core Server system is running, you can consult the WSDL related to this process component of the *Web Services* by using the following URL:
`http(s)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/subscriberMappingTableManagement?wsdl`
 You can access to the XSD fragments:
`http(s)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/subscriberMappingTableManagement?xsd=1`
- For your developments during the implementation phase, you need to import the relevant WSDL into your development tool by using the URL detailed above.

**EXAMPLE**

If the SAP CC Core Server system is running and the updater instance is installed on the host machine `updaterhostname`, you can access to the:

- WSDL at:
`https://updaterhostname.corp:9080/subscriberMappingTableManagement?wsdl`
- XSD fragments at:
`https://updaterhostname.corp:9080/subscriberMappingTableManagement?xsd=1`

Use the technical documentation to implement this function in your landscape (see page [37]).

Setting up the Provider Contracts and Accesses (Implementation Project)

Use

SAP CC 3.0 uses provider contracts for storing balance management and account information. Provisioning functions must be implemented between your CRM application and SAP CC to manage these data.

**NOTE**

For development, test, or training purposes, you cannot manually create a provider contract via the Core Tool.

**EXAMPLE**

In a scenario integrated with the SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite,

these master data objects are managed and synchronized with all the components (SAP CRM, SAP ERP).

For more information, see the *Configuration Guide for SAP CRM 7.0 Enhancement Package 2 (for the Telecommunications business scenario Sales and Order Management)*.

Prerequisites

- You have decided to base the charging services on the provider contracts or the subscriptions
- Consult the *Technical Reference Guide* about the provisioning processes to determine how to implement these functions

Activity

Use the technical documentation to implement this function in your landscape (see page [37]).



NOTES

- You can download the documentation on SAP Service Marketplace at: <https://service.sap.com/instguidesc> → SAP Convergent Charging → SAP CC 3.0 → Plan.
- The documentation for the Web Services of SAP CC is also included in the Software Development Kit (SDK) of the SAP CC Core Server and is available with the software DVD for download
- If the SAP CC Core Server System is running, you can consult the WSDL related to this process component of the Web Services by using the following URL:
`http(s)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/contractProvisioning?wsdl`
(ex.: `https://myhostname.corp:9080/contractProvisioning?wsdl`)
You can access to the XSD fragments:
`http(s)://<UPDATER_INSTANCE_HOST>:<PORT_NB>/contractProvisioning?xsd=1`
(ex.: `https://myhostname.corp:9080/contractProvisioning?xsd=1`)
- For your developments during the implementation phase, you need to import the relevant WSDL into your development tool by using the URL detailed above.
Ex.: `https://myhostname.corp:9080/contractProvisioning?wsdl`

Setting up the Subscriptions and Accesses (Implementation Project)

Use

SAP CC 3.0 uses subscriptions for storing balance management and account information. Provisioning functions must be implemented between your CRM or provisioning system and SAP CC to manage these data.



NOTE

For development, test, or training purposes, you can manually and temporarily create a subscription and its accesses via the Core Tool. Consult the sections above.

Prerequisites

You have decided to base the charging services on the provider contracts or the subscriptions.

Consult the *Technical Reference Guide* about the provisioning function to determine how to implement this process.

Activity

Use the technical documentation to implement this function in your landscape (see page [\[37\]](#)).

8 Configuration with the Integrated Scenario Consume-To-Cash

Overview

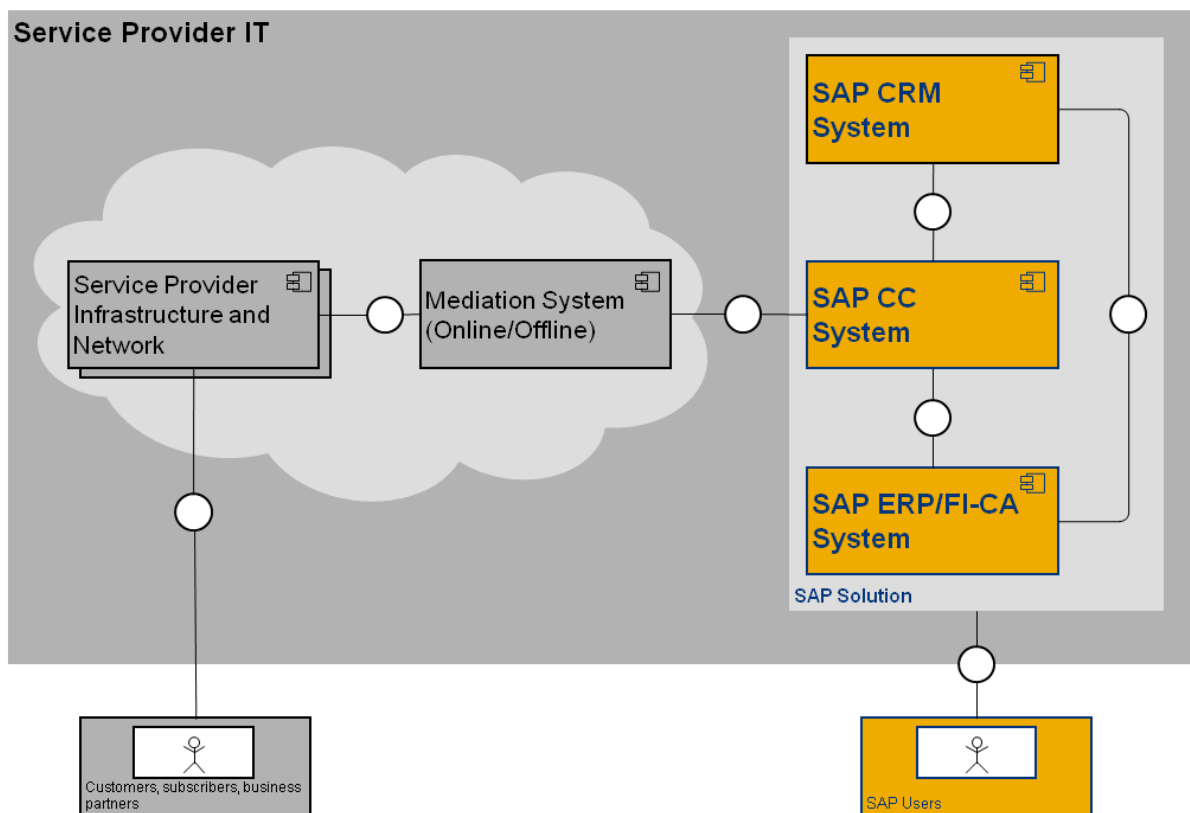
SAP Convergent Charging 3.0 can be integrated with the *Consume-To-Cash in High-Volume Business* value scenario. This cross-industry scenario aggregates both the *Convergent Charging* and the *Convergent Invoicing* business scenarios.

This value scenario integrates the scenarios *Consume-To-Cash in High-Volume Business* and *Sales and Order Management in Call Center*.

This new integrated scenario interfaces the SAP CC 3.0 software component with the SAP CRM and the SAP ERP/FI-CA components of the SAP Business Suite:

- SAP Convergent Charging
- Contract Accounts Receivable and Payable (FI-CA) including SAP Convergent Invoicing as part of SAP ERP
- Sales and Order Management and Financials Customer Care based on Contract Accounts Receivable and Payable (FI-CA) as part of SAP CRM

The SAP CC 3.0 system models the charging data, the calculations (rating, charging, and refilling functions), the acquisition of usage items, and the generation of billable items in bulk in the SAP ERP/FI-CA system.



Overall Prerequisites

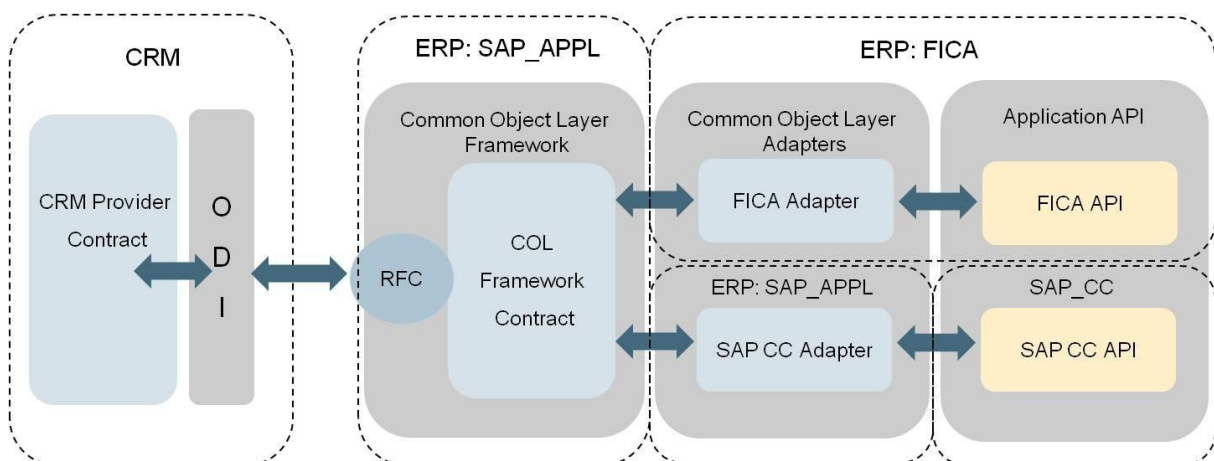
You can use this section as a checklist. All these elements are managed by the configuration documentation provided for these SAP software components:

- The three systems (SAP CRM, SAP CC, and SAP ERP) of the SAP Business Suite are up and running
- You have the necessary configuration documents listed in this chapter
- The relevant business functions (BFs) are active in the SAP CRM and SAP ERP Systems
- The relevant *Web Services* provided by the SAP CC Core Server system are activated in the SAP CRM and SAP ERP systems with the appropriate settings (proxy, logical port, and WSDL access) by using the transaction SOAMANAGER from both systems.



RECOMMENDATION

First consult the *Integration Guide for the Order-to-Cash End-to-End Process* and the configuration documentation for SAP CRM and SAP ERP which is the complete reference. The integration guide is the central starting point for this integrated scenario. You can find the latest version of the guide on SAP Service Marketplace at: <https://service.sap.com/notes> → SAP Notes Search → Number → [1647059](https://service.sap.com/notes) ↩.



Main Interfaces Dedicated to the Configuration of Master Data

SAP CRM Configurations and Customizing

Customizing

- The relevant Business Functions (BF) are active for this integrated scenario:
 - CRM_TEL_1: Financial Customer Care for Telecommunications
 - CRM_TEL_SOM_1: Sales & Order Management for Telecommunications
 - CRM_PROVORDERINT_1: Integration of SAP CC and SAP CI with the Provider Order
 - CRM_FCA_1: FCC and Dispute Management for Contract AR/AP
- The COL Framework is configured for this integrated scenario
- The relevant *Web Services* provided by SAP CC are activated in SAP CRM:
 - CO_CRM_ISX_CC_CATALOG_SERVICES

- CO_CRM_ISX_CC_RATING_SERVICES



NOTES

Consult the latest versions of these documents:

- For more information about the necessary configurations of the COL Framework for SAP CRM, see the *Customizing* chapter in the configuration guide *Common Object Layer for SAP Business Suite*.
- For more information about the activation of the Web Services in SAP CRM, see the relevant chapter in the *Integration Guide for the Order-to-Cash End-to-End Process*.
- For more information about the relevant configurations for SAP CRM, consult the *Configuration Guide for SAP CRM 7.0 EhP2* available for the *SAP for Telecommunications* business scenario *Sales and Order Management*.

This documentation is available in SAP Solution Manager: ► *Solutions/Applications* → *SAP For Telecommunications* → *Scenarios* → *Sales and Order Management in Call Center* → *Configuration* ◀.

SAP ERP/FI-CA Configurations and Customizing

Customizing

- The relevant Business Functions (BF) are active for this integrated scenario:
 - CONVERGENT_INVOICING: Telco: Invoicing to Contract Accounts Receivable and Payable
 - RM-CA: Telco: Revenue Management - Contract Accounting
 - TEL_BI_INV_1: Telco, Enhanced Billing&Invoicing
 - TEL_CA_1: Telco, Enhanced Revenue Mgmt
 - TEL_CA_2: Telco, Enhanced Revenue Mgmt
 - TEL_CA_3: Telco, Contract Accounts A/R and A/P 3
 - TEL_CA_4: Telco, Contract Accounts A/R and A/P 4
 - TEL_CONV_INV_1: Telco, Enhanced Invoicing
 - TEL_EDR_BILLING: Telecommunications, Billing
 - TEL_INV_1: Telco, Convergent Invoicing
 - TEL_INV_PP_1: Telco, Invoicing in Contract Accounts Receivable and Payable
 - TEL_INV_PP_2: Telco, Billing in Contract Accounts Receivable and Payable 2
 - Z_TEL_INV_PP_1: Billable Item Mgmt (Downport from EHP05 activated for Postal)
- The relevant *Web Services* provided by SAP CC are activated in SAP ERP:
 - CO_FKKCC_RATING_SERVICES
 - CO_FKKCC_REFILLING
 - CO_FKKCC_SUBSCRIBER_ACCOUNT
 - CO_ISX_CC_CTR_PROV_SERVICES (for the provider contract provisioning services)

Configurations

To send billable items to the SAP ERP/FI-CA System, the following configurations are expected FI-CA:

- An appropriate billable item class is configured in Billing (in Contract Accounts Receivable and Payable) and the interface component *SAP Convergent Charging* has been activated for the class
- This billable item class is activated
- Transfer rules exist for the billable item class

- Interfaces and objects for the class are generated
- The basic settings for the reversal of billable items are configured
- A user dedicated to *SAP Convergent Charging* exists with a type set to *Communication Data* and authorizations for the authorization objects F_KKBIXBIT, F_KKBIXCON, and S_TABU_DIS

**NOTES**

Consult the latest versions of these documents:

- For more information about the relevant configurations for SAP ERP/FI-CA, consult the configuration documentation for the *Convergent Billing* business process of the *Convergent Invoicing* business scenario:
 - [Integration of Convergent Charging business scenario with Convergent Invoicing business scenario](#)
 - Required Business Functions
- For more information about the activation of the Web Services in SAP ERP, see the relevant chapter in the *Integration Guide for the Order-to-Cash End-to-End Process*.
- For more information about the integration of SAP Convergent Charging 3.0 and SAP ERP/FI-CA, see the SAP Library for the SAP ERP Enhancement Packages:
 - Consult the SAP Help Portal at the following location: ► <http://help.sap.com> → SAP ERP → SAP ERP Central Component → SAP ERP Enhancement Packages → ERP Central Component Enhancement Package 6 → Industries in SAP ERP → SAP Telecommunications → Contract Accts. Rec./Payable for Telecommunications (SAP RM-CA) → SAP Convergent Invoicing → Billing in Contract Accounts Receivable and Payable → Integration of Billing in Other Applications → [Integration with SAP Convergent Charging](#) ◀.
 - You can also consult the Configuration of Billable Item Classes

Typical Configurations

Sequence ID	Configuration Type	Description	Condition		
			Development landscape	Test landscape	Production landscape
1 (*)	Technical Customizing: System Settings	Technical Features of the Core Server	Recommended	Mandatory	Mandatory
2 (*)	Business Customizing		Not relevant <i>The default settings are enough</i>	Mandatory	Mandatory
3 (*)	Technical Customizing: Implementation	Usage Data Acquisition (online or offline)	Not mandatory for managing master data	Mandatory	Mandatory

		rating and charging)			
4 (*)	Master Data Configuration	Charging Data for the Service Provider	Mandatory	Mandatory	Mandatory

(*) The sequence order can be changed and scheduled according to a project planning.

Technical Customizing

System Settings

	System Settings	Procedure	Default Settings	Development Landscape	Quality Assurance or Production Landscape
1 (*)	License Management	46	A temporary or permanent license is installed	Recommended	Mandatory
2	User Management	49	Consult the <i>Security Guide</i> for details	Recommended	Mandatory
3	Logging	52	Default configuration activated	Not relevant <i>The default settings are enough</i>	Recommendation: Check the default configuration
	Communications	53	Default configuration activated		
	Database Communication	59	Default configuration activated		
	System Landscape Directory	60	Function not activated	Not relevant <i>The default settings are enough</i>	Recommended
	JCo Communication	127	Default configuration activated		Mandatory
	Secured JCo Communications	129	A default configuration is activated if the option was selected		Recommended

			at the installation time		
	Notifications via JCo			Not relevant <i>The default settings are enough</i>	Mandatory

System Settings for JCo Communication

Before changing these system settings, consult the *Security Guide for SAP Convergent Charging 3.0* to check your IT security policy.



NOTE

- This configuration is performed by *SAPinst*. You do not need to change these system settings at the initial installation time.

System Settings for the JCo Communications

Use

SAP CC 3.0 calls RFCs of the SAP CRM and ERP / FI-CA systems by using the SAP JCo.

You must manually configure these settings when upgrading from SAP CC 2.0 to SAP CC 3.0.

During the production life cycle or your landscape, you can maintain these communication settings.

Configuration Parameter	Description
JCo server application parameters	
jco.client.ashost	Application server host or Gateway host
jco.client.sysnr	SAP System Number used for determining the Gateway service
JCo client application parameters	
jco.client.client	
jco.client.user	
jco.client.passwd	
jco.client.lang	
Tuning parameters	
jco.destination.peak_limit	The maximum number of active connections that can be created for a destination simultaneously

jco.destination.pool_capacity	The maximum number of idle connections left open by the destination
	The value of 0 means that there is no connection pooling

**NOTES**

- SAP CC 3.0 is provided with a template configuration file (jco.destination.sk) that includes the relevant system configuration parameters. This file is located in the folder: /usr/sap/<SYSTEM_ID>/CCD<INSTANCE_ID>/exe/CC_CORE_SERVER/config/ci/
- Some other parameters are available in case of secured network communications (SNC). See the next sections.
- Consult the SAP CC 3.0 Security Guide about technical users required for SAP CC and about secured communications.

Default Settings

- These system configurations are set at the installation time by *SAPInst*
- In case of an upgrade, these settings are not configured

Prerequisites

The RFC destination has been created with the procedure relevant for your system landscape when installing the SAP CRM system or the SAP ERP / FI-CA system in case of an integrated scenario with these components of the SAP Business Suite.

Activities

The following procedures are detailed in the next sections:

- Set up the jco.destination used to connect to the SAP CRM system
- Set up the jco.destination used to connect to the SAP ERP/FI-CA system
- Set up Secured Network Communications (SNC) for JCo

Setting up the jco.destination Used to Connect to the SAP ERP/FI-CA System**Use**

SAP CC 3.0 calls RFCs of the SAP ERP/FI-CA system by using the SAP JCo. These configurations are set at the installation time by *SAPInst*. You have to maintain these communication settings.

Prerequisites

- The RFC destination has been created with the procedure relevant for your system landscape when installing the SAP ERP/FI-CA system for the *Convergent Invoicing* business scenario.

Procedure

To change the JCo configuration related to SAP ERP / FI-CA:

- From SAP CC Core Server, export the current configuration in a file:
`setup sapci exportConfiguration -login=<LGN> -password=<PWD> <myfilename>`
- Edit this file and change the connection parameters according to your landscape changes
- Import the new configuration file:
`setup sapci importConfiguration -login=<LGN> -password=<PWD> <myfilename>`

- Restart the Core Server

Setting up the jco.destination Used to Connect to the SAP CRM System

Use

SAP CC 3.0 calls RFCs of the SAP CRM system by using the SAP JCo. These configurations are set at the installation time by *SAPInst*. You have to maintain these communication settings.

Prerequisites

- The RFC destination has been created with the procedure relevant for your system landscape when installing the SAP CRM system for the *Consume To Cash* value scenario.

Procedure

To change the JCo configuration related to SAP CRM:

- From SAP CC Core Server, export the SNC parameters using the following command: `setup jcodestination export crm <myfilename>`
- Edit the file <myfilename> to include the relevant properties described in the above sections
- Import the SNC parameters using the following command: `setup jcodestination import crm <myfilename>`
- Restart the Core Server

System Settings for Secured JCo Communications

Consult first the *Security Guide for SAP CC 3.0* to define the appropriate IT security policy for the landscape including SAP Convergent Charging.



NOTE

- This configuration is performed by *SAPInst*. You do not need to change these system settings at initial installation time.

Implementing Secured JCo Communications

Use

SAP CC 3.0 uses SAP JCo to communicate with the application server and JCo. It is possible to encrypt the RFC communications using the SAP Cryptographic Library technology. The Core Server system of SAP CC 3.0 can securely communicate with:

- The SAP CRM system and
- The SAP ERP / FI-CA system



NOTES

- Consult the *Security Guide of SAP CC 3.0* for the security policy information
- This function is not available for the Communications Taxing Server of SAP CC 3.0

Prerequisites

The following prerequisites apply for SAP CC 3.0:

- A security policy concept is defined by IT for the SAP CC landscape
- If the option “*Install SAP Cryptographic Library*” has not been checked at the installation time, some technical preparations are necessary

Activities

The following sequence of activities is necessary for this implementation:

Sequence ID	Description	Condition	Note
1	Installing the SAP Cryptographic Library	Mandatory (*)	A pre-configuration can be performed at the initial installation by <i>SAPInst</i> if the “Install SAP Cryptographic Library” option was checked.
2	Setting up a Personal Security Environment (PSE) for SNC	Mandatory	
3	Creating Credentials	Mandatory	
4	Exchanging Public-Key Certificates	Mandatory	
5	Setting up the JCo configurations in SAP CC Core Server	Mandatory	
6	Maintaining the System ACL on the Application Server	Mandatory	
7	Maintaining the Extended User ACL on the Application Server	Mandatory	

The different steps are detailed in this section.



NOTE (*)

In case of an upgrade from SAP CC 2.0 or in case of a late activation of this security function, the first step of the sequence must be performed manually by a system administrator.

Installing the SAP Cryptographic Library

Use

If the SAP Cryptographic Library has not been installed at the initial installation, you need to install it on the landscape.

