Transition Guide
SAP Convergent Charging 2021
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Activation of Consumption Item Management in SAP Convergent Charging and SAP Convergent Invoicing

How to Configure SAP Convergent Charging and SAP Convergent Invoicing to Enable Support of Consumption Item Management



Typographic Conventions

Type Style	Description
Example	Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options. Textual cross-references to other documents.
Example	Emphasized words or expressions.
`EXAMPLE`	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`	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`	Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation.
`<Example>`	Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.
`EXAMPLE`	Keys on the keyboard, for example, `F2` or `ENTER`.

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Document History

Version	Date	Change
1.0	October 2021	First version

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1 What's New in This Document

This section highlights the main changes in this *user assistance*. They relate both to new or changed features in the software deliveries of SAP Convergent Charging 2021 and to documentation enhancements for enriching your SAP user experience continuously.

1.1 What's New in FPS 0

As of FPS 0:

- Minor change: The new chapter Related Documentation contains links to the SAP Help Portal.

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2 Introduction

SAP Convergent Invoicing in SAP ERP provides a feature about consumption item storage. This guide describes the procedure to be applied in SAP Convergent Charging and in SAP Convergent Invoicing to enable the support of consumption item storage of SAP Convergent Invoicing by SAP Convergent Charging.

2.1 Target Audience

This guide is for implementation project teams and administrators who already have a working platform including SAP Convergent Charging and SAP Convergent Invoicing and who want to know how to upgrade it to benefit from the features of consumption item storage. In this context, upgrading means to move from an SAP system landscape where SAP Convergent Charging rates or rerates chargeable items to a landscape where SAP Convergent Charging rates chargeable items and SAP Convergent Invoicing rates and rerates high volumes of chargeable items. In both landscapes, BART Server is still involved in the rating of chargeable items.

> **Note**
>
> The support of the consumption item storage by SAP Convergent Charging for a new implementation project is already described in other documentation, and therefore it is out of scope of this guide.

2.2 About This Document

This guide is structured into nine sections. After the overview in Section 2 and the enumeration of the constraints and limitations regarding the transition in Section 3, the remaining sections explain the different actions needed for successful enablement of the support of consumption item storage. Section 9 gives you additional information about some procedures.

2.3 Before You Start

The consumption item storage feature of SAP Convergent Invoicing stores a high volume of consumption items. A consumption item is the record of the consumption of a service by an end consumer (often called consumption detail record in telecommunication industry). The consumption item represents the transactional data for three main business scenarios:

- CI Triggered Rating
- Manual Capturing
- Rerating

When SAP Convergent Invoicing is integrated with SAP Convergent Charging, a consumption item is a chargeable item consolidated with the information related to an end customer, such as the provider contract of the

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consumer; for example. SAP Convergent Charging can charge a consumption item converted into a chargeable item, and this charging operation may generate billable items.

This guide assumes that the reader already knows the concepts of consumption items, chargeable items, and the different business scenarios related to this transactional data.

For more information about these scenarios, see the *SAP CC Application Help* documentation.

Furthermore, the reader must be familiar with the following tasks to execute the migration procedure:

- The start, stop, or restart of the instances of the SAP CC systems (see the section *Starting and Stopping the Server Systems* in the *SAP CC Installation Guide*)
- The change of the instance configuration parameters (see the primary help for the Cockpit and Admin+ user interfaces)
- The synchronization of the chargeable item classes and consumption item classes (see the section *Managing and Maintaining SAP CC* in the *SAP CC Application Help*)

2.3.1 Terms and Acronyms

Term	Acronym	Definition
Batch Acquisition and Rating Toolset	BART	Component dedicated to the CDR offline acquisition and to the batch charging of converted CDRs. These processes define together the Rating business scenario. If not mentioned, the acronym 'BART' stands for BART Server or BART database depending on the context.
Consumption Detail Record	CDR	Chargeable items in SAP Convergent Charging or consumption items in SAP Convergent Invoicing
Charging output Integration Framework	CIF	The Charged item Integration Framework (versions of SAP Convergent Charging earlier than 4.0) is enhanced to support the process of chargeable items output by SAP CC rater instances. From version 4.0 onwards, this framework keeps the same acronym but is named Charging output Integration Framework (CIF).
Enhancement Package	EhP	
SAP Convergent Invoicing	SAP CI	
SAP Convergent Charging	SAP CC	

2.4 Related Documentation

SAP Convergent Charging

You can find the SAP CC 2021 documentation on SAP Help Portal at: https://help.sap.com/cc.