Default Settings

- These configurations are already present by default only if the “*Install SAP Cryptographic Library*” security option has been checked at the initial installation time
- These configurations are not available by default in case of
 - An upgrade from SAP CC 2.0
 - A late change of the configuration to enable secured JCo communications

Procedure

The procedure below must be executed on the host machine where the initial installation was executed:

- Download the SAP Cryptographic Library archive on SAP Service Marketplace, and place it in a temporary folder of the host
- Log on as the user <sid>adm on the host
- Prepare the security folder for SAP CC in the profile area:
 - Create the common folder: /usr/sap/<SID>/SYS/profile/sec/
 - Create the file /usr/sap/<SID>/SYS/profile/sec/sec.lst with the following content: `sec`
- Install the library
 - Uncompress the archive by executing the following command from the temporary folder: `/usr/sap/<SID>/SYS/exe/uc/<platform>/SAPCAR -xvf <sapcrypto_archive>`
 - Locate the folder corresponding to your architecture among the extracted files.
 - Copy the files in that folder to the folder: /usr/sap/<SID>/SYS/exe/uc/<platform>/
 - Locate the supplied `ticket` file from the extracted archive
 - Copy this file to the common folder /usr/sap/<SID>/SYS/profile/sec/
 - Create a launch script `sapgenpse4cc` in the security folder for executing the `sapgenpse` program from the library:

OS	Command
Windows	Create the file <drive>:\usr\sap\<SID>\profile\sec\sapgenpse4cc.bat with the following content: <pre>@ECHO OFF set SECUDIR=<drive>:\usr\sap\<SID>\SYS\profile\sec C:\usr\sap\<SID>\SYS\exe\uc\NTAMD64\sapgenpse.exe %*</pre>
UNIX	Create the file /usr/sap/<SID>/SYS/profile/sec/sapgenpse4cc.sh with the following content: <pre>#!/bin/sh export SECUDIR=/usr/sap/<SID>/SYS/profile/sec /usr/sap/<SID>/SYS/exe/uc/<platform>/sapgenpse \$*</pre>

- You will use this launch script and not directly the `sapgenpse` program. This script creates a temporary environment variable `SECUDIR` that includes the path to the security folder for SAP CC in the profile area.
- Locate all the files containing the instance profiles of the dispatcher and bulkloader instances (instances types CCD and CCB) located in the common folder: /usr/sap/<SID>/SYS/profile/. For each file:
 - Make a backup copy of the file, then edit it
 - Locate the entry "Start_Program_<XX>" in the section "Start JStartup"
 - Change the value of XX to XX+2 (e.g. "Start_Program_05" to "Start_Program_07")
 - Add the following content at the end of the file, changing the values of XX and XX+1 based on the value previously found in the file (e.g. "Start_Program_05" and "Start_Program_06")

```
# -----
# SAP Cryptographic Library configuration
# -----
SETENV_01 = SECUDIR=$(DIR_INSTANCE)/sec
```

```
Start_Program_<XX> = immediate $(DIR_CT_RUN)$(DIR_SEP)sapcpe$(FT_EXE) pf=$( _PF)
list:$(DIR_PROFILE)$(DIR_SEP)sec$(DIR_SEP)sec.lst source:$(DIR_PROFILE)
target:$(DIR_INSTANCE)
Start_Program_<XX+1> = immediate $(DIR_CT_RUN)$(DIR_SEP)sapcpe$(FT_EXE) pf=$( _PF)
list:$(DIR_CT_RUN)$(DIR_SEP)sapcrypto.lst source:$(DIR_CT_RUN)
target:$(DIR_EXECUTABLE)
ssf/name = SAPSECULIB
ssl/ssl_lib = $(DIR_EXECUTABLE)$(DIR_SEP)$(FT_DLL_PREFIX)sapcrypto$(FT_DLL)
sec/libsapsecu = $(ssl/ssl_lib)
ssf/ssfapi_lib = $(ssl/ssl_lib)
```

- Save the edited file
- Apply these changes to the instance profiles of all the dispatcher and bulkloader instances of the SAP CC Core Server system
- Restart the services for the dispatchers and bulk loaders instances using the command:
`sapcontrol -nr <instance_number> -host <host> -function RestartService`
- Restart the dispatchers and bulk loaders instances using the command: `sapcontrol -nr <instance_number> -host <host> -function Start`
- Go to next step: Setting up a Personal Security Environment (PSE) for SNC

Setting up a Personal Security Environment (PSE) for SNC

Use

When using the SAP Cryptographic Library as the security product for SNC, SAP CC 3.0 must possess a Personal Security Environment (PSE). This PSE contains information related to the SAP CC public-key, which includes its private key, its public-key certificate, and the list of public-key certificates that it trusts.

To create the SNC PSE for SAP Convergent Charging, use the `sapgenpse4cc` launch script for executing the `sapgenpse` command-line tool from the SAP Cryptographic Library as detailed below.

Prerequisites

- The SAP Cryptographic Library is installed on SAP CC 3.0 landscape (see previous procedure)

Procedure

To create a PSE in the security folder of SAP Convergent Charging, use the following command line:
`sapgenpse4cc get_pse -p <PSE_Name> -x <PIN> <Distinguished_Name>`

Where `<Distinguished_Name>` is made up with the following elements:

- CN = <Common_Name>
- OU = <Organizational_Unit>
- O = <Organization>
- C = <Country>



EXAMPLE

The following command line creates a `SAP_CC.pse` file that is protected with a PIN code ("ccpin"):

```
sapgenpse4cc get_pse -p SAP_CC.pse -x ccpin "CN=SAPCC, O=MyCompany, C=US"
```

When using this PSE, SAP Convergent Charging has the following **Distinguished Name**: CN=SAPCC, O=MyCompany, C=US.

Creating Credentials

Use

SAP CC 3.0 must have active credentials at run-time to be able to access its Personal Security Environment (PSE).

The credentials are located in the cred_v2 file in the security folder of SAP Convergent Charging.



CAUTION

Make sure that only the user under which SAP CC Core Server runs has access to the cred_v2 file (including read access) in the security folder: /usr/sap/<SID>/SYS/profile/sec/.

Prerequisites

- The SAP Cryptographic Library is installed for SAP Convergent Charging
- A personal security environment (PSE) is set up in the security folder of SAP CC

Procedure

- Use the following command line to create credentials:

OS	Command
Windows	<code>sapgenpse4cc seclogin -p <PSE_Name> -x <PIN> -O [<NT_Domain>\]<user_ID></code>
UNIX	<code>sapgenpse4cc seclogin -p <PSE_Name> -x <PIN> -O <user_ID></code>

- Protect the access of the cred_v2 file



EXAMPLE

The following command line creates credentials for the user SAPService<SID> so that it can access the SAP_CC.pse file. Note that the PIN code that protects the PSE is “ccpin” in this example:

OS	Command
Windows	<code>sapgenpse4cc seclogin -p SAP_CC.pse -x ccpin -O SAPService<SID></code>
UNIX	<code>sapgenpse4cc seclogin -p SAP_CC.pse -x ccpin -O <SID>adm</code>

Result

The credentials file (cred_v2) of the user specified with the `-O` option is created in the security folder of SAP CC.

Exchanging Public-Key Certificates

Use

To be able to communicate using SNC, the SAP system application server must be able to identify SAP CC Core Server and vice versa. This identification process takes place using the information stored in the server's PSE. You must exchange the servers' public-key certificates so that they can identify each other. This must be done for each SAP system application server that SAP CC is connected to (for example SAP ERP/FI-CA and SAP CRM).

For more information, see the SAP Library:

- Exporting the Server's Certificate Using SAPGENPSE
- Maintaining the Server's Certificate List Using SAPGENPSE

- Using the Trust Manager

Prerequisites

- The SAP Cryptographic Library is installed on SAP CC 3.0 landscape (see previous procedure)
- A personal security environment (PSE) is set up in the security folder of SAP CC
- Credentials are credited
- The SAP NetWeaver system possesses a PSE to use for Secured Network Communication (SNC)

Procedure

- Export the SAP CC public-key certificate
 - You can use the `export_own_cert` option of the `sapgenpse4cc` tool:
`sapgenpse4cc export_own_cert -o <output_file> -p <PSE_Name> -x <PIN>`
- Import the SAP CC public-key certificate into the SAP NetWeaver application server's SNC PSE:
 - If the application server is an SAP Web Application Server with Release 6.20 or later, then you can use the trust manager ("STRUST" transaction) to import the certificate.
 - Otherwise, use the `maintain_pk` command of the `sapgenpse`:
`sapgenpse4cc maintain_pk -a <cert_file> -p <PSE_Name> -x <PIN>`
- Export the application server's public-key certificate
 - If the application server is an SAP Web Application Server with Release 6.20 or later, then you can use the trust manager
 - Otherwise, use the `export_own_cert` command of the `sapgenpse` tool installed on the Application Server
- Import the application server's public-key certificate into the SNC PSE of SAP CC
 - Use the `maintain_pk` command of the `sapgenpse4cc` tool



EXAMPLE

- On SAP CC Core Server system, enter the following command line to export its public-key certificate:
`sapgenpse4cc export_own_cert -o SAP_CC.crt -p SAP_CC.pse -x ccpin`
- On the application server system, enter the following command line to import this certificate into the application server's SNC PSE:
`sapgenpse maintain_pk -a SAP_CC.crt -p SAPSNC.pse -x sappin`
- On the application server, enter the following command line to export its public-key certificate:
`sapgenpse export_own_cert -o SAPSNC.crt -p SAPSNC.pse -x sappin`

On SAP CC Core Server system, enter the following command line to import this certificate into the SNC PSE of SAP CC:

```
sapgenpse4cc maintain_pk -a SAPSNC.crt -p SAP_CC.pse -x ccpin
```

Result

The two servers can identify each other using SNC.

Setting up the JCo Configurations in SAP CC Core Server

Use

You can use the information from the table below to configure and use Secured Network Communications (SNC) for these connections:

- SNC mode
- SNC library path
- Level of protection
- Identifiers of the interconnected applications

Configuration Parameter	Description	Comment
jco.client.snc_mode	<p>Flag for activating Secured Network Communications (SNC)</p> <p>Possible values:</p> <ul style="list-style-type: none"> ■ 0 (not activated) ■ 1 (activated) 	Required
jco.client.snc_lib	<p>Path and file name of the external library</p> <p>Possible values depending on the OS:</p> <p>.././././sapcrypto.dll (Windows)</p> <p>../libsapcrypto.so (Linux)</p> <p>../libsapcrypto.so (HP-UX)</p> <p>../libsapcrypto.so (Solaris)</p> <p>../libsapcrypto.o (AIX)</p>	Required
jco.client.snc_qop	<p>Level of protection to use for the connection</p> <p>Possible values:</p> <ul style="list-style-type: none"> ■ 1: Authentication only ■ 2: Integrity protection ■ 3: Privacy protection (default) ■ 8: Use the value from <code>snc/data_protection/use</code> on the application server ■ 9: Use the value from <code>snc/data_protection/max</code> on the application server <p>Default: 3</p>	Optional
jco.client.snc_myname	<p>SNC name for SAP Convergent Charging application:</p> <p><code>p:CN=SAPCC, O=<MyCompany>, C=US</code></p>	<p>Optional, recommended</p> <p>Although this parameter is optional, we do recommend setting this value to make sure</p>

		that the correct SNC name is used for the connection.
jco.client.snc_partnername	Example: <code>p:CN=ABC, O=<MyCompany>, C=US</code>	Required You can find the application server's SNC name in the profile parameter snc/identity/as.

Legend: The SNC name does not correspond to the Distinguished Name you used when creating the PSE. The SNC name has the following syntax: `p:<Distinguished_Name>`.

Prerequisites

- The RFC destination has been created with the procedure relevant for your system landscape when installing the SAP CRM or SAP ERP / FI-CA systems for the *Convergent Invoicing* business scenario and the *Consume To Cash* value scenario.
- A security policy is defined for the landscape including the SAP CC Core Server system
- The public-key certificates have been exchanged (see the previous procedure)

Procedure

- Prepare the jco parameters
- To change the JCo configuration related to SAP ERP / FI-CA:
 - From SAP CC Core Server, export to a file the SNC parameters using the [Setup Tool](#) command-line program:
`setup sapci exportConfiguration -login=<LGN> -password=<PWD> <myfilename>`
 - Edit this file and change the values of the parameters for Secured Network Communication
 - Import these parameters using the command: `setup sapci importConfiguration -login=<LGN> -password=<PWD> <myfilename>`
- To change the JCo configuration related to SAP CRM:
 - From SAP CC Core Server, export to a file the SNC parameters using the [Setup Tool](#) command-line program:
`setup jcodestination export crm <myfilename>`
 - Edit this file and change the values of the parameters for Secured Network Communication
 - Import these parameters using the command: `setup jcodestination import crm <myfilename>`
- Restart all the dispatcher and bulkloader instances using the command: `sapcontrol -nr <instance_number> -host <host> -function start`
- Checks the logs for these instances of the Core Server

Result

The SAP CC Core Server system is up and running and can communicate with the SAP CRM and SAP ERP / FI-CA systems.

Maintaining the System ACL on SAP NetWeaver

Use

In addition to being able to identify its communication partner using the SNC layer, SAP NetWeaver uses a system Access Control List (ACL) to make sure that it is communicating with the correct components.

Procedure

To maintain the SNC system access control list (table SNCSYSACL, view VSNCSYSACL, type=E):

- Use the table maintenance transaction SM30
 - Enter SNC name for SAP Convergent Charging in the *SNC name* field. Make sure you enter the server's SNC name and not the Distinguished Name. The server's SNC name is the Distinguished Name prefixed with "p:"
 - The *System ID* field is optional
 - The option *Activate Entry for RFC* must be checked
 - The other entries are optional
- Save the data

Maintaining the Extended User ACL on SAP NetWeaver

Use

If users are logged on to the ABAP Engine using the secured JCo connection, then you must also maintain an entry in the extended user ACL (table USRACLEXT).

Procedure

To maintain the extended user ACL (table USRACLEXT):

- Use the table maintenance transaction SM30
 - Enter an asterisk (*) as a wildcard in the *User* field
 - Use the sequence number if you have multiple entries with the same user
 - Enter SAP Convergent Charging's SNC name in the SNC name field. Make sure you enter the server's SNC name and not the Distinguished Name. The server's SNC name is the Distinguished Name prefixed with "p:"
- Confirm the warning
- Save the data

System Settings for Communications via the Web Services

SAP Convergent Charging 3.0 provides a Web Services interface based on SOAP and HTTP standards.

Consult the procedure for [Setting up the Communications via the Web Services](#), see page [58].

In this integrated scenario, SAP CRM and SAP ERP act as consumers of these Web Services provided by the SAP CC Core Server System. A proxy is delivered within SAP CRM for each service.

Consult the configuration documentation for SAP CRM and SAP ERP components:

- If you change the URL or the port number settings of the SAP CC Core Server System, change the configurations of the activation of the Web Services in SAP CRM and SAP ERP with SOAMANAGER transaction
- If you enable HTTP Secured (HTTPS) connections, check that the public certificate(s) of SAP Convergent Charging 3.0 are in the secure store of ERP/CRM in SAP Netweaver



NOTES

- Details of communication as destination server, transport protocol, access credentials have to be setup according to the concrete system landscape. This setup is done using transaction SOAMANAGER.

- SOAMANAGER enables to create several *logical ports* with different configurations for each service. Use the logical port marked as default for communication between the systems. Refer to the SOAMANAGER documentation for more details.
- To maintain logical ports for the SAP CC Web Services in SOAMANAGER select the link *Web Service Configuration* from tab *Service Administration* and search the services by 'Consumer Proxy' and using either the external or internal name as search pattern. Refer to the SOAMANAGER documentation for more details.

Basic System Settings related to the Generation of Billable Items



NOTES

- This configuration is performed by *SAPinst* with appropriate default values.
- For a quick configuration, you do not need to change these system settings at initial installation time.

Billable Item Management

Use

SAP CC 3.0 is able to send billable items to SAP ERP Convergent Invoicing. Some configuration activities are necessary at installation time or later.

Prerequisites

The configuration for managing charged items or refill records is available.

Activities

- Set up the CIF for the Rater instances of Core Server [page [122](#)]
- Set up the CIF for the Bulkloader instances of the Core Server
- Set up the EIF

Result

- The Core Server is configured.
- You can configure master data for the service provider and:
 - Create billable item mapping with the SAP CC Core Tool (necessary charged item classes or refill record classes are automatically created) [page [184](#)]
 - Use the billable item mapping to customize a charge in a charge plan or in an offer or to customize the refill logic in a refill plan [page [107](#)]

Setting up the Rater Instances (CIF)

Use

SAP CC 3.0 generates temporarily charged item or refill record files. You can configure the file management for this function (path, multithreading, and roll over policy).

For managing errors, consult the *Operations Guide* on SAP Service Marketplace at the following location: ► <https://service.sap.com/instguidesc30> → Operate ◀ or ►

<https://service.sap.com/instguides> → SAP Business Suite Applications → SAP Convergent Charging3.0 → SAP CC 3.0 → Operate ↵.

**CAUTION**

Before being saved to files, SAP Convergent Charging validates the charged items and the refill records to make sure that they will be correctly converted into billable items.

Default Settings

These system configurations are automatically set up by *SAPinst* with default values.

Procedure

- Consult the template file (..\config\withCI\cif.rater.config.xml.sk) about these settings
- Export your current configuration from SAP CC:
`setup cif export -login=<LGN> -password=<PWD> rater <myfilename>`
- Change the parameters
- Import the new configuration:
`setup cif import -login=<LGN> -password=<PWD> rater <myfilename>`

Setting up the Bulkloader Instances (CIF)**Use**

SAP CC 3.0 loads into SAP ERP Convergent Invoicing the billable items extracted and converted from the charged item or refill record files. You can configure the file management for this function (path, multithreading, buffering, and file error management). The SAP JCo and RFC procedures provide the communication between SAP CC 3.0 and SAP Convergent Invoicing.

For managing errors, consult the *Operations Guide* on SAP Service Marketplace at the following location: ► <https://service.sap.com/instguidesc30> → Operate ↵ or ► <https://service.sap.com/instguides> → SAP Business Suite Applications → SAP Convergent Charging3.0 → SAP CC 3.0 → Operate ↵.

For configuring the conversion, consult the next section.

Default Settings

These system configurations are automatically set up by *SAPinst* with default values.

Procedure

- Consult the template file (..\config\withCI\cif.bulkloader.config.xml.sk) about these settings
- Export your current configuration from SAP CC:
`setup cif export -login=<LGN> -password=<PWD> bulkloader <myfilename>`
- Change the parameters
- Import the new configuration:
`setup cif import -login=<LGN> -password=<PWD> bulkloader <myfilename>`

Setting up the Default Field Mapping Between CIT and BIT (Implementation Project)**Use**

In this Customization activity, you can configure how SAP Convergent Charging generates some fields in the billable items (BIT) sent to SAP ERP / Convergent Invoicing.



To ease the configuration of the billable item mapping in SAP CC 3.0, it is recommended to create and maintain a list containing the fields defined in the billable item classes which are created in SAP ERP Convergent Invoicing.

For each field, you can set how it should be generated by default by SAP CC and if this field is mandatory in SAP CI so SAP CC can automatically add this field when the power user creates the new billable item mapping.

They are two generation categories:

- With a constant value
- With a base property from the rating and charging context. A base property is always calculated by SAP CC and identified with a technical key

This table lists the fields that can be generated by SAP CC and the ID of the key:

BIT Field	Status in BIT	Generation Method
SRCTATYPE	Mandatory	Constant value: CCCIT
SRCTAID		Property from rating and charging context: Key: itemSetIdSt
SUBPROCESS	Mandatory	Generated by SAP CC system  DO NOT MODIFY THIS ENTRY
BITTYPE	Mandatory	Generated by SAP CC system  DO NOT MODIFY THIS ENTRY
VKONT	Mandatory	Property from rating and charging context: Key: accountCode
GPART	Mandatory	Property from rating and charging context: External (Postpaid) Account ID Key: externalAccountCode
BITDATE	Mandatory	Property from rating and charging context: Key: eventDate
BITTIME	Mandatory	Property from rating and charging context: Key: eventDate
BITDATE_FROM		Property from rating and charging context: Key: recurringStart
BITDATE_TO		Property from rating and charging context: Key: recurringStop
BIT_AMOUNT	Mandatory	Property from rating and charging context: Key: baseAmount
BIT_CURR	Mandatory	Property from rating and charging context:

		Key: <code>currency</code>
POSTREL		Constant value: true
PRINTREL		Constant value: true
TAX_INCLUDED		Property from rating and charging context: Key: <code>taxVatGrossPriceFlag</code>
TAX_DET_TYPE		Constant value: 01
TAX_DATE_TYPE		This field is generated with no value: Key: <code>emptyString</code>
EXT_TAX_ID		Property from rating and charging context: Key: <code>taxVatRateCode</code>
XANZA		Constant value: false
PREPAID	Mandatory	Property from rating and charging context: Key: <code>isPrepaid</code>
PPACC	Mandatory	Property from rating and charging context: Key: <code>accountCode</code>
PPREFILL	Mandatory	Property from rating and charging context: Key: <code>isPrepaidRefill</code>
VTREF	Mandatory	Property from rating and charging context: Key: <code>contractId</code>
SUBAP	Mandatory	Property from rating and charging context: Key: <code>contractType</code>
CONTRACTITEMID	Mandatory	Property from rating and charging context: Key: <code>contractItemExternalId</code>

**CAUTION**

The definitions of billable item classes in SAP CI can change. Please maintain SAP CC according to your business. The Core Server must be restarted.

**NOTE**

In this configuration file, the keys `emptyString`, `emptyNumber` and `emptyDate` are used to force the generation of a field in the BIT with no value. The list of keys is available in the Javadoc in the *Core Server SDK* or at the following URL: <http://help.sap.com/javadocs/cc/cc30/> in the `pnr.tif.TransactionFieldBook.html` file.

Default Settings

SAP CC 3.0 is installed with the default mapping for several fields of the billable item. A template file is available in the configuration folders.

Activities

As technology consultant, you have to initiate this configuration according to the configuration of SAP CI.

As system administrator, you may have to update this configuration in SAP CC when a new field is created in SAP CI.

Prerequisites

- You know the configuration of billable item classes in SAP CI.
- You have the default_ci_ei_mapping.xml.sk file from an SAP CC installation. It is available in the folder: /usr/sap/<SYSTEM_ID>/CCD<INSTANCE_ID>/CC_CORE_SERVER/config/ci, or it can be exported from a running server using the [Setup Tool](#) and the `sapci` command.

Procedure

- Check with the SAP CC [Admin+ Tool](#) that the EIF_CONN_CLASS parameter has the value: `com.highdeal.eif.ci.CIConnector`
- Create a configuration file myDefaultFieldMapping.xml
- Verify and update the content of this file according to the configuration of billable item classes defined in SAP CI:
 - The XML schema is basic and mostly includes the `exportableItemMappingField` tag that identifies a field in the generated billable items, the default way it is generated by SAP CC and if it is mandatory:


```
<?xml version="1.0" encoding="UTF-8"?>
<exportableItemMapping externalSystemCode="CI">
  <!-- Field generated by default with a constant -->
  <exportableItemMappingField name="<FIELD1>">
    <additionalInformation name="constant" value="CCCIT" />
    <additionalInformation name="isMandatory" value="true" />
  </exportableItemMappingField>
  <!-- Field generated by default with a value computed by SAP CC -->
  <exportableItemMappingField name="<FIELD2>">
    <additionalInformation name="value" value="<KEYWORD>" />
    <additionalInformation name="isMandatory" value="true" />
  </exportableItemMappingField>
</exportableItemMapping>
```
 - For each `exportableItemMappingField` tag, add the `additionalInformation` tag with the name set to `constant` if SAP CC generates this field with a constant value or with the name set to `value` if SAP CC generates this field with a value computed during the rating or charging process according to the keyword.



EXAMPLE

By default, SAP CC can generate the fields named SRCTATYPE and VKONT in the billable items. SRCTATYPE is filled in with the constant string value "CCCIT" and VKONT is filled in with the property of the rating context that includes the identifier (code) of an external postpaid account defined in a subscriber account for the customer of a service provider.

By default, SAP CC can generate automatically a new charged item class when creating a new billable item mapping. The structure of this charged item class is similar to the structure of the billable item

class that is referred in the mapping. This charge item class will include fields named SRCTATYPE and VKONT. These fields are set up to produce the right data in the final billable item.

An extract of the default field level mapping configuration file can include the following rows:

```
<?xml version="1.0" encoding="UTF-8"?>
<exportableItemMapping externalSystemCode="CI">
  <exportableItemMappingField name="SRCTATYPE">
    <additionalInformation name="constant" value="CCCIT" />
    <additionalInformation name="isMandatory" value="true" />
  </exportableItemMappingField>
  <exportableItemMappingField name="VKONT">
    <additionalInformation name="value" value="externalAccountCode" />
    <additionalInformation name="isMandatory" value="true" />
  </exportableItemMappingField>
  ...
</exportableItemMapping>
```

- You may have to change some settings or add some field descriptions.



NOTE

The list of keywords is available in the Javadoc in the *Core Server SDK* or at the following URL: <http://help.sap.com/javadocs/cc/cc30/> in the pnr.tif.TransactionFieldBook.html file.

- Import this new configuration in SAP CC Core Server by using the [Setup Tool](#):
`setup sapci importDefaultMapping -login=<LGN> -password=<PWD>
 ..\config\withCI\myDefaultFieldMapping.xml`
- Restart all the instances of the Core Server

Checking the Updater Instances (EIF)

Use

SAP CC 3.0 exchanges information on billable item classes managed by SAP ERP Convergent Invoicing.



NOTE

SAP CC 3.0 includes a default mapping definition between fields generated by SAP CC and fields known by SAP ERP/FI-CA. You can customize this mapping as described in the customization section.

Default Settings

- These system configurations are automatically set up by *SAPinst* with default values.
- This system configuration should not be changed.

Procedure

- Launch the [Admin+ Tool](#)
- Check that the EIF_CONN_CLASS parameter has the value:
`com.highdeal.eif.ci.CIConnector`

System Settings for Notifications via JCo



NOTE

- This configuration is performed by *SAPinst*. You do not need to change these system settings at initial installation time.

In the integrated scenario with SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite, SAP Convergent Charging must send the following account balance management notifications via JCo:

- Amount alert
- Expiration alert



CAUTION

In this integrated scenario, do not set up a filter for notifications that will block the amount alert notifications or the expiration alert notifications (see page [61](#)).

SAP CC 3.0 uses the following JCo functions:

- SAP CRM: CRM_ISX_PPACC_ALERT_HANDLER
- SAP ERP: FKK_PREP_MESSAGE

Setting up the Notifications via JCo

Use

SAP CC 3.0 uses temporary data files for collecting all the notifications before sending them to the SAP CRM or SAP ERP system by calling a JCo function.

You can configure the technical management of these files according to the type of instance of the SAP CC Core Server:

Settings for all the Rater instances of the Core Server (Notification File Generation)

File Settings	Technical Name	Example
Root Path (Output)	rootPath	CC_AMOUNT_ALERT_NOTIF/Instance#@INSTANCE_ID@
Channel Count	channelCount	2
Max Size Based File Rollover Policy	timeBasedFileRolloverPolicy	1M
Time Based File Rollover Policy	timeBasedFileRolloverPolicy	HOURLY
Deflate	deflate	true

Auto Commit	autoCommit	false
-------------	------------	-------

Settings for the Bulkloader instances of the Core Server (File Transmission)

JCo Settings (*)	Technical Name	Example
Destination	destination	<ul style="list-style-type: none"> ■ crm ■ CI_DESTINATION
Function	function	<ul style="list-style-type: none"> ■ CRM_ISX_PPACC_ALERT_HANDLER ■ FKK_PREP_MESSAGE



(*) CAUTION

Do not change the values of the JCo settings.

File Settings	Technical Name (**)	Example
Root Path (Input)	rootPath	<ul style="list-style-type: none"> ■ CC_AMOUNT_ALERT_NOTIFICATION/Instance#@INSTANCE_ID@ ■ CC_EXPIRATION_ALERT_NOTIFICATION/Instance#@INSTANCE_ID@
Channel Count	channelCount	2
Buffer Size	bufferSize	1000
File Removal	removeFile	true



(**) NOTE

The technical names of these parameters have a prefix. By default the prefixes are:

- AMOUNT_ALERT_NOTIF_READER
- EXPIRATION_ALERT_NOTIF_READER

The files that cannot be transmitted are managed with the following parameters for the Bulkloader instances:

File Error Management

File Settings	Technical Name	Example
Root Path (Output)	rootPath	CC_NOTIF_ERR/Instance#@INSTANCE_ID@
Channel Count	channelCount	2

Max Size Based File Rollover Policy	maxSizeBasedFileRolloverPolicy	1M
Time Based File Rollover Policy	timeBasedFileRolloverPolicy	HOURLY
Deflate	deflate	false
Auto Commit	autoCommit	true

**NOTE**

Consult the *Parameter Reference* for more details (see page [\[37\]](#)).

Default Settings

- *SAPinst* set up the SAP CC Core Server system to activate the publication of notifications.
 - By default, the notifications are sent to the SAP CRM system (when part of the landscape).
- *SAPinst* uses default values from template files for the configuration (see files: notification_policy.rater.xml.sk, notification_policy.bulkloader.crm.xml.sk, notification_policy.bulkloader.xml.sk, bulkloader_policy.xml.sk)

Prerequisites

You have installed your landscape with *SAPinst*

Procedure

- Determine the notification policies configured for each type of instance of the Core Server
- Access to the template files (see default settings) located in the directory:
`/usr/sap/<SYSTEM_ID>/CCD_<INSTANCE_ID>/exe/CC_CORE_SERVER/config/`

**NOTE**

You can consult the *Parameter Reference* for details (see page [\[37\]](#)).

- Change the configuration for the Rater instances of the Core Server
 - Export the current notification settings for the Rater instances of the Core Server by using the Setup Tool:
`setup notificationpolicy export -login=<LGN> -password=<PWD>
 <myraternotifpolicy> rater`
 - Edit and change the exported file
 - Save this file
 - Import the changed file:
`setup notificationpolicy import -login=<LGN> -password=<PWD>
 <myraternotifpolicy> rater`
- Change the configuration for the Bulkloader instances of the Core Server
 - Export the current settings for the Bulkloader instances of the Core Server by using the Setup Tool:
`setup bulkloader export -login=<LGN> -password=<PWD>
 <mybulkloaderpolicy>`
 - Edit and change the exported file
 - Save this file

- Import the changed file:

```
setup bulkloader import -login=<LGN> -password=<PWD>
<mybulkloaderpolicy>
```
- Export the current notification settings for the Bulkloader instances of the Core Server by using the Setup Tool:

```
setup notificationpolicy export -login=<LGN> -password=<PWD>
<mybulkloadernotifpolicy> bulkloader
```
- Edit and change the exported file
- Save this file
- Import the changed file:

```
setup notificationpolicy import -login=<LGN> -password=<PWD>
<mybulkloadernotifpolicy> bulkloader
```

- Restart the server

**CAUTION**

- Do not change the structures of the exported configuration files.
- The values of the Root Path parameters must be consistent:
 - Check that the AMOUNT_ALERT_NOTIF_WRITER_ROOT_PATH parameter corresponds to the same physical directory than the AMOUNT_ALERT_NOTIF_READER_ROOT_PATH parameter.
 - Check that the EXPIRATION_ALERT_NOTIF_WRITER_ROOT_PATH parameter corresponds to the same physical directory than the EXPIRATION_ALERT_NOTIF_READER_ROOT_PATH parameter.

You can also use the Admin+ Tool.

Setting up the Network Notifications (Implementation Project)

Use

You can optionally set up SAP Convergent Charging so it publishes ABM notifications and administrative notifications to the network.

Notification Groups	Notifications	Publication via JCo	Publication on Network
Account Balance Management Notifications (ABM)	Amount alert	Mandatory	Optional
	Expiration alert	Mandatory	Optional
	User defined alert (*)	Not possible No user defined alert is sent to the SAP CRM and SAP ERP systems	Optional
Administrative	All (*)	Not possible	Optional

Notifications		No administrative notification is sent to the SAP CRM and SAP ERP systems	
---------------	--	---	--

**(*) NOTE**

In SAP CC 3.0, the user defined alert notifications and the administrative notifications are not sent via JCo. SAP CRM and SAP ERP cannot manage this kind of notifications. You can handle these notifications by customizing and developing a handler application based on Java. See the section Publishing Notifications for detail about this implementation task (see page [72](#)).

Prerequisites

- You have determined a concept for the notification policy management
- The notification function has been implemented in your landscape by your project team and consultants and a Java based application is able to retrieve the notifications published by SAP CC on the network (see page [72](#))

Default Settings

SAPinst does not activate the publication of notifications on the network.

**CAUTION**

SAPinst uses the template files:

- notification_policy.bulkloader.crm.xml.sk
- notification_policy.bulkloader.xml.sk

They are available in the configuration folder:

```
/usr/sap/<SYSTEM_ID>/CCD_<INSTANCE_ID>/exe/CC_CORE_SERVER/config/ci/
```

During the patch or the update procedures, the content of the configuration folder is reset with the appropriate files. Do not save permanently your modifications in these template files.

In an integrated scenario with both SAP CRM and SAP ERP, only the SAP CRM will receive the notifications from SAP CC.

Procedure

Export the notification configuration files and insert the `<network/>` element.

**EXAMPLE: CONFIGURATION FILE FOR THE RATER INSTANCES**

You can insert the `<network/>` element after the definition of the filters:

```
<?xml version="1.0" encoding="UTF-8"?>
<notificationPolicy>
```

```

<sequence>
  <nameFilter pattern="AMOUNT_ALERT">
    <argumentFilter name="balanceType" pattern="prepaid">
      <bulkWriter adminParameterPrefixName="AMOUNT_ALERT_NOTIF_WRITER"
rootPath="CC_AMOUNT_ALERT_NOTIF/Instance#@INSTANCE_ID@" channelCount="2"
      timeBasedFileRolloverPolicy="HOURLY"
maxSizeBasedFileRolloverPolicy="1M" deflate="true" autoCommit="false" />
    </argumentFilter>
  </nameFilter>
  <nameFilter pattern="EXPIRATION_ALERT">
    <bulkWriter adminParameterPrefixName="EXPIRATION_ALERT_NOTIF_WRITER"
rootPath="CC_EXPIRATION_ALERT_NOTIF/Instance#@INSTANCE_ID@" channelCount="2"
    timeBasedFileRolloverPolicy="HOURLY" maxSizeBasedFileRolloverPolicy="1M"
deflate="true" autoCommit="false" />
  </nameFilter>
  <network />
</sequence>
</notificationPolicy>

```



EXAMPLE: CONFIGURATION FILE FOR THE BULKLOADER INSTANCES

You can insert the **<network/>** element in the definition of the filter:

```

<?xml version="1.0" encoding="UTF-8"?>
<notificationPolicy>
  <nameFilter pattern="^AMOUNT_ALERT$|^EXPIRATION_ALERT$"
    <JCo destination="crm" function="CRM_ISX_PPACC_ALERT_HANDLER">
      <bulkWriter adminParameterPrefixName="NOTIF_WRITER"
rootPath="CC_NOTIF_ERR/Instance#@INSTANCE_ID@" channelCount="2"
      timeBasedFileRolloverPolicy="HOURLY" maxSizeBasedFileRolloverPolicy="1M"
deflate="false" autoCommit="true" />
    </JCo>
    <network />
  </nameFilter>
</notificationPolicy>

```

Business Customizing

This section details the data customizations that are relevant for the integrated scenario with SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite.



NOTE

You have to customize some data according to the stage of the implementation project: Consult first the list of activities recommended on page [\[44\]](#).

Setting up the SAP Currency

Use

SAP CC 3.0 is able to manage SAP currency for the following functions:

- Pricing Implementation: the master data can use SAP Currency in all the decision trees
- Rating and Charging: at runtime, the system performs the calculations according to the SAP currencies
- Refilling: at runtime, the system performs the calculations according to the SAP currencies

You can have to manually maintain the SAP currencies known by SAP Convergent Charging by synchronizing the list with the SAP ERP/FI-CA system.



RECOMMENDATION

We recommend creating the secondary currency that relates to the precision of the rating calculations by SAP Convergent Charging: By default, you should create [EUR6](#).



NOTES

- You can manage the currencies in Customizing for SAP NetWeaver under: **General Settings** → **Currencies**.
- For more details about the process to generate billable items, consult the *Technical Reference Guide for SAP CC 3.0*.
- If the rating precision of SAP Convergent Charging differs from 6, you should create the appropriate secondary currencies. For example: [EUR4](#).

Default Settings

At the first successfully launch, the SAP CC Core Server system retrieves information from the SAP ERP/FI-CA system and stores this data in the Core Database.

Prerequisites

- Your integrated scenario includes the SAP ERP/FI-CA component of the SAP Business Suite
- The SAP currencies are up-to-date in the SAP ERP system

Procedure

- Create [EUR6](#) in SAP NetWeaver
- Launch the SAP CC [Core Tool](#) and log on
- Re-synchronize the SAP currencies: **SAP CC** → **Core Tool** → **Tools** → **Currencies** → **Synchronizing currencies**

Result

The SAP currencies known by SAP Convergent Charging are up-to-date and stored in the Core Database. All the relevant instances of the Core Server are updated in a short time.

Customizing the Rerating Function with BART

Use

In this *Customizing Activity*, you can configure the retention period for the rerating function with BART. You must configure both the SAP CC Core Server system and the SAP CC BART Server system. These settings must be performed at installation time.

Prerequisites

- Your *Business Scenario* includes only postpaid accounts in a batch mode environment
- The SAP CC BART Server system must be installed and configured (see the chapter about the BART Server)
- The reversal of billable items is allowed in SAP ERP/FI-CA

Default Settings

- In this scenario integrated with SAP Convergent Invoicing (SAP ERP/FI-CA) of the SAP Business Suite, the rerating function is
- This function is disabled in the standard system installation

Activities

- Determine the retention period required for your business to provide rerating services, see on page [81]
- Change the retention period for SAP CC Core Server, see on page [81]
- Change the keeping days for BART Server, see on page [201]

More Information

Consult the *Technical Reference Guide* on SAP Service Marketplace at the following location: <https://service.sap.com/instguidesc30> → Plan or <https://service.sap.com/instguides> → SAP Business Suite Applications → SAP Convergent Charging → SAP CC 3.0 → Plan.

In the ERP, consult the SAP Customizing Implementation Guide > Financial Accounting (New) > Contract Accounts Receivable and Payable > Integration > Billing in Contract Accounts Receivable and Payable > Reversal of Billable Items > Make Basic Settings.

Result

An SAP CC administrator can use the rerating function from the SAP CC Core Tool to fix exceptional mistakes in the master data of the service provider (price plans, tables) or in the master data of the customers (subscriber accounts, provider contracts, subscriptions).

Master Data Basic Settings

This section details specific settings relevant for the configuration of the master data for the service provider. This master data is stored in one or several catalogs.

Setting up the Master Data of the Service Provider

Use

In this integrated end-to-end scenario with SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite, the pricing in SAP CC includes some dedicated tasks.

Prerequisites

Before creating Master Data, the following elements are mandatory:

- The 3 systems (SAP CRM, SAP CC, and SAP ERP) from the SAP Business Suite are up and running and configured for this integrated scenario.
- SAP users with relevant roles are created for setting up the technical catalog for service providers.

- Relevant master data is created in the SAP CRM and in the SAP ERP/FI-CA systems.
 - Create and generate a BIT-class.
 - Create all data (properties like sub process and billing process).

Procedure

From SAP CC Core Tool:

Configuration Tasks	Configuration Recommendation
<p>Determine the content and the format of the <i>Chargeable Items</i> that will be sent to SAP CC for the usage of a marketable service by an end customer.</p> <p>You can have different categories if you have several services (voice, SMS, MMS, internet) or a unique convergent format.</p>	Preparation
<p>Model the <i>Chargeable Item Classes</i> that should be configured in SAP CC:</p> <ul style="list-style-type: none"> ■ What information must be present in the incoming charged items ■ What properties must be used by the rating and charging policy ■ What information must be expected by an external billing system 	Preparation
<p>Determine the content and the format of the <i>Refill Items</i> that will be sent to SAP CC for the refill services.</p> <p>Some information elements must be transmitted to the billing functions (SAP ERP/FI-CA).</p>	Preparation
<p>Model the <i>Refill Item Classes</i> that should be configured in SAP CC</p>	Preparation
<p>Identify the key information elements for the pricing, charging, and refilling policies:</p> <ul style="list-style-type: none"> ■ Allowances (refillable units) ■ Shared counters in the future contracts ■ Parameters to be set in the contracts 	Preparation
<p>Model the global pricing policy with charges and charge plans, refill logic and refill plans:</p> <ul style="list-style-type: none"> ■ Rating and charging policy ■ Refilling policy (how to credit units or amounts, how to use these free units) 	Preparation
<p>Model the necessary counters that should be visible in SAP CRM:</p> <ul style="list-style-type: none"> ■ For the management of refillable units ■ For other purpose <p>These counters must be declared in the charge plans and in the refill plans.</p>	Preparation

Configuration Tasks	Configuration Recommendation
Check that the necessary <i>Billable Item Classes</i> are available in the SAP ERP/FI-CA system	Preparation
<p>Check that the <i>Refillable Units</i> and the <i>Refill Packages</i> are defined in the Billable Item Classes are available in the SAP ERP/FI-CA system</p> <p><i>In the ERP system view the refillable units in Customizing for Contract Accounts Receivable and Payable under Prepaid Processing -> Refills -> Define Refillable Units.</i></p> <p><i>View the refill packages in the ERP system in Customizing for Contract Accounts Receivable and Payable under Prepaid Processing -> Refills -> Define Refill Packages.</i></p>	Preparation
Determine the output data details that should be generated by SAP CC in billable items after the rating and charging functions	Preparation
Determine the output data details that should be generated by SAP CC in billable items after the refilling function	Design
Create a catalog for the service provider	Base Configuration
Import a specific mapping table class named <i>Price Table</i>	Base Configuration <i>Data Settings for Price Management with SAP CRM</i>
<p>Create and set up the necessary chargeable item classes</p> <p><i>Create first a chargeable item package</i></p>	Base Configuration
Create and set up the billable item mapping (each field) with an associated charged item class	Base Configuration
Check and set up these charged item classes (each field)	Base Configuration
<p>Create and set up a first version of the necessary reusable charges that will be added and customized in charge plans visible in SAP CRM:</p> <ul style="list-style-type: none"> ■ Set up the persistent counters ■ Set up the parameters ■ Set up the price plan ■ Set up the charging plan 	<p>Master Data Raw Configuration</p> <p><i>Data Settings for Recurring Fee and Recurring Refill Management</i></p> <p><i>Data Settings for Price Management with SAP CRM</i></p> <p><i>Data Settings for Synchronizations with Bill Cycles in SAP ERP/FI-CA</i></p>
Create the appropriate counter name dictionary (Admin role) that includes the names of all the counters that are visible from the SAP CRM system	Master Data Raw Configuration
Model a first version of the necessary charge plans	Design

Configuration Tasks	Configuration Recommendation
Create and set up each charge plan	Master Data Raw Configuration <i>Data Settings for Synchronizations with Bill Cycles in SAP ERP/FI-CA</i>
Add and customize charges in each charge plan	Master Data Raw Configuration <i>Data Settings for Synchronizations with Bill Cycles in SAP ERP/FI-CA</i> <i>Data Settings for Recurring Fee and Recurring Refill Management</i>
Set up the charged item generation in the customized charges of the charge plans You can output a lot of elements from the rating context: properties, counters, parameters...	Master Data Raw Configuration
Create and set up the billable item mapping (each field) with an associated charged item class	Base Configuration
Check and set up the refill record class (each field)	Master Data Raw Configuration
Create a specific translation table that includes the configuration of the refill packages as defined in the SAP ERP system	Base Configuration
Create and set up a first version of the necessary reusable refill logic that will be added and customized in a refill plans visible in SAP CRM: <ul style="list-style-type: none"> ■ Set up the persistent counters ■ Set up the parameters ■ Set up the logic for the refill and reversal of refill management 	Master Data Raw Configuration <i>Data Settings for Recurring Fee and Recurring Refill Management</i> <i>Data Settings for Price Management with SAP CRM</i> <i>Data Settings for Synchronizations with Bill Cycles in SAP ERP/FI-CA</i>
Model a first version of the necessary refill plan	Design
Create and set up the refill plan	Master Data Raw Configuration
Add and customize refill logic in the refill plan	Master Data Raw Configuration
Set up the refill record generation in the refill logic customized in a refill plan You can output a lot of elements from the rating context: properties, counters, parameters...	Master Data Raw Configuration


Configuration Tasks	Configuration Recommendation
Test your charges, refill logic, charge plans and refill plans Update these objects	Configuration Test
Transport your objects in the test landscape that include the SAP CRM and SAP ERP components interfaced with SAP CC	Configuration Test
Release the charge plans and the refill plans	Finalization

Data Settings for Recurring Fee and Recurring Refill Management

Use

In this integrated end-to-end scenario, you use SAP Convergent Charging to model some automated and periodic operations for recurring fees and recurring refills.

When designing the following master data for the service provider, you have to perform some specifics settings:

Topic	Master Data	Specific Data Settings	Condition
Recurring Fee	Charge	Price management If you model some recurring fees, you have to configure the charges in SAP CC so they use the price conditions defined in SAP CRM.	Mandatory
		Billing cycle correlation management If you want to take into account the billing cycle information (defined in SAP ERP/FI-CA) in the configuration of your recurring fees and recurring refills, you can use a dedicated parameter named SAP_BILL_CYCLE_DATE. It is created by default in the charge plans and in the refill plans in SAP CC.  EXAMPLE You can synchronize the recurring fees with the billing cycles for each customer. SAP CC will trigger the fees a couple of days before the coming billing cycle date.	Optional
Recurring Refill	Refill Logic	Billing cycle correlation management	Optional



NOTE

When adding recurring rates in a price plan of a charge, you can also set up the charging function by adding a charging refill component in the charging plan of this charge. For more information about Recurring Charging, see in SAP Help Portal at: <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → Logic Components → Charging components → [Recurring Charging](#).

Activities

The configuration of the master data for the service provider includes the following activities detailed in the next sections:

- Data Settings for Price Management with SAP CRM
- Data Settings for Synchronizations with Bill Cycles in SAP ERP/FI-CA

Data Settings for Price Management with SAP CRM

Use

In this integrated end-to-end scenario, you use SAP Convergent Charging to model some recurring fees. These fees are based on prices and price conditions that are managed by SAP CRM at the product level.

To model recurring fees in your charges and charge plans, you have to use a particular mapping table class that is named `Price Table`. SAP CRM is responsible for converting price conditions into price table instances and for replicating and maintaining these instances in SAP CC. SAP CC stores in the catalog these instances as mapping tables.



NOTES

- For more information about Prices for SAP Customer Relationship Management (SAP CRM), see SAP Help Portal at: <http://help.sap.com> → *SAP Business Suite* → *SAP Customer Relationship Management* → *Application Help* → *Master Data* → *Products* → *Functions* → *Prices* ↩.
- You can create and use other mapping table classes and mapping tables than the price table, but they will not be managed by SAP CRM.
- For more information about data distribution mechanism in this integrated scenario, see the SAP CRM Library from SAP Help Portal at: <http://help.sap.com> → *SAP Business Suite* → *Customer Relationship Management* → *SAP EHP 2 for SAP CRM 7.0* → *Application Help* → *English* → *SAP CRM for Industries* → *Telecommunications* → *Functions for the Telecommunications Industry* → *Products* → *Price Conditions for Distribution to SAP CC* ↩.

Prerequisites

You have installed SAP CRM and SAP ERP/FI-CA components of the SAP Business Suite

Activities

With the Core Tool you will:

- Set up one catalog of the service provider with a mapping table class for the price table management
- Set up the charges that include recurring rates in their price plan so that they use this particular mapping table class
- Set up the charge plans with 2 particular parameters. The SAP CRM system will set up these parameters in the related contract item. The values will be the key of the price and the ID of the mapping table to be used for the product corresponding to the provider contract.



NOTES

- For more information about this configuration of master data for the service provider in SAP

Convergent Charging, see the SAP Library for SAP CC 3.0 from SAP Help Portal at the following location: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → Charges → Using SAP CRM Prices in Recurring Charges ◀.

- For more recommendations about price key determination in SAP CRM, see the *Cross Catalog Mapping* section from the *Configuration Guide for SAP CRM 7.0 Enhancement Package 2* available for the *SAP for Telecommunications* business scenario *Sales and Order Management*: ► *Basic Settings for SAP for Telecommunications Business Scenarios* → *Recommendations for Setting Up Integration with SAP Convergent Charging* → *Cross Catalog Mapping* → *Price Key Determination* ◀.

Data Settings for Synchronizations with Bill Cycles in SAP ERP/FI-CA

Use

To be able to manage the bill cycles in SAP ERP/FI-CA, you can have to correlate or synchronize all the recurring fees and recurring refills configured in SAP Convergent Charging. These configurations are part of the master data for the service provider and they are applicable for the customers of this service provider.

You have to configure specifically the following objects in SAP CC:

- Charges and charge plans
- Refill logic and refill plans

Prerequisites

You have implemented an integrated scenario with SAP ERP/FI-CA component of the SAP Business Suite



NOTES

- For more information about integration with SAP ERP/FI-CA, see the SAP Library for SAP ERP Enhancement Packages. Consult the SAP Help Portal at: ► <http://help.sap.com> → SAP ERP → SAP ERP Central Component → SAP ERP Enhancement Packages → ERP Central Component Enhancement Package 5 → Industries in SAP ERP → SAP Telecommunications → Billing-Account-Based Billing → Billing → Processes and Functions of Billing → [Billing Cycle](#) ◀.
- For more information about data replication mechanisms in this integrated scenario, see the SAP CRM Library from SAP Help Portal at: ► <http://help.sap.com> → SAP Business Suite → Customer Relationship Management → SAP EHP 1 for SAP CRM 7.0 → Application Help → English → SAP CRM for Industries → Telecommunications → Functions for the Telecommunications Industry → Order and Contract Processing in the Interaction Center → Billing Cycle and Determination Rules ◀.