SAP Convergent Invoicing

You can find the documentation about SAP Convergent Invoicing at: https://help.sap.com/erp608 > *Application Help > SAP Library > Industries in SAP ERP > SAP for Telecommunications > Contract Accounts Receivable and Payable > SAP Convergent Invoicing*.

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3 Transition Overview

The starting point of this transition is a working landscape including SAP Convergent Charging systems (BART Server and Core Server) and SAP Convergent Invoicing (in the ERP system) as shown in the following illustration:

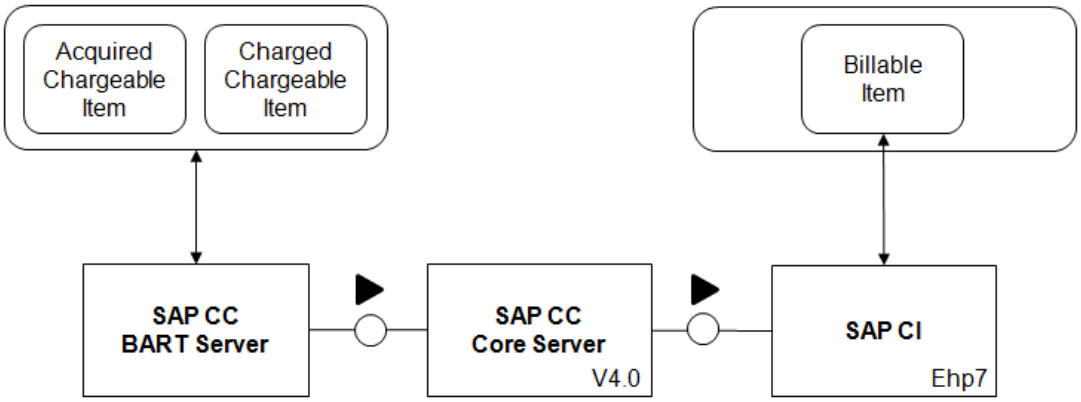


Figure 1: Working Landscape

In this production SAP system landscape, SAP Convergent Charging is the master component of the rerating process, and the BART Server system of SAP Convergent Charging executes the rerating process. The BART Server system only processes chargeable items stored in its database (acquired and charged chargeable items). When the Core Server system charges chargeable Items, it generates charged items that are loaded as billable items into SAP Convergent Invoicing for the invoicing process.

The principle of this transition consists in filling SAP Convergent Invoicing in SAP ERP with consumption items for enabling the rerating process provided by SAP Convergent Invoicing. This is done in three phases as shown in the following timeline:

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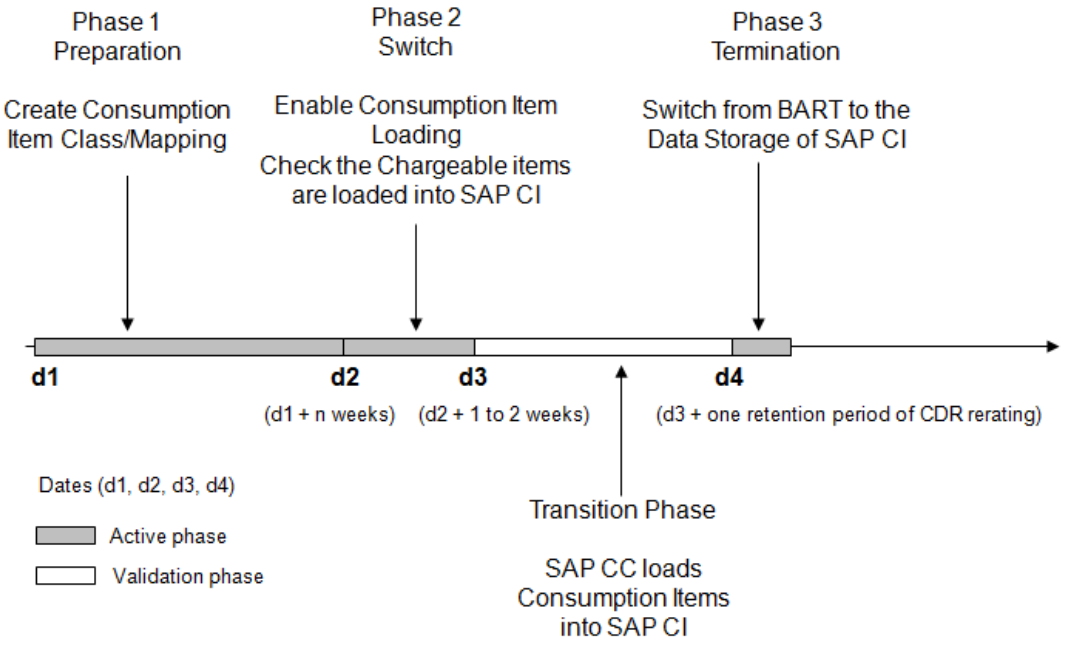