Activities

With the Core Tool, you will:

- Configure your charges
 - When creating a charge with a recurring rate, add a parameter (date format) in the price plan
 - Set up the recurring rates so they use this parameter as Reference Date for triggering the fees
- Configure your charge plans
 - Add these charges in your charge plans

- Link their parameters with a parameter declared by default in the charge plan (see the SAP_BILL_CYCLE_DATE parameter in the online Help of the Core Tool)
- The same activities are relevant with a refill logic and a refill plan

**NOTE**

For more information about this configuration of master data for the service provider in SAP Convergent Charging, see the SAP Library for SAP CC 3.0 from SAP Help Portal at the following location: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → Charges → [Synchronizing recurring fees with SAP CI billing cycles](#) ◀.

Data Settings for One-Off Fees

Use

The one-off charges must be configured in SAP CRM. There are two exceptions for which you can insert one-shot rates in your price plans in SAP CC:

- Technical reason:
 - You need to reset some counters declared in the charges
- Pricing modeling reason:
 - You need to base the price calculation on counters that are updated after consumption of the service (usage) or during periodical updates (recurring)

**NOTE**

For more information about one-off charges created in SAP CRM and distributed to SAP ERP, see in SAP Solution Manager or in SAP Help Portal at: ► <http://help.sap.com/> → SAP Business Suite: Documentation for SAP Solution Manager Content → ST ICO 150: Configuration → Scenario and Process Configuration → SAP for Telecommunications: Configuration Documentation → [One-Off Charges](#) ◀.

Setting up a Refill Item Class

Use

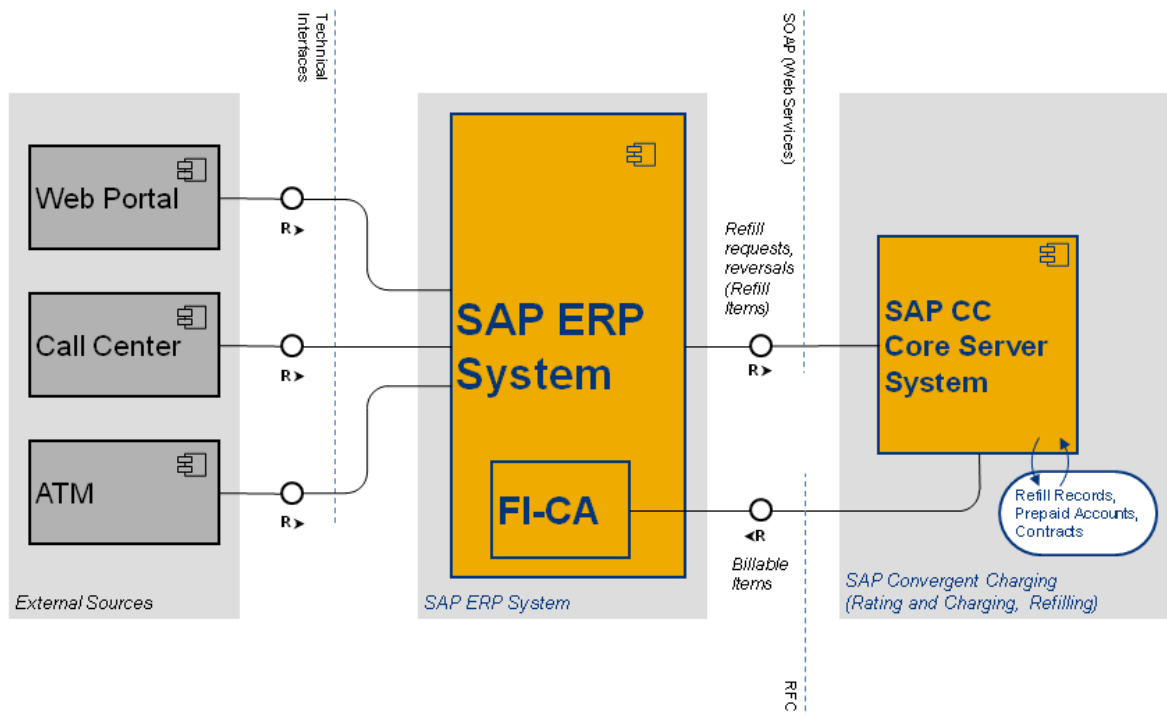
In this integrated end-to-end scenario with SAP ERP and SAP ERP/FI-CA components of the SAP Business Suite, SAP CC receives refill items from the SAP ERP system, processes this data and sends resulting billable items to SAP ERP/FI-CA.

Refills can either be credits posted to a prepaid account or free units, as for example free minutes. Refill packages can define up to three types of refillable units (for example, free minutes, free SMS, and free amounts of data for download) as well as an amount for the prepaid account.

You have to configure the refill item classes in SAP Convergent Charging to define the input properties that you can use in the refill logic or that must be transmitted to SAP ERP/FI-CA as billing system.


**RECOMMENDATION**


A single refill item class can be configured in SAP CC for the management of refills and reversals of refill.



Refill management: data flow

The SAP ERP system triggers a refill and reverses a refill by sending a request to the SAP CC Core Server system. The typical messages are:

Incoming Message	Description	Comment
Refill Request	<p>The SAP ERP system triggers a refill by defining the amount to credit to the prepaid account.</p> <p> NOTES</p> <ul style="list-style-type: none"> ■ This original amount can be modified by SAP CC when performing the refilling process ■ No refillable unit can be set up 	<p>You have to configure the refill logic and a refill plan that will be used at runtime to define the behavior of SAP CC.</p>

Incoming Message	Description	Comment
Refill Request for Refill Based on Packages	<p>The SAP ERP system triggers a refill by referring to a refill package that determines the refillable units and the refill amount to credit to the prepaid account.</p> <p> NOTES</p> <ul style="list-style-type: none"> ■ This original refill amount can be modified by SAP CC when performing the refilling process ■ The original free unit numbers can be modified by SAP CC when performing the refilling process 	You have to configure the refill logic and a refill plan that will be used at runtime to define the behavior of SAP CC.
Reversal of Refill Request	The SAP ERP system reverses a refill already processed.	<p>The same kind of message is used to reverse a classical refill or a refill based on a package.</p> <p>The reversal message includes the amount and the refillable units refilled by SAP CC previously.</p> <p>You have to configure the refill logic that will be used at runtime to define the behavior of SAP CC.</p>

For more information about the origins of the refill requests, see the *Integration Guide for the Order-to-Cash End-to-End Process*.

These messages include refill items that have a common structure detailed in the table:

Data Property in Incoming Refill Items	Description	Format	Scope	Availability in Refill Request	Availability in Refill Reversal Request
Refill Date	Date of the refill request	Date/Time	Refill management	Mandatory	Yes

Data Property in Incoming Refill Items	Description	Format	Scope	Availability in Refill Request	Availability in Refill Reversal Request
Refill Amount	<i>Refill Amount</i>	Values: <i>0: refill based on refill packages</i> <i>Positive: amount to credit</i> <i>Negative: reversal</i>	Refill management: <i>Used by the refill logic in SAP CC to compute the final refill amount that is credited to the balance of the prepaid account</i> Reversal management: <i>Used by the refill logic in SAP CC to update properly the balance of the prepaid account</i>	Mandatory <i>Can differ from the final amount credited after the execution of the refill process by SAP CC</i>	Mandatory <i>The refill amount finally credited to the prepaid account</i>
Refill Currency	<i>Refill Currency</i>	String	<i>Used by SAP CC to check that the refill currency is the same than the currency of the prepaid account</i>	Mandatory	Mandatory
PPRSN	<i>Reason for Balance Change on Prepaid Account</i>	String	Refill management Reversal management Bonus management for refills: <i>You can use the input value to determine the appropriate bonus policy</i> <i>Ex: 01, 05 or 11</i>	Mandatory	Mandatory
CRDRS	<i>Reason for Free Increase of Prepaid Balance</i>	String		Mandatory	Mandatory
TUSE1	<i>Refillable Unit (Component 1)</i>	String	Refill package management only	Conditional	No
TUSE2	<i>Refillable Unit (Component 2)</i>	String	Refill package management only	Conditional	No
TUSE3	<i>Refillable Unit (Component 3)</i>	String	Refill package management only	Conditional	No
CNTU1	<i>Number Executed (Component 1)</i>	Number	Refill package management only	Conditional	No

Data Property in Incoming Refill Items	Description	Format	Scope	Availability in Refill Request	Availability in Refill Reversal Request
CNTU2	<i>Number Executed (Component 2)</i>	Number	Refill package management only	Conditional	No
CNTU3	<i>Number Executed (Component 3)</i>	Number	Refill package management only	Conditional	No
REFPK (*)	<i>Reference of the Package</i>	String	Refill package management only	Conditional	No
RFPCN (*)	<i>Number of Refill Packages</i>	String	Refill package management only	Conditional	No
PPDOC (*)	<i>Posting Document for Prepaid Account in FI-CA</i>	String			
PPNOT (*)		String			
TUMTH (*)	<i>Refill Method</i>	String			
TULOC (*)	<i>Point of Sale for Prepaid Credit</i>	String			
BKVID (*)	<i>Bank Details ID</i>	String			
CRDID (*)	<i>Payment Card ID</i>	String			
CGUID (*)	<i>Key for Payment Card Supplement</i>	String			
XRVRF (*)	<i>Decrease of Prepaid Credit or Units</i>	String			
PREPR (*)	<i>Reference Number Used for the Refill</i>	String			

For more general information about a refill item class, see [Setting up Refill Item Classes](#) on page [98].

For more information about these messages, see the SAP CC Library from SAP Help Portal at: <http://help.sap.com/cc> → SAP CC 3.0 → Development Information → SOAP → Refill Management → [Refill a Prepaid Account](#).



NOTE (*)

Some of these incoming properties must be transmitted to SAP ERP/FI-CA in the output data (billable items):

- BKVID
- PPNOT

- CRDID
- CGUID
- PPDOD
- PREPR
- REFPK
- RFPCN
- TULOC
- TUMTH
- XRVRP

You must set up these configurations when creating a refill plan:

- Define the *Refill Record Mapping* of the refill logic customized in the refill plan. This mapping includes the configuration of the generation of temporary refill records that are converted into billable items and sent to SAP ERP / FI-CA.

Prerequisites

- You have checked that the SAP ERP system sends refill items compliant with this structure. No customized property is sent.
- If customized properties are sent, you have determined the scope of these incoming data, how SAP CC should manage this data and how this data are expected by SAP ERP / FI-CA.

Procedure

To create and set up the relevant refill item class:

- Study the input data (refill items) from the SAP ERP system
- Model the refill item class
- Create the refill item class with the SAP CC Core Tool
 - Add the following properties:

Property in the Refill Item Class	Description	Format
Refill Date	Date of the refill request	Date/ Time
Refill Amount	Refill Amount	Number
Refill Currency	Refill Currency	String
PPRSN	Reason for Balance Change on Prepaid Account	String
CRDRS	Reason for Free Increase of Prepaid Balance	String
TUSE1	Refillable Unit (Component 1)	String
TUSE2	Refillable Unit (Component 2)	String
TUSE3	Refillable Unit (Component 3)	String
CNTU1	Number Executed (Component 1)	Number
CNTU2	Number Executed (Component 2)	Number
CNTU3	Number Executed (Component 3)	Number
REFPK	Reference of the Package	String
RFPCN	Number of Refill Packages	String

Property in the Refill Item Class	Description	Format
PPDOC	Posting Document for Prepaid Account in FI-CA	String
PPNOT		String
TUMTH	Refill Method	String
TULOC	Point of Sale for Prepaid Credit	String
BKVID	Bank Details ID	String
CRDID	Payment Card ID	String
CGUID	Key for Payment Card Supplement	String
XRVRF	Decrease of Prepaid Credit or Units	String
PREPR	Reference Number Used for the Refill	String

Result

You can use this class to create the refill logic.

[illegible]

**NOTE**

Consult the customizing of SAP ERP to determine if other fields are present in the refill items sent to SAP CC to trigger the refills.

Setting up a Refill Record Class and the Associated Billable Item Mapping

Use

In this integrated end-to-end scenario, SAP CC produces temporary refill records as result of the refilling process. It converts this data onto billable items and sends them to SAP ERP/FI-CA.

You have to configure the generation of these refill records and billable items:

- The first step is to create the billable item mapping that defines the conversion, and to create the associated refill record class.
- The second step is to finalize the configuration in the refill plans when adding the refill logic: In the *Refill Record Mapping* you will have to set up the sources of the generated properties:
 - Default property calculated by SAP CC
 - Particular property computed during the execution of the refill logic

**RECOMMENDATION**

SAP AG recommends using the automated creation of refill record classes when creating the billable item mapping in the SAP CC Core Tool.




**NOTE**



During the implementation project, you can customize this automated creation of a refill record class. Consult the implementation activity with your project team about [Setting up the Default Field Mapping Between CIT and BIT \(Implementation Project\)](#), see page [139].

For a prepaid scenario, the following properties are expected by SAP ERP/FI-CA:

Property	Source	Value in Refill Record Class	Refill Record Mapping	Must be Set by the Refill Logic?
SRCTATYPE	Constant	'CCCIT'	n/a	No
SRCTAID	Default Property Calculated by SAP CC	Set ID of Refill Records	n/a	No
SUBPROCESS	List from CI	'TPRF'	n/a	No

Property	Source	Value in Refill Record Class	Refill Record Mapping	Must be Set by the Refill Logic?
BITTYPE	List from CI	'RFL_'	n/a	No
PREPAID	Default Property Calculated by SAP CC	Account Type is Prepaid	n/a	No
PPREFILL	Default Property Calculated by SAP CC	Charged Transaction is a Prepaid Refill	n/a	No
VKONT	Default Property Calculated by SAP CC	External (Postpaid) Account ID in SAP CC	n/a	No
GPART	Default Property Calculated by SAP CC	Subscriber Account ID in SAP CC	n/a	No
VTREF	Default Property Calculated by SAP CC	Provider Contract ID in SAP CC	n/a	No
VTPOS		-Unset-		
SUBAP	Default Property Calculated by SAP CC	Contract Type	n/a	No
PPACC	Default Property Calculated by SAP CC	Prepaid Account ID in SAP CC	n/a	No
BILL_BASEDATE		-Unset-		
BILL_FIRST		-Unset-		
BITDATE	Default Property Calculated by SAP CC	x	n/a	No
BITTIME	Default Property Calculated by SAP CC	x	n/a	No
BITDATE_FROM	Default Property Calculated by SAP CC	Start of Refill Recurring Period	n/a	No
BITDATE_TO	Default Property Calculated by SAP CC	Stop of Refill Recurring Period	n/a	No

Property	Source	Value in Refill Record Class	Refill Record Mapping	Must be Set by the Refill Logic?
BIT_AMOUNT	CC Calculated Property and Modified by the Refill Logic	Base Amount  This amount is the final refill amount computed by the execution of the relevant refill logic.	n/a	YES  To be set up in the refill logic
BIT_CURR	Default Property Calculated by SAP CC	Currency of the Refill	n/a	No
TAX_INCLUDED	Default Property Calculated by SAP CC	Tax is Included in Total Amount	n/a	No
TAX_DET_TYPE	Constant	'01'	n/a	No
EXT_TAX_DATE		-Unset-		No
EXT_TAX_ID	Default Property Calculated by SAP CC	VAT Transaction Rate Code	n/a	No
BITREF32		-Unset-		No
PY_GROUP		-Unset-		No
BITTEXT50	Property from Input Data (Refill Item) <i>Different input property name and output property name</i>	-Unset- <i>To be set in the refill record mapping</i>	PPNOT	No
BKVID	Property from Input Data (Refill Item)	-Unset- <i>To be set in the refill record mapping</i>	BKVID	No
CNTU1 (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_CNTU1</i>	YES  To be set up in the refill logic
CNTU1_REQ (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_CNTU1_REQ</i>	YES

Property	Source	Value in Refill Record Class	Refill Record Mapping	Must be Set by the Refill Logic?
CNTU2 (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_CNTU2</i>	YES
CNTU2_REQ (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_CNTU2_REQ</i>	YES
CNTU3 (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_CNTU3</i>	YES
CNTU3_REQ (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_CNTU3_REQ</i>	YES
CRDID	Property from Input Data (Refill Item)	-Unset- <i>To be set in the refill record mapping</i>	CRDID	No
CRDRS (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_CRDRS</i>	YES  To be set up in the refill logic
PCARD_GUID32	Property from Input Data (Refill Item) <i>Different input property name and output property name</i>	-Unset- <i>To be set in the refill record mapping</i>	CGUID	No
PPAMOUNT_REQ (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_PPAMOUNT_REQ</i>	YES  To be set up in the refill logic
PPDOC	Property from Input Data (Refill Item)	-Unset- <i>To be set in the refill record mapping</i>	PPDOC	No

Property	Source	Value in Refill Record Class	Refill Record Mapping	Must be Set by the Refill Logic?
PPRSN (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_PPRS</i>	YES
PREPR	Property from Input Data (Refill Item)	-Unset- <i>To be set in the refill record mapping</i>	PREPR	No
REFPK	Property from Input Data (Refill Item)	-Unset- <i>To be set in the refill record mapping</i>	REFPK	No
RFPCN	Property from Input Data (Refill Item)	-Unset- <i>To be set in the refill record mapping</i>	RFPCN	No
TULOC	Property from Input Data (Refill Item)	-Unset- <i>To be set in the refill record mapping</i>	TULOC	No
TUMTH	Property from Input Data (Refill Item)	-Unset- <i>To be set in the refill record mapping</i>	TUMTH	No
TUSE1 (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_TUSE1</i>	YES
TUSE3 (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_TUSE2</i>	YES
TUSE3 (*)	Particular Property Computed During the Execution of the Refill Logic	-Unset-	<i>computed_TUSE3</i>	YES
XRVR	Property from Input Data (Refill Item)	-Unset- <i>To be set in the refill record mapping</i>	XRVR	No

**NOTE (*)**

Some properties of the refill record class are unset and cannot be set up to properties declared in the refill item class. You must design the refill logic to generate these properties.

For more information about a *Billable Item Mapping*, see the SAP CC Library in SAP Help Portal at: <http://help.sap.com/cc> → SAP CC 3.0 → Application Help → Core Tool → Billable Item Mapping → Working with the Billable Item Mapping → [Creating with the Billable Item Mapping](#).

Prerequisites

- The SAP CC Core Server System is configured for this integrated scenario

Procedure

By default, SAP CC creates the billable item mapping relevant for you with the associated refill record class.

- Check the properties declared in the billable item mapping. These properties will be generated in the billable items:
 - Check the properties that are filled in with a constant value: You can modify the value
 - Check the properties that are filled in with a property from the refilling context in SAP CC: It is not necessary to change these properties
 - Check the properties that remain unset: You will have to define the generation method when setting up the refill plan that includes the refill logic referencing this refill record class



EXAMPLE

- The billable item mapping defines the following properties that will be generated by SAP CC in the billable items:
 - SRCTATYPE 'CCCIT'
 - SRCTAID Set ID of Refill Records/Charged Items
 - SUBPROCESS 'TPRF'
 - BITTYPE 'RFL_'
 - PREPAID Account Type is Prepaid
 - PPREFILL Charged Transaction is a Prepaid Refill
 - VKONT External (Postpaid) Account ID in SAP CC
 - GPART Subscriber Account ID in SAP CC
 - VTREF Provider Contract ID in SAP CC
 - SUBAP Contract Type
 - PPACC Prepaid Account ID in SAP CC
 - BITDATE Event Date
 - BITTIME Event Date
 - BITDATE_FROM Start of Refill Recurring Period
 - BITDATE_TO Stop of Refill Recurring Period
 - BIT_AMOUNT Base Amount (modified by the refill logic)
 - BIT_CURR Currency of the Refill
 - TAX_INCLUDED Tax is Included in Total Amount
 - TAX_DET_TYPE '01'
 - EXT_TAX_ID VAT Transaction Rate Code
- The following properties will be generated by SAP CC in the billable items but are not set in this billable item mapping and must be set in a refill plan when customizing the refill logic:
 - CNTU1, EXT_TAX_DATE, VTPOS, BILL_BASEDATE, BILL_FIRST

Result

The billable item mapping and a refill record class are available. You can set up the refill logic.



NOTE

Note that the following properties are not set in the billable item mapping but must be set up when customizing the refill logic in a refill plan:

- CNTUi and CNTUi_REQ
- TUSEi
- CRDRS
- PPAMOUNT_REQ
- PPRSN

We recommend designing the refill logic so it generates some new properties:

- computed_CNTUi and CNTUi_REQ
- computed_TUSEi
- computed_CRDRS
- computed_PPAMOUNT_REQ
- computed_PPRSN

Setting up the Refill Logic

Use

In this integrated end-to-end scenario, you must design the refill logic that will define the behavior of SAP CC for the refills of prepaid accounts.



RECOMMENDATION

Create and set up the refill logic with the multicurrency option enabled to simplify the configuration data in SAP CC.

Procedure: Determine the Scope of the Refill Logic

Define the scope of the refill logic you must configure for the service provider as part of the pricing implementation:

- Determine if you need to manage periodic refills
- Determine if you need to manage initial refills
- Determine if you need to manage refill packages as configured in the SAP ERP system
- Determine if you need to manage “bonus” to give an extra credit amount or free units for certain refills

Refill Package Management	Bonus Management	Refill Reversal Management	Refill Logic Configuration
---------------------------	------------------	----------------------------	----------------------------

	Refill Package Management	Bonus Management	Refill Reversal Management	Refill Logic Configuration
Request for refill	Yes	Yes	Yes	You must add two <i>Usage Refill</i> components in the refill logic
Automated Periodic Refill (*)	Yes	Yes <i>The refill logic must set the output CRDRS property to the constant 'BONUS'</i>	n/a	You must define some <i>Recurring Refill</i> components in the refill logic
Automated Initial Refill (*)	n/a	Yes <i>The refill logic must set the output CRDRS property to the constant 'INITIAL'</i>	n/a	You must define a <i>One-shot Refill</i> component in the refill logic

**NOTE (*)**

SAP Convergent Charging triggers the recurring refills and the one-shot refills only when it receives a request to refill a prepaid account. The relevant billable items are not generated until the processing of this refill request.

Procedure: Determine the Refillable Units

Determine the refillable units that the refill logic must handle as allowances.

**EXAMPLE**

Free minutes, free SMS, free amounts of data for downloads

Get the list of refillable units declared in the SAP ERP system in *Customizing* for Contract Accounts Receivable and Payable under: ► Prepaid Processing → Refills → Define Refillable Units ◀.

**NOTE**

For each refillable unit you will have to:

- Declare a persistent counter in the refill logic that can be linked to a future counter declared in the refill plan
- Create a counter name in the counter dictionary
- Declare a counter in the refill plan
- Design the logic that will refill these units
- Design the charge logic that will base the price computation with these units

Procedure: Create the Counter Names

Create the necessary counter names with the SAP CC Core Tool.

**NOTE**

Use these names to declare your counters in a refill plan and in the necessary charge plans.

**EXAMPLE**

With the SAP CC Core Tool, you can set up the following counter names:

- FREE_SMS
- FREE_MINUTES

You are able to design a refill plan by declaring two counters.

Procedure: Setting up the Translation Table for the Refill Packages

Create and set up a translation table dedicated to the refill management based on refill packages. This table must be maintained synchronously to the definition of the refill packages in the SAP ERP system. This translation table must be used in the refill logic.

- Determine the refill packages defined in the SAP ERP system in *Customizing* for Contract Accounts Receivable and Payable under: ► Prepaid Processing → Refills → Define Refill Packages ◀.
- With the SAP CC Core Tool, create a translation table in the catalog of the service provider
- Set up the table schema:
 - Define a single input column named **REFPK** (the reference of the refill package)
 - Define the output columns: You need a column for each free refillable unit and one output column for the free amount to credit
- Setup the table instance with values declared in the SAP ERP system for the refill packages

For more information about a *Translation Table*, see the SAP CC 3.0 Library from SAP Help Portal at the following location: ► <http://help.sap.com/cc> → SAP CC 3.0 → Application Help → Core Tool → Translation Tables → Working with Translation Tables → [Setting up a Translation Table](#) ◀.

You must use this translation table in the refill logic by inserting a *Table Operator* component in the logic.

For more information on how to use a translation table in the logic, see the SAP CC Library in the SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Application Help → Core Tool → Logic Components → Refill Logic Components → About Refill Logic Components → Operators → [Table Operator](#) ◀.

**EXAMPLE**

With the SAP CC Core Tool, you can set up the following translation table:

- Input Column:
 - REFPK

- Output Columns:
 - FREE_REFILL_AMOUNT
 - FREE_SMS
 - FREE_MINUTES

You are able to set up the following table instance:

RFPK	FREE_REFILL_AMOUNT	FREE_SMS	FREE_MINUTES
RFPACK1	0	100	0
RFPACK2	0	100	200
RFPACK3	10	100	0
RFPACK4	10	100	200
RFPACKJPY1	0	100	0
RFPACKJPY2	0	100	200
RFPACKJPY3	1000	100	0
RFPACKJPY4	1000	100	200

Data Settings for the Expected Properties Generated by the Refill Logic


You have to configure how SAP Convergent Charging fills in the following properties in the billable items:

Property of the Billable Items That are Set by the Refill Logic	Description
TUSE1 TUSE2 TUSE3	Name or ID of the Refillable Unit as defined in the SAP ERP system
CNTU1 CNTU2 CNTU3	Value of the Refillable Unit (Number Executed) <i>For each refillable unit</i>
CNTU1_REQ CNTU2_REQ CNTU3_REQ	Requested Number <i>For each refillable unit</i>
PPAMOUNT_REQ	Requested Change of Credit
CRDRS	Reason for Free Increase of Prepaid Balance
PPRSN	Reason for Balance Change on Prepaid Account
BIT_AMOUNT	Base Amount


**RECOMMENDATION**

You can set up the refill logic to generate new computed properties that can be used to configure the generation of billable items (and temporary refill records) when the refill logic is customized in a refill plan.

The refill logic must create the following properties:

Property Generated by the Refill Logic	Usage Refill	Reversal	Recurring Refill	One-shot Refill
Refillable Unit ID: <i>computed_TUSE1</i> <i>computed_TUSE2</i> <i>computed_TUSE3</i>	<p>The refill logic must identify the refillable units that have been changed. The identifier is a string compliant with the declaration in the SAP ERP system.</p> <p><i>Ex.: FREE_MIN</i></p> <p>Normal refill request:</p> <p><i>Set by the refill logic only if bonus management</i></p> <p>Based on refill package:</p> <p><i>Set by the refill logic from refill package information</i></p>	<p><i>Copied by the refill logic from input (TUSEi)</i></p>		
Refillable Unit Value: <i>computed_CNTU1</i> <i>computed_CNTU2</i> <i>computed_CNTU3</i>	<p>Normal refill request:</p> <p><i>Set by the refill logic only if bonus management</i></p> <p>Based on refill package:</p> <p><i>Set by the refill logic from package information</i></p> <p><i>Bonus management applied</i></p>	<p>Set by the refill logic:</p> <p><i>Final value of the refill unit(s) debited</i></p> <p>Format: Negative values</p> <p> EXAMPLE</p> <p><i>Copied from input (CNTUi) if corresponding counter threshold is fine</i></p> <p><i>You must customize the behavior in case of counter error: current value of the counter is lower than value to debit</i></p>		

Property Generated by the Refill Logic	Usage Refill	Reversal	Recurring Refill	One-shot Refill
Requested Number: <i>computed_CNTU1_REQ</i> <i>computed_CNTU2_REQ</i> <i>computed_CNTU3_REQ</i>	Normal refill request: <i>n/a</i> Based on refill package: <i>Set by the refill logic from refill package information</i> <i>Bonus management not applied</i>	<i>Copied by the refill logic from input (CNTUi)</i>		
Requested Change of Credit: <i>computed_PPAMOUNT_REQ</i>	Normal refill request: <i>Set by the refill logic: Copied from input (Refill Amount)</i> Based on refill package: <i>Set by the refill logic from refill package information</i> <i>Bonus management not applied</i>	<i>Copied by the refill logic from input (Refill Amount)</i>		
Reason for Free Increase of Prepaid Balance: <i>computed_CRDRS</i>	Normal refill request: <i>Copied by the refill logic from input (CRDRS)</i> <i>Exception: BONUS in case of bonus applied on the refill amount</i> Based on refill package: <i>Copied by the refill logic from input (CRDRS)</i> <i>Exception: BONUS in case of bonus applied on the refill amount</i>	<i>Copied by the refill logic from input (CRDRS)</i>	Set by the refill logic: <i>'BONUS' in case of bonus applied on the refill amount credited</i>	Set by the refill logic: <i>'INITIAL' (initial refill only)</i>
Reason for Balance Change on Prepaid Account <i>computed_PPRSN</i>	Normal refill request: <i>Copied by the refill logic from input (PPRSN)</i> Based on refill package: <i>Copied by the refill logic from input (PPRSN)</i>	<i>Copied by the refill logic from input (PPRSN)</i>	Set by the refill logic: <i>'02'</i>	Set by the refill logic: <i>'16' (initial refill only)</i>

Property Generated by the Refill Logic	Usage Refill	Reversal	Recurring Refill	One-shot Refill
Base Amount	<p>Normal refill request:</p> <p><i>Set by the refill logic</i></p> <p><i>Bonus management applied on the input amount (Refill Amount)</i></p> <p>Based on refill package:</p> <p><i>Set by the refill logic from refill package information</i></p> <p><i>Bonus management applied</i></p>	<p>Set by the refill logic:</p> <p><i>Final value of the prepaid balance debited</i></p> <p>Format: Negative value</p> <p> EXAMPLE</p> <p><i>Copied from input (Refill Amount) if corresponding balance threshold is fine</i></p> <p><i>You must customize the behavior in case of failure: balance is lower than value to debit</i></p>		

You must insert a *Property Introducer* component in the logic to generate new computed properties that can be used to configure the generation of billable items (and temporary refill records) when customizing the refill logic in a refill plan (see the refill record mapping).

For more information on how to create new properties in the refill context, see the SAP CC Library of SAP CC in the SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Application Help → Core Tool → Logic Components → Refill Logic Components → About Refill Logic Components → Operators → [Property Introducer](#) ◀.

Procedure: Set up the Logic

In the SAP CC Core Tool, create the refill logic:

- In the *Definition* tab, declare the refill item class that is used by the refill logic
- In the *Parameters* tab, declare the parameters you want to use in the instructions of the logic
- Declare the persistent counters you want to handle in the logic
 - Declare a counter for each refillable unit you want to manage
- To finalize the configuration of the refill logic, you must perform the relevant procedures according to your preparations:
 - Setting up a Usage Refill for the Management of Refills Triggered by the SAP ERP System
 - Setting up a Usage Refill for the Management of Reversals
 - Setting up a Recurring Refill Triggered Automatically
 - Setting up a One-shot Refill at the Creation of a Contract

Setting up a Usage Refill for the Management of Refills Triggered by the SAP ERP System

Use

You have to insert and set up a *Usage Refill* component in the refill logic to configure the behavior of SAP CC when it receives a refill request triggered by the SAP ERP system.

- You must set up the usage identifier of this usage refill to the dedicated value: `_refill_`
- You must design the refill logic to produce the necessary computed properties listed above
- You can design the refill logic to manage potential bonus (additional refill amount, additional free units)

For more information about the refill logic and the usage refill, see the SAP CC Library in the SAP Help Portal at: <http://help.sap.com/cc> → SAP CC 3.0 → Application Help → Core Tool → Logic Components → Refill Logic Components → Refill Components → [Usage Refill](#) ↩.

Prerequisites

- You have configured the appropriate *Refill Item Class* in SAP CC for this service provider
- You are setting up the refill logic

Procedure

- Insert a *Usage Refill* in the refill logic
- In the *Definition* tab, set the *Usage Identifier* to: `_refill_`
- Design the logic in case of refill based only on refill amount not null (normal refill)
 - Determine the value of the `computed_PPAMOUNT_REQ` property



EXAMPLE

You can take into account the amount of the prepaid account balance to change the refill amount to be credited.

- Design the logic in case of bonus management:

You can use the input value of *PPRSN* (Reason for Balance Change on Prepaid Account) to determine the appropriate bonus policy (Ex.: 01, 05 or 11)

Set the relevant `computed_TUSEi` properties to the appropriate identifiers of the refillable units

Set the necessary `computed_CNTUi` properties to the appropriate total numbers of free units

Use a *Function* component to set the final refill amount that takes into account a bonus amount

- Design the logic in case of refill package management (received refill amount is null)
 - Check that the reference of the refill package (incoming property `PREFPK`) is known by SAP CC and retrieve the definition of the package
 - Set the relevant `computed_TUSEi` properties to the appropriate identifiers of the refillable units as declared in the SAP ERP system
 - Set the necessary `computed_CNTUi_REQ` properties to the appropriate total numbers of free units by taking into account the incoming property `RFPCN`

- Set the `computed_PPAMOUNT_REQ` property to the appropriate total amount of credit by taking into account the incoming property `RFPCN`
- Design the logic in case of bonus management:

Set the necessary `computed_CNTUi` properties to the appropriate total numbers of bonus units: $\text{computed_CNTUi} = \text{computed_CNTUi_REQ} + \text{bonus}$

Use a *Function* component to set the final refill amount that takes into account a bonus: $\text{final amount} = \text{computed_PPAMOUNT_REQ} + \text{bonus amount}$

- Set the property `computed_PPRSN` with the value of the input property `PPRSN` (declared in the refill item class): SAP CC does not change the value in case of refill request
- Set the property `computed_CRDRS` with:
 - The constant 'BONUS' in case of bonus applied on the refill amount
 - The value of the input property `CRDRS` (declared in the refill item class)
- Update the relevant counters related to the refillable units

Setting up a Usage Refill for the Management of Reversals

Use

You must insert and set up a *Usage Refill* component in the refill logic to configure the behavior of SAP CC when the SAP ERP system reverses a refill.

- You must set up the usage identifier of this usage refill to the dedicated value: `_reverse_refill_`
- You must design the refill logic to produce the necessary computed properties listed above:
 - The properties `computed_CNTUi_REQ` and `computed_PPAMOUNT_REQ` must include the original values of the reversal triggered by the SAP ERP system
 - The refill amount and the `computed_CNTUi` properties must include the final values by taking into account the possible issues
- You can design the refill logic to manage possible issues: The prepaid account balance or a counter corresponding to a refill unit may not be sufficient.

For more information about the refill logic and the usage refill, see the SAP CC Library in the SAP Help Portal at: <http://help.sap.com/cc> → SAP CC 3.0 → Application Help → Core Tool → Logic Components → Refill Logic Components → Refill Components → [Usage Refill](#) ↩.

Prerequisites

- You have created and configured the appropriate *Refill Item Class* is available in SAP CC for this service provider
- You have inserted and configured the usage refill for refill management in the refill logic

Procedure

- Insert a *Usage Refill* in the refill logic
- In the *Definition* tab, set the *Usage Identifier* to `_reverse_refill_`
- Copy the input data as output data:

- Set the property `computed_CRDRS` with the value of the input property `CRDRS` (declared in the refill item class): SAP CC does not change the value in case of reversal of refill
- Set the property `computed_PPRS` with the value of the input property `PPRS` (declared in the refill item class): SAP CC does not change the value in case of reversal of refill
- Set the relevant `computed_TUSEi` properties with the value of the input properties `TUSEi` (declared in the refill item class): SAP CC does not change the value in case of reversal of refill
- Set the necessary `computed_CNTUi_REQ` properties with the value of the input properties `CNTUEi` (declared in the refill item class): SAP CC does not change the value in case of reversal of refill
- Set the `computed_PPAMOUNT_REQ` property with the value of the input default property `Refill Amount` (declared in the refill item class): SAP CC does not change the value in case of reversal of refill
- Design the logic to configure the behavior of SAP CC in case of issues (insufficient funds):
 - Set the `computed_CNTUi` properties with the negative values finally reversed
 - Update the relevant counters related to the refillable units by reusing the `computed_CNTUi` properties
 - Use a *Function* component to set the final refill amount reversed (negative value)

**EXAMPLE**

The SAP ERP system reverses 5 EUR refill. The balance of the prepaid account is less. As configured in the refill logic, SAP Convergent Charging confirms a reversal of 4 EUR and decreases the balance to 0.

- Initial refill request: 5 EUR
- Incoming refill amount to be reversed: -5 EUR
- Refill amount finally reversed: -4 EUR

Setting up a Recurring Refill Triggered Periodically

Use

You have to insert and set up a *Recurring Refill* component in the refill logic to configure a periodic behavior of SAP CC.

**NOTES**

- If you want to reset periodically the value of a counter dedicated to a refillable unit, check that the corresponding counter is not already reset within a charge plan dedicated for this use case (counter sharing in provider contracts). See the [Recommendations for the Initialization of Counters Shared in Provider Contracts](#) on page [110].
- If you reset the values of the counters dedicated to the refillable units, determine if you must design the refill logic to set up the `computed_CNTUi_REQ` and `computed_CNTUi` properties.

For more information about the refill logic and the recurring refill, see the SAP CC Library in the SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Application Help → Core Tool → Logic Components → Refill Logic Components → Refill Components → [Recurring Refill](#) ◀.

Procedure

- Insert a *Recurring Refill* in the refill logic

Setting up a One-Shot Refill for the Creation of the Contract

Use

You must insert and set up a *One-shot Refill* component in the refill logic to configure the behavior of SAP CC when creating a provider contract of an end customer.

- You must set up the base event to: *Activation*
- You must design the refill logic to produce the necessary computed properties:
 - The `computed_CRDRS` property must be set to **INITIAL**
 - The `computed_PPRSN` property must be set to **16**
 - The `computed_PPAMOUNT_REQ` property must be set to the initial refill amount
- You can design the refill logic to set the initial value of the refillable units



NOTES

- If you want to set up initial value for the refillable units, be sure that the corresponding counters are not already initialized within a charge plan dedicated for this use case (counter sharing in provider contracts). Check also that they are not initialized within a charge plan that deals with recurring fees at the beginning of periods. See the [Recommendations for the Initialization of Counters Shared In Provider Contracts](#) on page [110].
- If you initialize the counters dedicated to the refillable units, determine if you must design the refill logic to set up the `computed_CNTUi_REQ` and `computed_CNTUi_REQ` computed properties.

For more information about the refill logic and the one-shot refill, see the SAP CC Library in the SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Application Help → Core Tool → Logic Components → Refill Logic Components → Refill Components → [One-Shot Refill](#) ◀.



EXAMPLE

You can set up the refill logic and the refill plan to be able to define an initial refill amount in each provider contract. Create the necessary parameters `INITIAL_REFILL_ENABLED` and `INITIAL_REFILL_AMOUNT`.

Procedure

- Insert a *One-shot Refill* in the refill logic
- In the *Definition* tab, set the *Event Name* to *Activation*

- Design the logic to introduce the necessary computed properties
- Design the logic to set these computed properties:
 - Set the `computed_CRDRS` property to the constant text: **INITIAL**
 - Set the `computed_PPRSN` property to the constant text: **16**
 - Set the `computed_PPAMOUNT_REQ` property with the appropriate refill amount. You can use a parameter that would be redefined in the refill plan and in the provider contract.
 - Use the value of the input default property `Refill Amount` (declared in the refill item class): SAP CC does not change the value in case of reversal of refill
- End each branch with a *Function* component that defines the initial refill amount that will be credited to the balance of the prepaid account

Setting up a Refill Plan

Use

In this integrated end-to-end scenario, you must design a refill plan that will define the behavior of SAP CC for the refills of prepaid accounts.

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Refill Plans ◀. You can access to the online Help from the graphical user interfaces.

Prerequisites

- The counter dictionary is up-to-date
- The relevant master data is available in the catalog of the service provider:
 - The refill record class and its associated billable mapping
 - The refill logic as recommended in this chapter

Procedure

- Insert the declarations of the counters related to the refillable units
- Insert the declarations of other counters that can be shared in a provider contract
- Insert the parameters and their default values and the conditions of use
- Insert the declaration of the account assignment expected in the contracts for the subscription to this refill plan: The prepaid account
- Declare the technical data that is used to identify an end customer: The phone numbers
- Insert and customize the refill logic
 - Link the necessary counters
 - Link the necessary parameters
 - Link the account assignment
 - In the *Technical Data* tab, insert a service identifier named **refill** and link it to the technical data defined in the refill plan
 - Configure the generation of refill records

Output Property	Property Computed by the Refill Logic	Input Property Declared in the Refill Item Class	Other Settings
BILL_BASEDATE			Empty

Output Property	Property Computed by the Refill Logic	Input Property Declared in the Refill Item Class	Other Settings
BILL_FIRST			Empty
BITREF32			Empty
BITTEXT50		PPNOT	
BKVID		BKVID	
CNTU1	computed_CNTU1		
CNTU1_REQ	computed_CNTU1_REQ		
CNTU2	computed_CNTU2		
CNTU2_REQ	computed_CNTU2_REQ		
CNTU3	computed_CNTU3		
CNTU3_REQ	computed_CNTU3_REQ		
CRDID		CRDID	
CRDRS	computed_CRDRS		
EXT_TAX_DATE			Empty
PCARD_GUID32		CGUID	
PPAMOUNT_REQ	computed_PPAMOUNT_REQ		
PPDOC		PPDOC	
PPRSN	computed_PPRS		
PREPR		PREPR	
PY_GROUP			Empty
REFPK		REFPK	
RFPCN		RFPCN	
TULOC		TULOC	
TUMTH		TUMTH	
TUSE1	computed_TUSE1		
TUSE2	computed_TUSE2		
TUSE3	computed_TUSE3		
VTPOS			Empty
XRVR		XRVR	

Data Settings for Converting Charged Items and Refill Records into Billable Items

■ Setting up the Billable Item Mapping

- Billable Item Mapping
- Charged Item Class
- Refill Record Class
- Setting up the Charged Item Mapping
- Setting up the Refill Record Mapping
- Maintaining the Billable Item Mapping
 - Billable Item Mapping
 - Charged Item Class
 - Refill Record Class

Setting up Billable Item Mapping

Use

In this integrated end-to-end scenario, SAP Convergent Charging uses the billable item mapping to configure how the system generates billable items to SAP Convergent Invoicing (SAP CI) in SAP ERP system. This object is part of the master data of the service provider. It describes the mapping between a billable item class (defined in SAP ERP / FI-CA) and a charged item class (or refill record class) defined in SAP CC.

By default, SAP CC 3.0 generates billable items according to a dedicated source transaction type: CCCIT. The source transaction ID has the value of the Charged Item Set ID or the Refill Record Set ID.



NOTE

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Billable Item Mapping ◀.

You can access to the online Help from the graphical user interface.

Prerequisites

SAP ERP/FI-CA is up and running

Procedure

- Start the Core Tool and log on
- Create the billable item mapping object and save it in the database: ► Core Tool → File → New → Billable Item Mapping

Setting up a Charge Plan

Use

In this integrated end-to-end scenario, you must design a charge plan that will define the behavior of SAP CC because this charge plan will be referenced in a contract item of the provider contracts of end customers. As only the charge plans are visible in SAP CRM, you must define your policy to design this master data. You can design some charge plans dedicated to the charging of customer consumption (service usage) and you can design some charge plans dedicated to the recurring fees and to the reset of technical counters.

Prerequisites

- The counter dictionary is up-to-date
- The relevant master data is available in the catalog of the service provider:
 - The charged item class and its associated billable mapping
 - The charges

Activities

Consult the online Help of the Core Tool in SAP Help Portal at: ► <http://help.sap.com/cc> → SAP CC 3.0 → Core Tool → About Refill Plans ◀. You can access to the online Help from the graphical user interfaces.

Master Data Maintenance

Maintaining the Billable Item Mapping

Use

After the billable item class is assigned to the “released as productive” status, the user can change the billable item class in the SAP ERP system (SAP Convergent Invoicing) by adding some optional fields at the end of the structure. In some business cases, it is necessary that the power user takes these changes into account so that SAP Convergent Charging can generate the new version of billable items.



NOTE

For more information about how to configure the interfaces for managing billable item classes, see the SAP Library for SAP ERP Enhancement Packages. Consult the SAP Help Portal at: ► <http://help.sap.com> → SAP ERP → Central Component → Enhancement Packages → Industries in SAP ERP → SAP Telecommunications → Billing in Contract Accounts Receivable and Payable → Integration of SAP Convergent Charging ◀.

Procedure: Preparations

Perform the following preparations:

- In SAP ERP/FI-CA:
 - Determine the changes to do in the billable item class (ex.: adding a field)
 - Determine if the configuration of SAP CC must be updated according to its final use and the way to fill it in
- In SAP CC:
 - Identify the billable item mapping to change with the Core Tool and the charged item class (or the refill record class) that is referred by this mapping as source
 - Identify the price plan, the charging plan, or the refill logic to update if necessary so that SAP CC is capable to generate the content of the new field for the billable items



EXAMPLE

Three new fields are added to a billable item class.

- By default, SAP CC can generate the content of the first field.
- SAP CC can generate the content of the second field by filling it in with a property already existing in the rating context.
- To generate the third field, the power user has to add a new parameter in the price plans and change the decision tree to define the calculation algorithm for this parameter. Then this parameter will be used in the modification of the charged item classes (or refill record

classes).

Procedure: Maintenance of the Billable Item Mapping

To update the billable item mapping and associated configurations after the billable item class has been changed in SAP CI:

- Launch the SAP CC Core Tool and log on
- Open the billable item mapping that is now obsolete
 - Identify the charged item class that is referred
 - Select the root node of the tree and click the *Refresh* button:
The new field(s) should appear in the structure.
 - Save the changes
- Open the charged item class (or refill record class) identified previously:
 - Add some new field(s) to this class. The field name must be the same as the one in the billable item mapping previously updated:
► *Core Tool* → *File* → *Open* → *Charged Item Class* or ► *Core Tool* → *File* → *Open* → *Refill Record Class*
 - Set up this field according to your business.
You can set the appropriate property or let the power user decide what to do at the offer or charge/refill plan level.
 - Save the changed class to the database
- Open again the billable item mapping to finalize the maintenance:
 - Select the new field(s) and, as a *Source*, select the field created in the charged item class (or refill record class)
 - Save the changes
- Change all the relevant charge plans, refill plans and offers:
 - Update all the offers that include customized charges using this charged item class: ► *Core Tool* → *File* → *Open* → *Offer*
 - Update all the charge/refill plans that include customized charges using this charged item class or refill record class: ► *Core Tool* → *File* → *Open* → *Charge Plan*
 - For each customized charge in such a charge plan, refill plan or offer, select the charge, and click the *Refresh* button on the *Charged Item* tab. A new field appears.
 - Set up this field onto the appropriate property or value source if it is relevant, and update the price plans, charging plans, and refill logic if necessary so that they produce the right data.
 - Save these charge plans, refill plans, and offers to the database



NOTE

For testing purposes, the power user must create the new billable item mapping when the structure of a billable items has changed. You must update all the charges in the charge plans and offers.



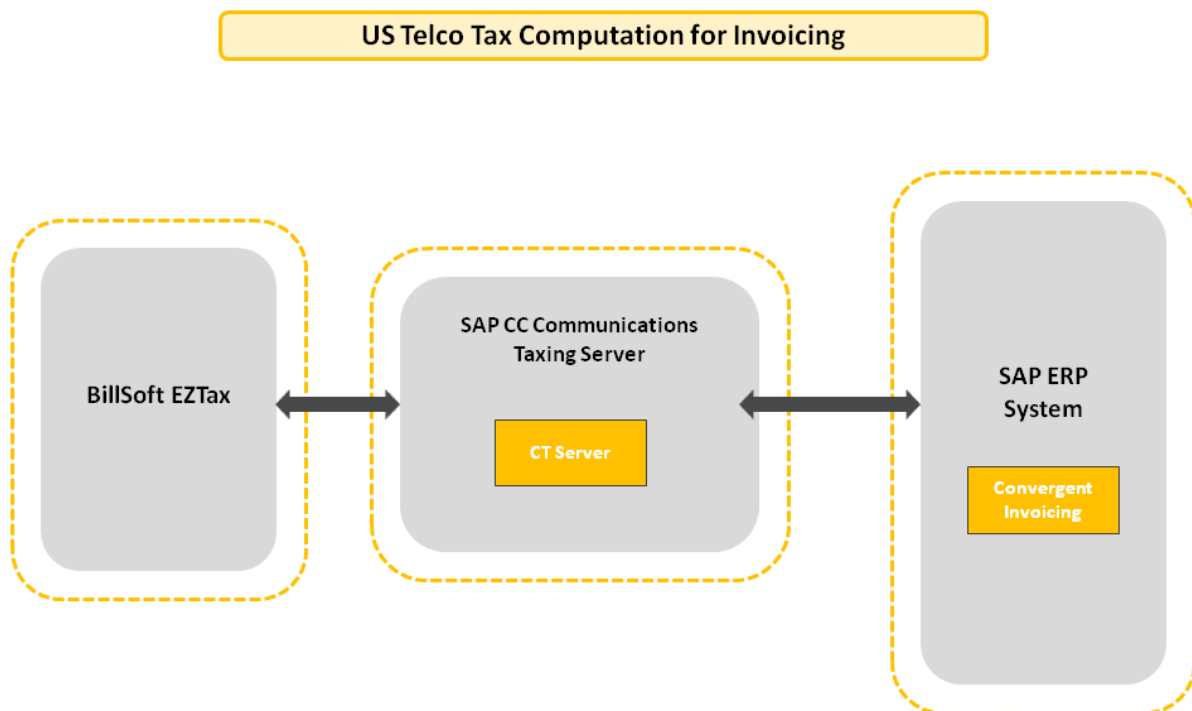
TIP: CUSTOMIZING

In case the new field of BIT can easily be generated by SAP Convergent Charging with a constant value or with a base property from the rating and charging context, you can also customize and reconfigure the SAP CC system. Consult your implementation project team for [Setting up the Default Field Mapping Between CIT and BIT \(Implementation Project\)](#) on page [139]. A restart

of the SAP CC Core Server can be needed.

Settings for the Communications Taxing Server

The SAP CC CT Server is an optional software component of SAP Convergent Charging 3.0 used by SAP Convergent Invoicing. It has no connection with the Core Server of SAP CC and can be installed separately.



Setting up a Destination

Use

The SAP CC CT Server, as a JCo server program, implements functions that are called up by an ABAP Backend. It is registered via the SAP Gateway and waits for inbound RFC calls.

The CT Server registers itself under a program ID to an SAP gateway (not for a specific SAP system). If an RFC call is passed on from any SAP system to this SAP gateway with the option "Connection with a registered program" (with the same program ID), the connection takes place with the CT Server program.

Once an RFC function has been executed, the CT Server waits for further RFC calls from the same or other SAP systems.

If an RFC connection is interrupted or terminated, the CT Server automatically registers itself again on the same SAP Gateway under the same program ID.

See the [Creating an RFC Destination for SAP ERP](#) section.

Prerequisites

- Using transaction SM59, you have defined a RFC destination with connection type T (TCP/IP connection) in the SAP system.
- You have chosen the registration mode ("Registered server program" option under the "Technical settings" tab page) for this destination.
- The destination contains the required information about the SAP Gateway (host, service) and the registered CT Server (Program ID).

Procedure

- Stop the CT Server
- Edit the ct.config file located in /usr/sap/<SID>/CAC<id>/config/ folder (on Unix) or <drive>:\usr\<SID>\CAC<id>\config\ (on MS Windows). The file includes all the necessary instructions for setting up the destination in the CT Server:
 - Name of the registered destination: jco.server.repository_destination
 - Program ID: jco.server.progid
 - Gateway host: jco.server.gwhost
 - Gateway service: jco.server.gwserv
- Restart the server

Enabling & Setting up the SLD Data Supplier Function

Use

The SAP CC CT Server can send information data to the SLD when starting. By default, this function is not enabled at installation time. You have to configure manually the CT Server to connect to the SLD and to send data.

Prerequisites

- A SLD server is up and running.
- The Component Repository Content (CR Content) in the System Landscape Directory (SLD) is up-to-date (see SAP Note [669669](#)).

Procedure

- Stop the CT Server
- Edit the ct.config file located in /usr/sap/<SID>/CAC<id>/config/ folder (on Unix) or <drive>:\usr\<SID>\CAC<id>\config\ (on MS Windows)
- Enable the function by setting up a valid URL for the SLD server
- Change the communication parameters to the appropriate values:

Communication Parameters	
sld.url	The full and valid URL of the SLD server
sld.user	The username for the log on to the SLD server for authentication
sld.password	The password for the username needed for authentication

- Restart all the CT Server to apply the changes
- Check that the payload data are properly sent to the SLD server

Setting up the Log Directory for the EZTax Log Files

Use

The SAP CC CT Server generates EZTax log files in a directory. This directory also includes status files from BillSoft EZTax software.

For details about the content of this directory, see the *Operations Guide* on SAP Service Marketplace at the following location: ► <https://service.sap.com/instguidescs> → SAP CC 3.0 → Operate ◀.

Procedure

- Stop the CT Server
- Edit the ct.config file located in the config folder
- Change the value of the EZTAX_LOG_DIRECTORY parameter
- Restart the server



CAUTION

Do not use the log directory for appending the EZTax log files in a unique tax journal. It is highly recommended to stop the CT Server and move the EZTax log files to another directory of the host for working with and archiving.

Setting up Other Basic Settings

Prerequisite

BillSoft EZTax software is installed.

Procedure

- Stop the SAP CC CT Server
- Edit the ct.config file located in the <home>/config/ folder. The file includes all the necessary instructions for setting up:
 - The log file management of CT Server
 - The BillSoft EZTax parameters (server path, log file management)
- Restart the server

Advanced Configurations

Setting up a Landscape Without SAP ERP

Use

SAPinst does not manage the initial installation of a landscape with SAP CRM but without SAP ERP. If you want to install such a landscape, you have to perform the standard installation of SAP CC and set up manually the system and data:

- System integration: SAP CC must be integrated with another billing system, potentially connected to SAP CRM
- System customizations: N/A (the 2 systems are already integrated together)

- Data customizations: N/A (SAP Currencies are not available in SAP CC)
- System configurations:
 - Set up the jco communication (secured or not) and the notification function as detailed in this chapter
 -
- Master Data configurations:

Prerequisites

- SAP ERP/FI-CA is not part of the landscape of SAP CC
- SAP CRM is configured to receive the business and alert notifications from SAP CC

Procedure

- Consult the template file
(/usr/sap/<SYSTEM_ID>/CCD_<INSTANCE_ID>/exe/CC_CORE_SERVER/config/ci/jco.destination.sk) to create a temporary file containing the JCo destination parameters for SAP CRM (referenced below as <crm_destination_file>).
- Apply the recommendations from the beginning of this chapter
- Import the JCo destination for SAP CRM:

setup jcodestination import -login=<LGN> -password=<PWD> crm <crm_destination_file>
- Reset the notification policy configuration for SAP CRM
- Restart the instances of the SAP CC Core Server
- Check the logs of the server
- Check that the SAP CRM system

Result

The SAP CC Core Server system is up and running and can communicate with the SAP CRM system. The notification publication function is enabled.

The different communication channels are available.

9 System Configuration of the User Interfaces

SAP Convergent Charging includes several user interfaces. As system administrator or power users, you can configure these interfaces.

Settings for the Graphical User Interfaces

All the graphical user interfaces of SAP Convergent Charging 3.0 have a default configuration. They create a configuration file at first launch time if you did not create a file before.

You can configure the following interfaces:

- Core Tool
- BART Tool
- Simulation Tool
- Connector Administration Tool (CAT)

The configuration files are located in the <HOME>/config/ folder of each program.



NOTE

The configuration settings of the user interfaces are not related or restricted to an SAP user. They are applied for all the SAP users.

Setting up the Online Help Systems

Use

All the graphical user interfaces of SAP CC 3.0 can benefit from online help systems based on HTML technology. For legal reasons, they are not configured by default and you have to set up the necessary links and potentially install the documentation DVD locally or on an internal web site according to your policy. You can also set up these links to access directly to the SAP Help Portal.

Prerequisites

- A graphical user interface of SAP CC is installed and you have a logon
- When relevant, the documentation DVD for SAP CC 3.0 is installed on a shared network folder or locally on the machine that hosts a graphical user interface

Activities

You have to set up the following parameters:

Parameter	Description	Core Tool	BART Tool	Simulation Tool	CAT
help.contents.url	The URL to a HTML page that will be displayed from the Help menu of the user interface	X		X	X
help.components.url	Special: The URL to a HTML page that will be displayed from the Help menu of the user interface	X		X	

help.portal.url	<i>The URL to a help or documentation portal (inside or outside your company) that will be displayed from the Help menu of the user interface</i>	X		X	X
BART.help.contents.url	<i>See help.contents.url</i>		X		
BART.help.portal.url	<i>See help.portal.url</i>		X		

**NOTE**

The configuration settings of the user interfaces are not related or restricted to an SAP user. They are applied for all the SAP users.

Results

Once logged on, the SAP users can access online to the documentation from the *Help* menu of the graphical user interfaces.

Setting up the Core Tool**Use**

The SAP CC Core Tool is a graphical component of SAP CC 3.0. The Core Tool can start running without any configuration file. It will store some parameters of a user working session. You can set up these parameters and some other parameters and preferences listed in this section.

Procedure

- Stop the graphical user interface
- Edit the core_tool.config file or create such a file by copying the core_tool.config.sk template file
- Set the following parameters in the different sections
- Restart

Parameter	
Parameter(s)	language
Description	This parameter specifies which language is used for the graphical user interface.
Type	string
Default Value	EN
Range of Values	A code from ISO-639 Consult the template of configuration file

Parameter	
Parameter(s)	country
Description	This parameter specifies which country specific language is used for the graphical user interface.

Type	string
Default Value	US
Range of Values	A code from ISO-3166 Consult the template of configuration file

Parameter	
Parameter(s)	frame.width frame.height
Description	These parameters specify the width and height of the window of the program.
Type	integer
Default Value	Width: 900 Height: 700
Range of Values	1 to 65,535

Parameter	
Parameter(s)	help.contents.url help.components.url help.portal.url
Description	These parameters specify which main topics are displayed when navigating in the <i>Help</i> menu of the Core Tool. They can be configured to use the local online Help files or files located on the web portal (from SAP Help Portal or from a customer site). Note: The <i>Docu DVD</i> is required for this configuration.
Type	string
Default Value	By default, the URLs are targeted to the SAP Help Portal. See example below for details
Range of Values	A valid HTTP URL or FILE URL for each entry in the menu of the graphical user interface where the documents must be accessible

**EXAMPLE (WEB SITE)**

You can set up the following parameters:

```
help.contents.url=http://help.sap.com/saphelp_cc30/helpdata/en/e3/core_
tool/frameset.htm
help.components.url=http://help.sap.com/saphelp_cc30/helpdata/en/e3/com
poref/frameset.htm
help.portal.url=http://help.sap.com/
```

In case of an upgraded Core Tool, we recommend to change these parameters to use the online hHelp system dedicated to your version to view both data models that can be configured:

```
help.contents.url=http://help.sap.com/saphelp_cc30/helpdata/en/e3/core_
tool_hybrid/frameset_hybrid.htm
help.components.url=http://help.sap.com/saphelp_cc30/helpdata/en/e3/com
poref_hybrid/frameset_hybrid.htm
help.portal.url=http://help.sap.com/
```

**EXAMPLE (LOCAL MACHINE)**

You can set up the following parameters:

```
help.contents.url=file:/C:/myrootfoldername/StandardHTML/EN/e3/core_too
l/frameset.htm
help.components.url=file:/C:/myrootfoldername/StandardHTML/EN/e3/compor
ef/frameset.htm
help.portal.url=http://help.sap.com/
```

Where C is the local drive letter and where **myrootfoldername** is the main folder that includes a copy of the documentation from the DVD.

**EXAMPLE (SHARED NETWORK FOLDER)**

You can set up the following parameters:

```
help.contents.url=file://mysharednetworkfoldername/StandardHTML/EN/e3/c
ore_tool/frameset.htm
help.components.url=file://mysharednetworkfoldername/StandardHTML/EN/e3
/comporef/frameset.htm
help.portal.url=http://help.sap.com/
```

Where **mysharednetworkfoldername** is the main folder (or path) that includes a copy of the documentation from the DVD.

Parameter	
Parameter(s)	xml.verbose
Description	For troubleshooting or for testing purposes, this parameter allows you to trace the XML communications exchanged between the Core Tool and the SAP CC Core Server.

Type	boolean
Default Value	false
Range of Values	false or true


Setting up the BART Tool

Use


The SAP CC BART Tool is an optional component of SAP Convergent Charging needed for configuring SAP CC BART Server.




Procedure

- Stop the graphical user interface
- Edit the bartTool.config file or create such a file by copying the bartTool.config.sk file. Those files are xml files.
- Set the following parameters in the different sections
- Restart

Parameter	
Parameter(s)	language
Description	This parameter specifies which language is used for the graphical user interface.
Type	string
Default Value	EN
Range of Values	A code from ISO-639 Consult the template of configuration file
	 EXAMPLE You can set up the following parameters <pre><language> en</language></pre>

Parameter	
Parameter(s)	country
Description	This parameter specifies which country specific language is used for the graphical user interface.
Type	string
Default Value	US
Range of Values	A code from ISO-3166

	Consult the template of configuration file
	 EXAMPLE You can set up the following parameters <pre><country> US</country></pre>

Parameter	
Parameter(s)	BART.help.contents.url BART.help.portal.url
Description	These parameters specify which main topics are displayed when navigating in the <i>Help</i> menu of the BART Tool. They can be configured to use local online Help files or files located on a web portal (from SAP Help Portal or from a customer site). Note: The <i>Docu DVD</i> is required for this configuration.
Type	string
Default Value	By default, the URLs are targeted to the SAP Help Portal. See example bellow for details
Range of Values	A valid HTTP URL or FILE URL for each entry in the menu of the graphical user interface where the documents must be accessible
	 EXAMPLE (WEB SITE) You can set up the following parameters: <pre><BartHelpContentsURL> http://help.sap.com/saphelp_cc30/helpdata/en/e3/bart_tool/frameset.htm </BartHelpContentsURL> <BartHelpPortalURL>http://help.sap.com</BartHelpPortalURL></pre>  EXAMPLE (LOCAL MACHINE) You can set up the following parameters: <pre><BartHelpContentsURL>file:/C:/myrootfoldername/StandardHTML/EN/e3/bart_ tool/frameset.htm</BartHelpContentsURL></pre> Where C is the local drive letter and the myrootfoldername is the main folder that includes a copy of the documentation from the DVD.  EXAMPLE (SHARED NETWORK FOLDER)

	<p>You can set up the following parameters:</p> <pre><BartHelpContentsURL>file://mysharednetworkfoldername/StandardHTML/EN/e3/bart_tool/frameset.htm</BartHelpContentsURL></pre> <p>Where mysharednetworkfoldername is the main folder (or path) that includes a copy of the documentation from the DVD.</p>
--	---

Setting up the Simulation Tool

Use

The SAP CC Simulation Tool is an optional component of SAP CC. You can configure the final precision and rounding mode of the results of the rating calculation during the simulation.

Procedure

- Stop the graphical user interface
- Edit the sim_tool.config file or create such a file by copying the sim_tool.config.sk file
- Set the following parameters in the different sections
- Restart

Parameter	
Parameter(s)	language
Description	This parameter specifies which language is used for the graphical user interface. When not set, the program uses the language of the Operating System or English.
Type	string
Default Value	EN
Range of Values	Consult the template of configuration file

Parameter	
Parameter(s)	country
Description	This parameter specifies which language is used for the graphical user interface. When not set, the program uses the language of the Operating System or English.
Type	string
Default Value	US
Range of Values	Consult the template of configuration file

Parameter	
Parameter(s)	pns.transaction_precision
Description	This parameter specifies the number of decimal positions to keep for rated

	transaction amounts.
Type	string
Default Value	6
Range of Values	-1 to 6 -1: The precision of the currency is used.

Parameter	
Parameter(s)	pns.transaction_rounding_mode
Description	<p>This parameter specifies the method used to round the amounts of rated transactions.</p> <p>The possible values are:</p> <ul style="list-style-type: none"> ■ TRUNCATE: Rounding mode to round towards zero. Never increments the digit prior to a discarded fraction (i.e., truncates). Note that this rounding mode never increases the magnitude of the calculated value. (e.g. 0.9 give 0.0) ■ RAISE: Rounding mode to round away from zero. Always increments the digit prior to a nonzero discarded fraction. Note that this rounding mode never decreases the magnitude of the calculated value. (e.g. 0.1 give 1.0) ■ NEAREST: Rounding mode to round towards "nearest neighbor" unless both neighbors are equidistant, in which case round up (RAISE). (e.g. 0.5 give 1.0, 0.4 give 0.0)
Type	
Default Value	TRUNCATE
Range of Values	RAISE, TRUNCATE, NEAREST

Parameter	
Parameter(s)	help.contents.url help.components.url help.portal.url
Description	<p>These parameters specify which main topics are displayed when navigating in the <i>Help</i> menu of the Simulation Tool. They can be configured to use the local online Help files or files located on the web portal (from SAP Help Portal or from a customer site).</p> <p>Note: The <i>Docu DVD</i> is required for this configuration.</p>
Type	string
Default Value	By default, the URLs are targeted to the SAP Help Portal. See example bellow for details
Range of Values	A valid HTTP URL or FILE URL for each entry in the menu of the graphical user interface where the documents must be accessible

	<div> </div> <p>EXAMPLE</p> <pre> help.contents.url=http://help.sap.com/saphelp_cc30/helpdata/en/e3/simu_ tool/frameset.htm help.components.url=http://help.sap.com/saphelp_cc30/helpdata/en/e3/com poref/frameset.htm help.portal.url=http://help.sap.com/ </pre> <p>See also the examples from the Core Tool configuration.</p>
--	---

Setting up the Connector Administration Tool

Use

The SAP CC CAT is an optional component of SAP Convergent Charging needed for configuring the IEC.


Procedure

- Stop the graphical user interface
- Edit the cat.config file or create such a file by copying the cat.config.sk template file
- Set the following parameters in the different sections
- Restart

Parameter	
Parameter(s)	default_language
Description	This parameter specifies which language will be used for the graphical user interface. When not set, the program uses the language of the Operating System or English
Type	String
Default Value	Not set
Range of Values	Consult the template of configuration file

Parameter	
Parameter(s)	language
Description	This parameter specifies which language is used for the graphical user interface.
Type	string
Default Value	EN
Range of Values	A code from ISO-639 Consult the template of configuration file

Parameter	
Parameter(s)	country
Description	This parameter specifies which country specific language is used for the graphical user interface.
Type	string
Default Value	US
Range of Values	A code from ISO-3166 Consult the template of configuration file

Parameter	
Parameter(s)	help.contents.url help.portal.url
Description	These parameters specify which main topics are displayed when navigating in the <i>Help</i> menu of the CAT. They can be configured to use the local online Help files or files located on a web portal (from SAP Help Portal or from a customer site). Note: The <i>Docu DVD</i> is required for this configuration.
Type	String
Default Value	By default, the URLs are targeted to the SAP Help Portal See example below for details
Range of Values	A valid HTTP URL or FILE URL for each entry in the menu of the graphical user interface where the documents must be accessible
	 EXAMPLE help.contents.url=http://help.sap.com/saphelp_cc30/helpdata/en/e3/cat/frameset.htm help.portal.url=http://help.sap.com/ See also the examples from the Core Tool configuration.

Settings for the Command Line Interfaces

There is no configuration parameter for the Admin+ and the BART+ command line interfaces of SAP Convergent Charging 3.0.

You can consult the [Before You Start](#) chapter about these user interfaces (see page [\[39\]](#)).

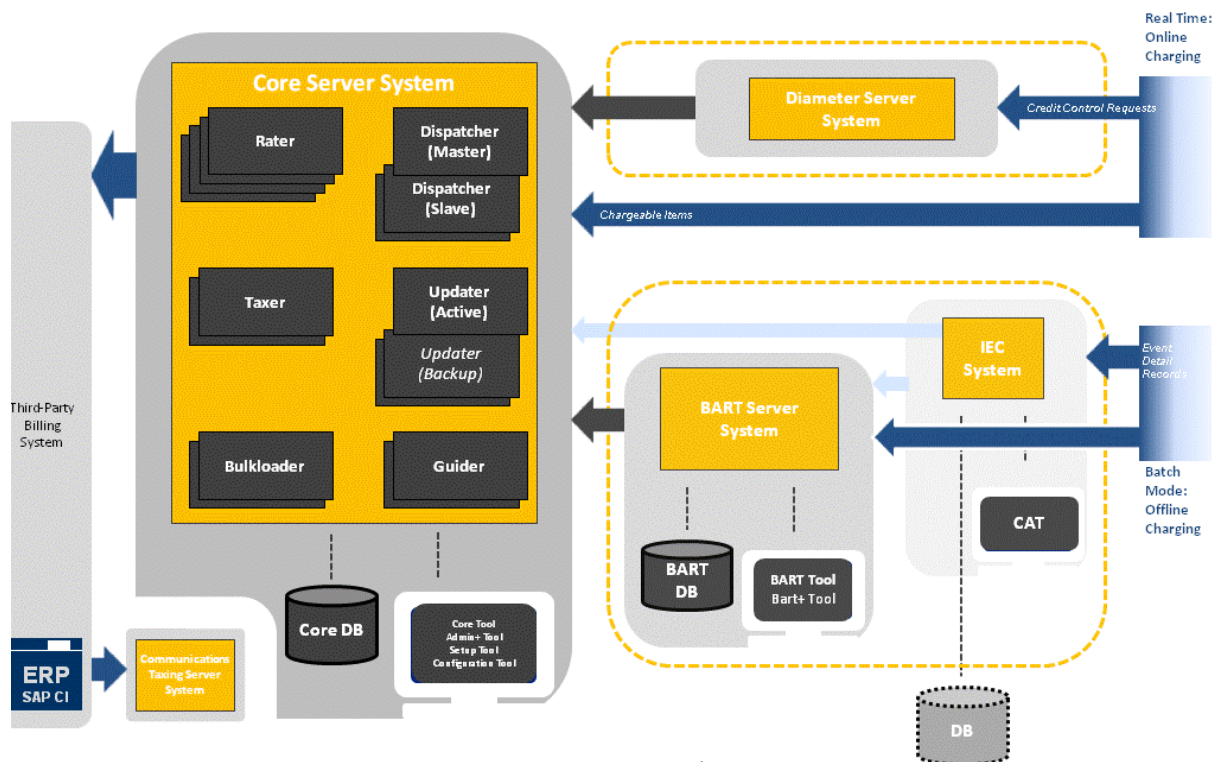
10 Configuration of the BART Server

The SAP CC BART Server is an optional software component of SAP Convergent Charging in an offline charging scenario. It is used in a batch-mode for handling the acquisitions of CDRs and launching rating and charging in batch mode.

Scenario Variants

Several variants of integrations are possible:

- Offline acquisition from connected system
 - The SAP CC BART Server communicates with the SAP CC Core Server and an external mediation system
- Offline acquisition from repository (file, database)
 - The SAP CC BART Server communicates with the SAP CC Core Server and an Import/Export connector (IEC) application for SAP CC, present in the landscape and able to retrieve data from the client repository



SAP CC 3.0 System Landscape Overview

Configuration Tools and Files

The SAP CC BART Server System is configured by using the user interfaces:

- BART Tool and
- [BART+ Tool](#)

Configuration File (bart.config)

All the system configuration parameters are stored in a file (bart.config).

Its file format uses the ISO 8859-1 character encoding. Characters that cannot be directly represented in this encoding scheme must be written using unicode escapes. Consult details at: http://java.sun.com/docs/books/jls/third_edition/html/lexical.html#3.3.

A template file is provided and must not be changed.

Use

Prefer using the configuration tool ([BART+ Tool](#)) to set up the system parameters.

It can update the configuration file in backend.

Technical Information

The bart.config file and the associated template (bart.config.sk) contain detailed information about the configuration of every system parameter, which you can refer to get more information before changing a configuration value.

Location

The bart.config file is located in one of the following folders:

- /usr/sap/<System_ID>/<Instance_ID>/config/ (UNIX)
- <drive>:\usr\sap\<System_ID>\<Instance_ID>\config\ (MS Windows)

Communication Settings

Setting up the Connection to the Database

Use

You can configure the database connection used by SAP CC BART Server.

Procedure

- Edit the [bart.config](#) file
- Make sure you correctly type the following attributes: login, password, database URI
- Save the file
- Restart the server

Setting up the Database Connection SQL Failure Management

Use

When the BART Database crashes during a rating session, this parameter defines the directory of the file used for storing information on non-committed CDR modifications. This file is usually created before an unexpected stop of the BART Server processes. When the BART Server restarts, the SQL failure file is read and its content is committed to the database.

Procedure

- Edit the [bart.config](#) file
- Set the `sql.failures.log.file.name` parameter
- Save the file
- Restart the server

Setting up the Connection to the SAP CC Core Server

Use

You can configure the IP addresses and the port number of the SAP CC Core Server System.

For more information, consult the template of configuration file (`bart.config.sk`).

Default Settings

- HTTP Secured (HTTPS) connections are set up between the SAP CC Core Server System and the SAP CC BART Server System
- The appropriate IP addresses and listening port numbers are set up for all the Dispatcher instances of the Core Server System



NOTE

These settings may have been changed at the installation time. See the *Installation Guide* for details.

Prerequisites

- An SAP CC user dedicated to the SAP CC BART Server System is required with specific rights according to your security policy
- You have determined the current communication settings of the SAP CC Core Server System for the HTTP connections. If HTTP Secured (HTTPS) connections are configured, you may need to install certificates on the BART Server System if the certificates used by the SAP CC Core Server System are self-signed or signed by an unrecognized certification authority.

Procedure

To set up the SAP CC BART Server System to send request messages to the SAP CC Core Server System:

- Access to the machine that hosts the BART Server System
- Edit the [bart.config](#) file
- Set up the `cc.dispatcher.boot.http.url.list_port` parameter
 - Use HTTPS URLs in case of secured communications
- Set up the information for the SAP CC User dedicated to the BART Server System to communicate with the Core Server System: `cc.login` and `cc.password` parameters
- Save the configuration file
- Create a keystore file containing the certificates used by the SAP CC Core Server System:
 - For each certificate of the Core Server System, run the command program from JVM:

```
keytool -import <alias> -file <Core_Server_certificate_file> -keystore
<keystore_file> -storepass <keystore_password> -noprompt
```

- Where `<alias>` must be unique (ex.: use the appropriate host names of the Core Server)
- The certificates will be added to the keystore file

- From the host machine of the BART Server, edit the `jstart.config` file located in `/usr/sap/<SID>/SYS/profile/jstart/<Start_profile_of_the_instance>/` folder
 - Locate the line starting with `BART.javaParameters` and add the following instruction:

```
-Djavax.net.ssl.trustStore=<keystore_file> -  
Djavax.net.ssl.trustStorePassword=<keystore_password>
```

- Save the `jstart.config` file
- The password used for this keystore file will not be ciphered

**NOTE**

The keytool program is provided with the SAP JVM at the following location:
`/usr/sap/<System_ID>/<Instance_ID>/exe/sapjvm_6/bin/`.

- Restart the BART Server system

**NOTE**

For managing your SAP CC Users, consult the *Security Guide* on SAP Service Marketplace at:
<https://service.sap.com/instguidesc> → SAP CC 3.0 → Plan ↵.

Setting up the HTTP/HTTPS Connections of the BART Server

Use

The SAP CC BART Server System provides a technical interface HTTP Communication Interface (HCI) to receive request messages.

You can set up some system parameters to define the listening port of the BART Server System, the number of dedicated threads that are available for handling simultaneous HCI calls and the security level.

These communication settings should be used by the applications or systems that connect to the BART Server System:

- SAP CC BART Tool
- Mediation application

You can maintain the settings for these communications for a development landscape.

Default Settings

HTTP Secured (HTTPS) connections are set up.

**NOTE**

These settings may have been changed at the installation time. See the *Installation Guide* for details.

Procedure

- Edit the [bart.config](#) file
- Set up the `bart.http.server.port` and `bart.http.server.threads` parameters
- Set up the `bart.http.secure` parameter to true or false
- Save the configuration file
- Restart the server

Enabling the Secured HTTP Connections

Use

You can change or enable the secured HTTP connections. You need to generate a private key and its associated public certificate.

The public certificates must be shared with the connected applications or systems.

Consult the *Installation Guide* to generate a private key and its associated certificate for the HTTPS connections.

Activities

- Generate a private key and its associated public certificate
- Install the key/certificate in the SAP CC BART Server System
- Enable the HTTPS connections
- Share the public certificate with the connected applications or systems

Installing the Private Key and Certificate

Use

To be able to use HTTP Secured (HTTPS) connections, the private key and its associated public certificate must be loaded by the SAP CC BART Server System. The key and certificate are physically stored in an encrypted file located in the configuration folder. The Java Key Store (JKS) technology is used.

Prerequisites

- A private key file and a public certificate have been generated for the SAP CC BART Server System
- The key/certificate are imported into a keystore file in Java Key Store (JKS) format
- You know the password used to create the keystore file
- You know the password used to create the private key

Procedure


- Create a keystore file containing the private key and its associated certificate:
 - Use the same third party software used to generate the key/certificate
 - The keystore file must be created in JKS format
- Store the keystore file in `/usr/sap/<System_ID>/<Instance_ID>/config/` folder of the BART Server System
- Edit the [bart.config](#) file
 - Set up the `bart.http.secure` parameter to true
 - Set up the `bart.http.secure.keystore.file` parameter with the name and location of the keystore file containing the private key and the associated certificate

- Set up the `bart.http.secure.keystore.password` parameter with the password of the keystore file
- Set up the `bart.http.secure.key.password` parameter with the password of the private key
- Save the configuration file
- Restart the server to encrypt these passwords and to take the changes into account

Result

The SAP CC BART Server System can receive messages from the HTTP Communication Interface.

**NOTE**

Consult the *Installation Guide* about the generation of certificates for the HTTP connections and communications SAP Service Marketplace at: <https://service.sap.com/instguidescs> → SAP CC 3.0 → *Install* .

Setting up the TCP/IP Connection for the Acquisition or Rerating Functions

Use

You can configure:

- For the acquisition function: the connection to the BART Server
- For the rerating function: the listening port and the number of dedicated threads that are available to handle simultaneous API calls to the services using the TCP/IP protocol

Procedure

- Edit the `bart.config` file
- Set the `bart.collector.server.hostname` parameter
- Set the `bart.collector.server.port` parameter
- Set the `bart.collector.server.threads` parameter
- Set the `rerating.pool_size` parameter
- Set the `rerating.queue_size` parameter
- Save the file
- Restart the server

Enabling& Setting up the SLD Data Supplier Function

Use

The SAP CC BART Server can send information data to the SLD when starting. By default, this function is not enabled at installation time. You have to configure manually the BART Server to connect to the SLD and to send data.

Prerequisites

- A SLD server is up and running.
- The Component Repository Content (CR Content) in the System Landscape Directory (SLD) is up-to-date (see SAP Note [669669](#)).

Procedure

- Stop the BART Server
- Edit the [bart.config](#) file

- Enable the function by setting up a valid URL for the SLD server
- Change the communication parameters to the appropriate values:

Communication Parameters	
bart.sld.url	The full and valid URL of the SLD server Ex.: http:// <SLD_HOST>:<SLD_HOST_PORT>/sld/ds
bart.sld.user	The username for the log on to the SLD server for authentication
bart.sld.password	The password for the username needed for authentication

- Restart all the BART Server to apply the changes
- Check that the payload data are properly sent to the SLD server

Basic Settings

Setting up the Magic Number Pattern (De-Duplication Function)

Use

You can configure the deduplicate function to set CDRs which must be identified as duplicates.



NOTE

A magic number pattern must be defined for each CDR type (e.g. MMS, SMS, ...) that is acquired by the SAP CC BART Server.

Procedure

- Edit the [bart.config](#) file
- Change the values of parameters in the magic number section
- Save the file
- Restart the server

Parameter	
Parameter(s)	magic_number.number
Description	Number of magic number patterns.
Type	Integer
Default Value	1
Range of Values	Non zero integer

For each magic number:

Parameter	
Parameter(s)	magic_number.<n>.item_name
Description	CDR name on which the magic number should be associated

Type	String
Default Value	cdr
Range of Values	A unique CDR name

Parameter	
Parameter(s)	magic_number.<n>.fields
Description	List of fields to concatenate to build the magic number It can contain standard item values (name, consumption_date, user_id ...) or additional item fields prefixed by 'item' (for example item.call_duration).
Type	String
Default Value	name;consumption_date;user_id;service_id
Range of Values	

Setting up the Keeping Days

By default 40 days of Consumption Detail Records (CDRs) are stored and kept in the BART Database. For business, legal or technical reason you may need to change this function. You can extend this period up to 70 days.



CAUTION

If your business scenario includes rerating services, ensure that the configuration of the SAP CC Core Server System is consistent. The total keeping days must be equal to the retention period for rerating.

Check that the COUNTER_SNAPSHOT_COUNT system parameter is set to the same value than the keeping days.

Activities

- You determine the keeping days according to your business requirements
- You change the partitioning configuration of the BART Database to apply these settings

Setting up the Scheduled Job Management

Use

You can fine configure:

- The maximum number of scheduled jobs that can be active at the same time
- The period between the output of two status events

Procedure

- Edit the bart.config file

- Set up these parameters
- Save the file
- Restart the server

Monitoring and Event Broadcasting

Jobs, acquisition and rating session events can be broadcasted through the use of XML messages that are generated at a regular frequency on the UDP network layer. By default, the SAP CC BART Server of SAP Convergent Charging 3.0 is provided with an event broadcaster and with a file report handler.

The BART Server handles the following events grouped by functions (topics).

Topic (Function)	Event	Description
Acquisition	Acquisition session start event	This event is triggered each time a new acquisition session is started through the mediation chain. This event mainly contains the definition of the session being created.
Acquisition	Acquisition session status event	This event is triggered at a regular frequency (depending on the BART Server configuration parameters) and describes the elapsed time of the session, the number of newly acquired CDRs and the number of duplicated CDRs.
Acquisition	Acquisition session stop event	This event is triggered each time an acquisition session is complete. It contains the total duration of the session, the number of acquired CDRs and the number of duplicated CDRs.
Rating	Rating session start event	This event is triggered each time a new rating session is started. This event mainly contains the definition of the session being created.
Rating	Rating session status event	This event is triggered at a regular frequency (depending on the BART Server configuration parameters) and describes the elapsed time of the session, the number of rated CDRs and the number of erroneous CDRs.
Rating	Rating session stop event	This event is triggered each time a rating session is complete. It contains the total duration of the session, the number of rated CDRs and the number of erroneous CDRs.
Job	Job start event	This event is triggered each time a job execution is started. This event mainly contains the definition of the job being started.
Job	Job status event	This event is triggered at a regular frequency (depending on the BART Server configuration parameters) and describes the elapsed time of the job execution.
Job	Job stop event	This event is triggered each time a job execution is complete. It contains the total duration of the job execution.

Setting up the File Report Handler

Use

The file report handler of BART Server is sensitive to stop events from acquisition and rating sessions. For each event received, the BART Server produces a report file containing the details of the complete session.

Procedure

- Edit the report.config file. It is located in the folder /usr/sap/<SID>/CAB<id>/config/ (Unix) of <drive>:\usr\sap\<SID>\CAB<id>\config\ (Windows).
- Change the values of following parameters:
 - folder:** folder where to store the report file (default: <BART_HOME>/logs)
 - filename:** prefix for reporting file (default: report)
 - fileSuffix:** suffix for reporting file (default: .txt)
- Save the file



EXAMPLE

See the following example of a report file for an acquisition session: report_acquisition_05-11-15.txt

```
#####
      ACQUISITION REPORT
#####
CREATION DATE = Tue Nov 15 21:34:10 CET 2005
ACQUISITION DATE = 2005-11-15 21:34:10.717
ACQUISITION DURATION = 24 sec
ACQUISITION SOURCE = somewhere_with_some_CDRs\source.txt
ACQUISITION DESCRIPTION = Test JUNIT
ACQUISITION MODE= Acquisition and de-duplicate mode
NB CDR ACQUIRED = 961
NB CDR DUPLICATE= 39
NB CDR CONSOLIDATE = 950
STATUS= ended
```



EXAMPLE

An example of reporting file for a rating session follows: report_rating_05-11-15.txt

```
#####
      RATING REPORT
#####
CREATION DATE = Tue Nov 29 17:53:32 CET 2005
RATING START DATE = 2005-11-29 17:53:32.303
RATING DURATION = 2 sec
RATING MAX CONSUMPTION DATE = 2005-11-29 17:53:32.287
RATING DESCRIPTION = null
RATING MODE= most mode
NB CDR RATED = 100
NB CDR IN ERROR= 0
STATUS= cleaned
```

Enabling the Monitoring Function

Use

These parameters define the monitoring state: Activated or not.

Procedure

- Edit the [bart.config](#) file
- Set the monitoring state parameter
- Set the communication settings for the monitoring function
- Set the technical settings for the monitoring function
- Save the file
- Restart the server

Advanced: Resetting the Customized File Report Handler

Procedure

- Do change the configuration only for customized event handlers
- View the [bart.config](#) file
- Verify that the default parameter values are present:
report.handler.number = 1
report.handler.1 = com.highdeal.bart.event.handler.FileReportHandler

Technical Settings

Setting up the Logging and Tracing Function

Use

The attributes described below can be configured according to the expected level of logs, number of backups and maximum size of each backup log file.



NOTE

Refer to the SAP Convergent Charging configuration guidelines for more details regarding the log output parameters.

Procedure (Immediate Changes)

- Launch the [BART+ Tool](#) and log on
- Check the current settings
- Set up the new level for logs with the command and apply immediately and permanently this change:
 - `set log_level <NEW_LOG_LEVEL> all`
 - Set up the other relevant parameters: `log.file.name`, `log.file.size`, `log.file.backups`, `log.errorfile.name`
- Log off

Procedure (Offline Changes)

- Edit the [bart.config](#) file
- Change the values of parameters in the log section (`log.level`, `log.file.name`, `log.file.size`, `log.file.backups`, `log.errorfile.name`)
- Save the file

- Restart the server

Changing the Password to Log on to the Core Server

Use

The BART Server uses a user/password to log on the Core Server. You may have to change this password for security or test reasons.

Procedure

- Launch the [Core Tool](#) and log on with a user that has the User Administration role
- Change the password of the user reserved for the BART Server
- Consult the `bart.config.sk` file for detailed information
- Check with the BART Tool that there is no running session
- Stop the BART Server
- Edit the [bart.config](#) file in the configuration folder of the BART Server
- Update the `cc.login` and `cc.password` parameters with the values previously set in the Core Tool
- Save the file
- Restart the BART Server. It will cipher the password and save the configuration file.



CAUTION

You must restart immediately the BART Server to secure this procedure.

Technical Configuration for the Monitoring

Use

For each function (topic), you can configure the period between the generations of two status events:

- `acquisition.session.monitoring.period`
- `rating.session.monitoring.period`
- `scheduler.job.monitoring.period`

Technical Configuration for Acquisition Sessions

Use

You can fine configure:

- The maximum number of concurrent running acquisition sessions
- The period between the output of two status events

Detailed information on the generation of events is provided in the *Technical Reference Guide* on SAP Service Marketplace.

Procedure

- Edit the `bart.config` file
- Set the `acquisition.session.max.number` and the `acquisition.session.monitoring.period` parameters

- Save the file
- Restart the server

Technical Configuration for CDR Consolidation Cache Management

Use

You can fine configure the consolidation cache management:

- The `consolidation.cache.enable` parameter allows you to enable or disable the consolidation cache
- The `consolidation.cache.size` parameter allows you to set the size of the cache by giving the number of accesses handled by the cache

Procedure

- Consult the `bart.config.sk` file for detailed information
- Edit the `bart.config` file
- Set up these parameters
- Save the file
- Restart the server

Technical Configuration for Rating Sessions Management

Use

You can fine configure the rating session management:

- The maximum number of concurrent rating sessions
- The period between the outputs of two status events
- The number of concurrent threads per rating session: It must be chosen according to the number of collecting threads available on the SAP CC Core Server side. Furthermore, it must be less than or equal to the number of collecting threads. However, keep in mind that several rating sessions can be launched at the same time
- The size of a CDR commit block: It corresponds to the maximum number of CDRs rated through the Core Server before the result is committed to the BART Database.

Procedure

- Edit the `bart.config` file
- Set these parameters
- Save the file
- Restart the server

Technical Configuration for Rerating

You can fine configure the following parameters:

- The number of threads (`rerating.pool.size=4`) used for rerating subscriptions. Keep in mind that a thread is used per subscription.



CAUTION

This parameter must not exceed the maximum number of concurrent rating sessions (`rating.session.max.number=10`) which is set in the configuration file. Furthermore, the number of rating and rerating sessions running at the same time must not also exceed the

| maximum number of concurrent rating sessions (*).

- The number of session orders stored in memory (rerating.queue.size=100) for rerating subscriptions.

(*) If necessary, you can change the value of the maximum number of concurrent rating sessions, but changing the value of this parameter may alter the performance of processes.

Implementation Tasks

This section lists the configurations determined by the solution consultants and by the technical consultants of your project team.

Scenario Variant	Technical Interface	SAP CC Software Units	Implementation
Offline acquisition from connected system	Java	BART Server	Implementing the CDR Acquisition with the Java API (TCP/IP)
Offline acquisition from repository (file, database)		BART Server, IEC	Implementing the CDR Acquisition with an IEC

Implementing the CDR Acquisition with the Java API (TCP/IP)

Use

The SAP CC BART Server receives CDRs from network elements or applications and sends them as chargeable items to the SAP CC Core Server. The acquisition is managed by the client application.

You can customize your application with the Java Library provided by SAP Convergent Charging in a Software Development Kit (SDK):

Function	Technical Interface	Software Units	Technical Operation or API
Acquisition of CDRs	Java	BART SDK	Java Package: com.highdeal.bart.message Java Class: CDRServiceClient

For more technical details, consult online the Javadoc in SAP Help Portal: ► <http://help.sap.com/cc> → SAP CC 3.0 → Development → BART Server Javadoc → com.highdeal.bart.message ◀.

Activities

As technology consultant, you have to:

- Specify and implement your CDR acquisition process according to the Java API (TCP/IP) Specification of SAP Convergent Charging and by using the [com.highdeal.bart.message.CDRServiceClient](#) Java class

**NOTES**

- For test and training purpose, you can prefer managing the CDR acquisition with an IEC application and dummy files containing CDRs
- You can also use the Java API (XML/HTTP) or the XML API for managing the CDR acquisition for test purpose

**EXAMPLE**

```
CDRServiceClient collector;
try {
    collector = new CDRServiceClient("BART_HOST",2009);
} catch (Exception e) {
    System.out.println("Cannot initialize BART Collector client -> "+e);
    e.printStackTrace();
}

// build up the acquisition session
AcquisitionSessionModel session = new AcquisitionSessionModel(...)
try {
    session = collector.startAcquisitionSession(session);
} catch (InvalidAcquisitionException e) {
    System.out.println("InvalidAcquisitionException -> "+e);
} catch (ServerUnavailableException e) {
    System.out.println("OperationFailureException -> "+e);
} catch (CommunicationFailureException e) {
    System.out.println("OperationFailureException -> "+e);
} catch (Throwable t) {
    System.out.println("Throwable -> "+t);
}
System.out.println("StartAcquisition() completed");

Vector cdrs = new Vector();
cdrs.add(new CDRModel(...// build up some CDRs
try {
    result = collector.acquireCDR(cdrs, session);
} catch (InvalidCDRException e) {
    System.out.println("InvalidCDRException -> "+e);
} catch (InvalidAcquisitionException e) {
    System.out.println("InvalidAcquisitionException -> "+e);
} catch (ServerUnavailableException e) {
    System.out.println("OperationFailureException -> "+e);
} catch (CommunicationFailureException e) {
    System.out.println("OperationFailureException -> "+e);
} catch (Throwable t) {
    System.out.println("Throwable -> "+t);
}

try {
    session = collector.stopAcquisitionSession(session);
} catch (InvalidAcquisitionException e) {
    System.out.println("InvalidAcquisitionException -> "+e);
} catch (ServerUnavailableException e) {
    System.out.println("OperationFailureException -> "+e);
} catch (CommunicationFailureException e) {
    System.out.println("OperationFailureException -> "+e);
} catch (Throwable t) {
    System.out.println("Throwable -> "+t);
}
System.out.println("StopAcquisition() completed");
```

Implementing the CDR Acquisition with an IEC

Use

The SAP CC BART Server receives CDRs from an Import/Export connector (IEC) application and sends them as chargeable items to the SAP CC Core Server. The acquisition is managed by the IEC application. You can also customize this application with some Java tasks that will be performed on the data.

Consult the online Help of the SAP CC Connector Administration Tool in SAP Help Portal: <http://help.sap.com/cc> → SAP CC 3.0 → CAT → About Scenario. You can access to the online Help from the graphical user interface.

Prerequisites

- The IEC software unit of SAP Convergent Charging is installed and configured on your landscape

Implementation Activities

As technology consultant, you have to:

- Model and set up a scenario file for the IEC to retrieve your CDRs from the appropriate repository (file or database). This scenario must include components for the acquisition by BART and for managing the acquisition sessions.
- You can configure several scenarios to process the data or to perform some pretreatments.
- You can customize your IEC application by developing some Java tasks that can be performed by the IEC application (see page [230]).

Advanced: CDR Acquisition with the Java API (XML/HTTP)

Use

For test or training purpose, the SAP CC BART Server can receive CDR acquisition from the HTTP Communication Interface (HCI) of SAP Convergent Charging.

Consult online the BART Server Javadoc from the SDK or in SAP Help Portal at: <http://help.sap.com/cc> → SAP CC 3.0 → Development → BART Server Javadoc → *com.highdeal.bart.hci*.

Activities

- Specify and implement your CDR acquisition process according to the API specifications of SAP Convergent Charging and by using the Java classes of the [com.highdeal.bart.hci](http://help.sap.com/cc) Java package



EXAMPLE

A sender has to be instantiated as described in the SAP Convergent Charging documentation:

```
HttpMessageSender sender = ....
    StartAcquisitionSessionOp op = new StartAcquisitionSessionOp();
    String description = "Tests for BART User Guide";
    String source = "BART Reference";
    AcquisitionSessionModel session = new AcquisitionSessionModel(source, description,
        AcquisitionSessionModel.ACQUIRE_AND_DEDUPLICATE_MODE );
    op.setAcquisitionSession(session);

    MessageOriginator originator = new MessageOriginator();
```



```

originator.setName("USER"); // set the user name who has rights to create session in BART
originator.setAuthentication(new SimpleMessageAuthentication("PASSWORD")); // set the user password
MessageHeader header = new MessageHeader();
header.setOriginator(originator);
MessageBody body = new MessageBody();
body.addOperation(op);
MessageEnvelope envelope = new MessageEnvelope();
envelope.setBody(body);
envelope.setHeader(header);


try {
    MessageEnvelope result = sender.send(envelope);
    StartAcquisitionSessionResult opRes =
(StartAcquisitionSessionResult)result.getBody().getResult(0);
    session = opRes.getAcquisitionSession();
} catch (CommunicationFailureException e) {
    System.out.println("CommunicationFailureException -> "+e);
} catch (InvalidAcquisitionException e) {
    System.out.println("InvalidAcquisitionException -> "+e);
} catch (OperationFailureException e) {
    System.out.println("OperationFailureException -> "+e);
}
System.out.println("StartAcquisition() completed");


```

Advanced: CDR Acquisition with the XML API

Use

For test or training purposes, SAP CC BART Server can receive CDR acquisitions from the HTTP Communication Interface (HCI) of SAP Convergent Charging.

Consult online the SAP CC BART Server Javadoc from the SDK or in SAP Help Portal at: 

<http://help.sap.com/cc> → SAP CC 3.0 → Development → BART Server Javadoc → *com.highdeal.bart.hci*  about the xsd fragments.

Activities

- Specify and implement your CDR acquisition process according to the API specifications of SAP Convergent Charging and by using the XSD fragments provided in the [com.highdeal.bart.hci](http://help.sap.com/cc) documentation



EXAMPLE OF HCI ENVELOPE SENT WITH THE HTTP CLIENT UTILITY PROGRAM

```

API request sent through the http client utility:
<HOME>/bin/http_client <BART_HOST> <BART_HOME>bart_run_rating_session.xml
<?xml version="1.0" encoding="utf-8"?>
<envelope>
  <header transaction="most">
</header>
  <body>
    <startAcquisitionSession>
      <acquisition startDate="2005-01-11T14:22:03" source="bart.xml"
description="test source XML" mode="acquireAndDeduplicate"/>
    </startAcquisitionSession>
  </body>
</envelope>

```



EXAMPLE OF ANSWER

```

<?xml version="1.0" encoding="utf-8"?>
<envelope>
  <header transaction="most">
</header>
  <body>
    <startAcquisitionSessionResult>
      <acquisition sessionID= "12002" startDate="2005-01-11T14:22:03"
source="bart.xml" description="test source XML"
mode="acquireAndDeduplicate"/>
    </startAcquisitionSessionResult>
  </body>
</envelope>

```

```
</startAcquisitionSessionResult>
</body>
</envelope>
```

Supervision with the Event Handler Framework

Use

Jobs, acquisition and rating sessions can be monitored through the use of events that are generated at a regular frequency. Because event handlers follow a specific framework, new handlers can be developed at reduced costs depending on specific customer business.

Consult online the SAP CC BART Server Javadoc from the SDK or in SAP Help Portal at: <http://help.sap.com/cc> → SAP CC 3.0 → Development → BART Server Javadoc.



NOTE

BART Server is provided with a file report event handler. These output files report the occurrence of acquisition and rating stop events.

Activities

- Specify and implement your customized report handler according to the Java API specification of SAP Convergent Charging.

Setting up the Customized Event Handlers

Use

You can configure different report handlers that are active in the SAP CC BART Server including the default file report handler and customized report handlers.

An event handler is mainly defined by the following elements:

- A Java class implementing the event handler framework which describes how events are handled.
- A property file, needed for initializing the handler.
- A list of topics to which the handler will be sensitive. The list of available topics are:
 - Acquisition topic: Refers to any events related to an acquisition session (start, stop and status)
 - Rating topic: Refers to any events related to a rating session (start, stop and status).
 - Job topic: Refers to any events related to a job execution (start, stop and status).

Prerequisites

You have developed an event handler based on the Event Handler Framework.

Procedure

- Consult the `bart.config.sk` file for detailed information
- When relevant, create a `bart.config` file based on this skeleton file
- Edit and change your `bart.config` file by setting up the necessary parameters
- Set the number of customized event handlers (`report.handler.number`)
- For each handler, set the class name, the property file and the subscribed topics
- Save the file

- Restart the server

**NOTE**

By default, the SAP CCBART Server is provided with a file report handler. The following settings are available:

- **report.handler.number** = 1
- **report.handler.1** = com.highdeal.bart.event.handler.FileReportHandler

Job Framework

Use

The SAP CC BART Server has its own scheduler for triggering jobs that must follow a framework. New jobs can be developed at reduced costs depending on specific customer requests. Jobs are defined by a status (active or inactive), a state (running or not running), a recurrence or a polling period.

Consult the online Help of the SAP CC Javadocs from the SDK or in SAP Help Portal at: <http://help.sap.com/cc> → SAP CC 3.0 → Development → BART Server Javadoc.

Activities

- Specify and implement your customized event handler according to the Javadoc of SAP Convergent Charging.

11 Configuration of the BART Database

The SAP CC BART Server is an optional software component of SAP Convergent Charging used in a scenario for offline charging. It is connected to the BART Database that stores technical data.

Before you start using the BART Server, you must configure partitioning mechanism:

- The number of business traffic days kept in the database (default: 40 days)
- The number of partitions which must be created in advance

Partitioning

SAP Convergent Charging is designed for managing and storing a large volume of data. The partitioning is necessary to improve BART's performances when storing a large number of Consumption Detail Records (CDRs) in the BART database. The partitioning will help the DBA to administrate the databases especially for purging and archiving the data as described in the *Operations Guide for SAP CC 3.0*.

The procedures listed in this section enable you to configure:

- The number of days kept in the database
- The number of days or partitions that are created in advance
- How partition creation is triggered (manually or automatically)
- The directories used to store the tablespaces or filegroups



NOTE

You must be connected as DBA to your RDBMS to use the following procedures.



RECOMMENDATION

Update the partitioning configuration periodically to make the partition creation policy compliant with your real traffic.


Setting up the Partitioning Configuration

Setting up the Partitioning Configuration for MS SQL Server

Overview

This table describes the package procedures to use for configuring the partitioning feature.

Procedure	Description
CONFIGURE	This procedure allows the DBA to configure the global partitioning

	policy. This procedure fills in the PARTITION_PURGE table with the parameters specified as arguments.
ADD_DIRECTORY	<p>This procedure allows creating a new directory, to resize an existing directory or to reactivate a removed one for storing filegroups.</p> <div>  NOTES <ul style="list-style-type: none"> ■ Each filegroup name is unique and is of the form BART_yyyymmdd where yyyymmdd is a date. ■ You must create one directory at least at installation. </div>
REMOVE_DIRECTORY	This procedure allows the DBA to remove a directory which is no more used for storing new filegroups.
MANAGE_NEW_PARTITION	This procedure allows the DBA to manually trigger the creation of new partitions. New partitions are created if needed.

**NOTE**

To automatically trigger partition creation, create a job in SQL Server which calls the **MANAGE_NEW_PARTITION** procedure.

Prerequisites

- You have determined the number of days the CDRs are kept

Procedures


Execute the following procedures with the required arguments:

Procedure	Arguments	Description
CONFIGURE	partitionDays (integer)	The number of days kept in the database (default: 40 days)
	partitionAdvanceDays (integer)	The number of partitions which must be created in advance
ADD_DIRECTORY	directory (varchar)	Pathname (2.000 characters at maximum)
	fileSize (varchar, default: '1GB')	Initial size
	extendSize (varchar, default: '250MB')	The size of the directory
REMOVE_DIRECTORY	directory (varchar)	The directory to be removed
MANAGE_NEW_PARTITION	None	

Setting up the Partitioning Configuration for Oracle

Overview

This table describes the package procedures to use for configuring the partitioning feature.

Procedure	Description
BART_ARCHIVE_PURGE.CONFIGURE	This procedure allows the DBA to configure the global partitioning policy. This procedure fills in the PARTITION_PURGE table with the parameters specified as arguments.
BART_ARCHIVE_PURGE.ADD_DIRECTORY	<p>This procedure allows creating a new directory, to resize an existing directory or to reactivate a removed one for storing tablespaces.</p> <div>  NOTES <ul style="list-style-type: none"> ■ Each tablespace name is unique and is of the form BART_yyyymmdd where yyyymmdd is a date. ■ You must create one directory at least at installation. ■ Resize the directory if the initial size is exceeded. </div>
BART_ARCHIVE_PURGE.CONFIGURE_TABLESPACE	This procedure allows you to configure tablespace names.
BART_ARCHIVE_PURGE.REMOVE_DIRECTORY	This procedure allows the DBA to remove a directory which is no more used for storing new tablespaces.
BART_ARCHIVE_PURGE.MANAGE_NEW_PARTITION	This procedure allows the DBA to manually trigger the creation of new partitions. New partitions are created if needed.
BART_ARCHIVE_PURGE.START_SCHEDULER	This procedure activates the Oracle database scheduler for calling each day (at 2:00 AM), the MANAGE_NEW_PARTITION procedure.
BART_ARCHIVE_PURGE.STOP_SCHEDULER	This procedure stops the MANAGE_NEW_PARTITION scheduling.
BART_ARCHIVE_PURGE.RUN_SCHEDULER	This procedure is equivalent to the START_SCHEDULER procedure except that the first execution of the MANAGE_NEW_PARTITION procedure is immediate.

Procedures

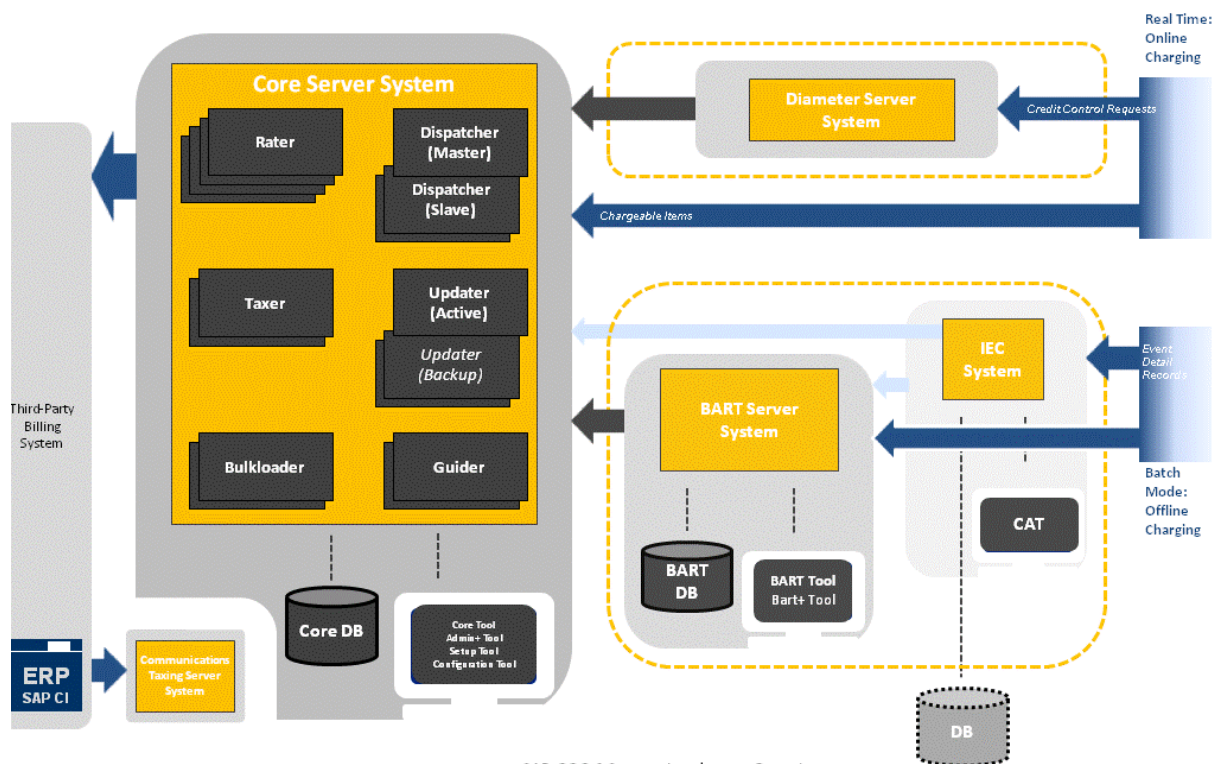
Execute the following procedures with the required arguments:

Procedure	Arguments	Description
BART_ARCHIVE_PURGE.CONFIGURE	partitionDays (integer)	The number of days kept in the database (default: 40 days)
	partitionAdvanceDays (integer)	The number of partitions which must be created in advance
BART_ARCHIVE_PURGE.ADD_DIRECTORY	directory (varchar)	Pathname (2.000 characters at maximum)
	fileSize (varchar, default: '1GB')	Initial size. The maximal size is 128G.
	extendSize (varchar, default: '250MB')	The size of the directory, automatically increased by Oracle if needed
BART_ARCHIVE_PURGE.CONFIGURE_TABLESPACE	tablespaceprefix (varchar)	The prefix of the tablespace name, default is "BART_".
	tablespacesuffix (varchar)	The suffix of the tablespace name, it is located after the date of the form <code>yyyymmdd</code> .
	datafilesuffix (varchar)	The suffix of the datafile, default is ".dat".
BART_ARCHIVE_PURGE.REMOVE_DIRECTORY	directory (varchar)	The directory to be removed
BART_ARCHIVE_PURGE.MANAGE_NEW_PARTITION	none	
BART_ARCHIVE_PURGE.START_SCHEDULER	none	
BART_ARCHIVE_PURGE.STOP_SCHEDULER	none	
BART_ARCHIVE_PURGE.RUN_SCHEDULER	none	

12 Configuration of the Diameter Server

The SAP CC 3.0 Diameter Server is an optional software unit of SAP Convergent Charging used in a real time scenario for handling the mediation and credit control functions in front of SAP CC. These functions are based on the diameter protocol, an authentication, authorization, and accounting protocol for networks.

The Diameter Server is a connector system that communicates with the SAP CC Core Server system and with a network element:



SAP CC 3.0 System Landscape Overview

Configuration Files and Tools

You can configure the SAP CC Diameter Server system by editing the configuration files listed in the *Installation Guide* on SAP Service Marketplace.

Each file includes detailed information. They are located in the folders:
 /usr/sap/<SID>/CAD<id>/config/ (on UNIX) or <drive>:\usr\sap\<SID>\CAD<id>\config\ (on Windows).

Technical Settings

Setting up the Quick Configuration

Use

For checking that the SAP CC Diameter Server system can run, few parameters must be set up.

Procedure

- Stop the SAP CC Diameter Server system
- Edit the serverConfig.xml file located in the configuration folder
- Set the following parameters in the different sections:

Parameter	Description
URI	IP address of the host that runs the Diameter Server system
OCSHostName	IP address(es) of the host(s) that run(s) the SAP CC Core Server system
OCSPort	Port number of Core Server (usually 2000)
OperationTimeout	Timeout (in ms) of the charging request

- Restart the server

Setting up the Basic Configuration

Use

The serverConfig.xml file includes several sections:

- Stack identity parameters
- Capabilities exchange parameters
- Supported Application Ids
- Supported Vendor Ids
- Peer policy parameters
- Incoming messages handling parameters
- Routing table to handle proxiable requests
- Charging Stack parameters
- Log level (can be changed dynamically)

You can set the parameter values according to your business and your usage of SAP CC Diameter Server system. Consult first the *Technical Reference Guide* on SAP Service Marketplace (see page [\[37\]](#)).

Procedure

- Stop the SAP CC Diameter Server system
- Edit the serverConfig.xml file located in the configuration folder
- Set the following parameters in the different sections



NOTE

The parameter RootLoggerLevel can be changed while the Diameter Server is running. More precisely, Diameter Server reads the server configuration file periodically and changes the log level according to the value set.

Enabling and Setting up the SLD Data Supplier Function

Use

The SAP CC 3.0 Diameter Server system can send information data to the SLD when starting. By default, this function is not enabled at installation time. You have to configure manually the Diameter Server system to connect to the SLD and to send data.

Prerequisites

- A SLD server is up and running
- The Component Repository Content (CR Content) in the System Landscape Directory (SLD) is up-to-date (see SAP Note [669669](#))

Procedure

- Stop the SAP CC Diameter Server system
- Edit the serverConfig.xml file
- Enable the function by setting up a valid URL for the SLD server
- Change the communication parameters to the appropriate values:

Communication Parameters	
SLDURL	The full and valid URL of the SLD server Ex.: http://<SLD_HOST>:<SLD_HOST_PORT>/sld/ds
SLDUser	The username for the log on to the SLD server for authentication
SLDPasswd	The password for the username needed for authentication

- Restart all the Diameter Server systems to apply the changes
- Check that the payload data are properly sent to the SLD server

Setting up the Logging and Tracing Function

Use

By default, five rotating log files are generated by the SAP CC Diameter Server.

Procedure

- Stop the SAP CC Diameter Server system
- Edit the logging.properties file located in the configuration folder
- Set the parameters according to your business
- Restart the server

Business Settings

Changing the Settings of the Service Dictionary

Use

The Service Dictionary is designed by the project team during the implementation phase.



CAUTION

A system administrator must not change these settings.

Prerequisites

The technical consultant has prepared the configuration changes according to the data flow (see implementation tasks).

Procedure

- Stop the SAP CC Diameter Server
- Edit the serviceDictionary.xml file located in the configuration folder.
 - This file is only read when the Diameter Server starts
- Set the parameters according to your business
- [Restart the server](#) and check the logs

Changing the Settings of the AVP Dictionary

Use

The AVP Dictionary is designed by the project team during the implementation phase.



CAUTION

A system administrator must not change these settings.

Prerequisites

The technical consultant has prepared the configuration changes according to the data flow (see implementation tasks).

Procedure

- Stop the SAP CC Diameter Server
- Edit the avpDictionary.xml file located in the configuration folder. This file is only read when the Diameter Server starts
- Set the parameters according to your business
- [Restart the server](#) and check the logs

Implementation Tasks

This section lists the configurations determined by the solution consultants and by the technical consultants of your project team.

Setting up the Service Dictionary

Use

Consult first the *Technical Reference Guide* on SAP Service Marketplace.

Procedure

- Stop the SAP CC Diameter Server
- Edit the serviceDictionary.xml file located in the configuration folder

- Set the parameters according to your business
- [Restart the server](#) and check the logs

Setting up the AVP Dictionary

Use

Consult first the *Technical Reference Guide* on SAP Service Marketplace.

Procedure

- Stop the SAP CC Diameter Server
- Edit the avpDictionary.xml file located in the configuration folder
- Set the parameters according to your business
- [Restart the server](#) and check the logs



CAUTION

The Service-Parameter-Value AVP has to be defined in the dictionary since it is not supported in 3GPP any longer.

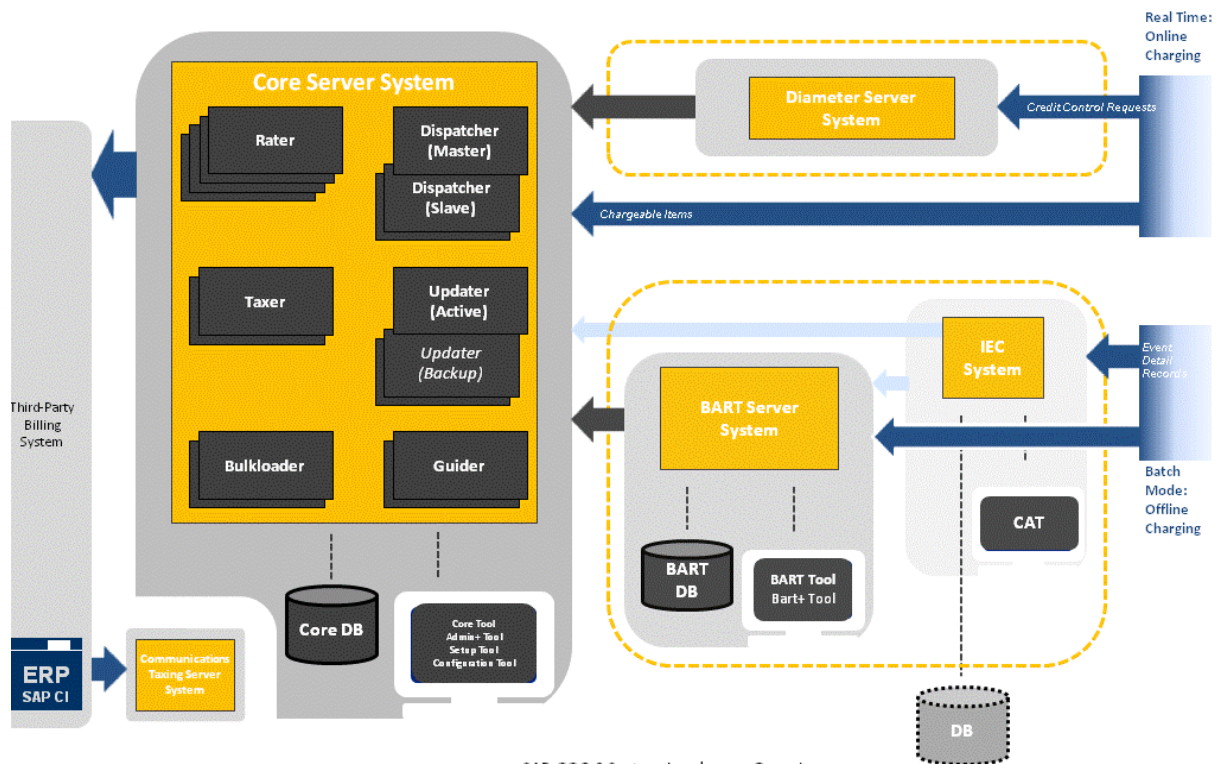


EXAMPLE OF CONFIGURATION FILE

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- Specific AVP Dictionary for Diameter Server -->
<avpDictionary version="1.0" date="2008-01-01T00:00:00">
  <avpDesc name="Call-Type" code="943" type="UTF8String" vendorId="12084"/>
  <avpDesc name="Service-Parameter-Value" code="442" type="OctetString" vendorId="12084"/>
  <avpDesc name="Service-Information" code="873" type="Grouped" vendorId="10415"/>
  <avpDesc name="Service-Generic-Information" code="1256" type="Grouped" vendorId="10415"/>
  <avpDesc name="Deny-Reason" code="10027" type="Enumerated" vendorId="11"/>
  <avpDesc name="Play-Announcement-Id" code="10045" type="Unsigned32" vendorId="11"/>
  <avpDesc name="Subscriber-Profile" code="10008" type="Grouped" vendorId="11"/>
  <avpDesc name="Subscriber-Language" code="10009" type="UTF8String" vendorId="11"/>
</avpDictionary>
```

13 Configuration of the IEC

Basic Settings



SAP CC 3.0 System Landscape Overview

Setting up a Scenario

Use

SAP CC 3.0 uses some scenario files to configure the SAP CC Import/Export Connector application.

Consult the online Help of the SAP CC Connector Administration Tool in SAP Help Portal: <http://help.sap.com/cc> → SAP CC 3.0 → CAT → About Scenario. You can access to the online Help from the graphical user interface.

Procedure

- Start the Connector Administration Tool (CAT) and log on.
- Create a new scenario and save it in a file: CAT → File → New → Scenario.

Implementation Tasks

This section lists the configurations determined by the solution consultants and by the technical consultants of your project team.

Implementing Java Classes for Adding Functions

Use

You can customize your SAP CC Import/Export Connector (IEC) application by adding your own Java classes. You can add new actions, customize the reporting or customize the connection with the SAP CC BART Server.

You can customize your application with the Java Library provided by SAP Convergent Charging in a Software Development Kit (SDK):

Function	Technical Interface	Software Units	Technical Operation or API
Customization of New Functions for an IEC	Java	IEC SDK	<ul style="list-style-type: none">■ Java Package:<ul style="list-style-type: none">● com.highdeal.iec■ Java Class:<ul style="list-style-type: none">● JavaTask● UserLogger● AcquisitionSessionReportHandler


For more technical details, consult online the SAP CC IEC Javadoc in SAP Help Portal: <http://help.sap.com/cc> → SAP CC 3.0 → Development → Import/Export Connector Javadoc.

Activities






As technology consultant, you have to:

- Specify and implement your Java classes according to the Java API Specification of SAP Convergent Charging.

Typographic Conventions

Type Style	Description
	Arrows separating the parts of a navigation path, for example, menu options.
<i>Example Text</i>	Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options. Cross-references to other documentation
Example text	Emphasized words or phrases in body text, graphic titles, and table titles
EXAMPLE TEXT	Technical names of system objects. These include report names, program names, transaction codes, table names, and key concepts of a programming language when they are surrounded by body text, for example, SELECT and INCLUDE.
Example text	Output on the screen. This includes file and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.
Example text	Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation.
<Example text>	Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system, for example, “Enter your <User name>”.
EXAMPLE	Keys on the keyboard, for example, F2 or ENTER .

Icons

Icon	Meaning
	Caution
	Example
	Note
	Recommendation
	Syntax

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