Figure 2: Transition Timeline

This timeline shows the active and validation phases:

- An active phase is a period during which the administrator must perform actions on the system landscape to enable or configure the required features.
- The validation phase is a period during which the administrator must check, and then validate, that the actions previously performed work perfectly.

3.1 Phase 1: Preparation

During phase 1, the administrator prepares the transition phase:

- The chargeable item packages are removed. The chargeable item classes of these packages will exist as independent objects.
- The consumption item classes related to the already existing chargeable item class are created in SAP Convergent Invoicing, and then synchronized in SAP Convergent Charging.

> **Note**
>
> This guide describes a complete transition meaning that each chargeable item class of the SAP CC system must have its related consumption item class in the SAP CI system and will generate consumption items. If a chargeable item class is not mapped onto a consumption item class, the SAP CC system will reject the charging and acquisition of the chargeable items of this class.

The duration of phase 1 depends on the number of chargeable item classes to be synchronized with consumption item classes. You need to plan several weeks to complete phase 1 successfully.

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3.2 Phase 2: Switch

The goal of phase 2 is to enable SAP Convergent Charging for loading consumption items into SAP Convergent Invoicing. The working landscape is shown in the following figure where the thick arrow means that SAP Convergent Invoicing handles consumption items:

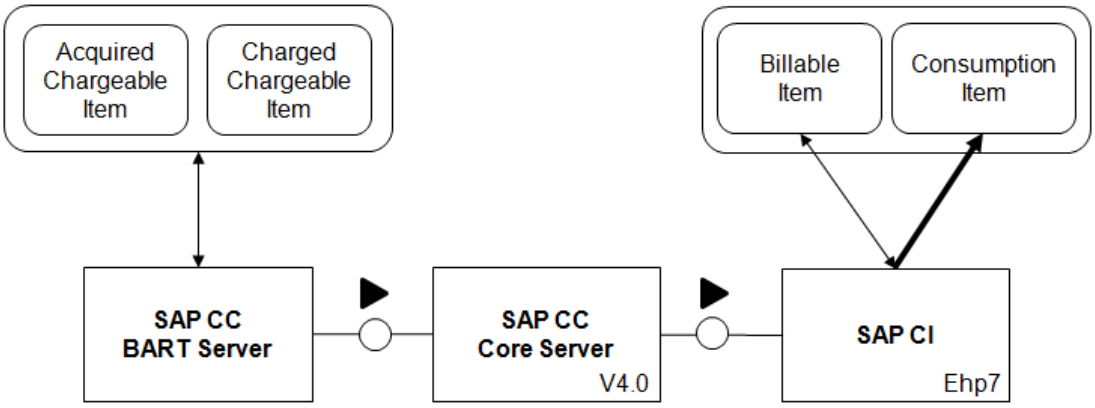


Figure 3: Phase 2, Switch

According to *Figure 3*, SAP Convergent Invoicing writes consumption items to its database but does not work with consumption items, except when SAP Convergent Invoicing removes the consumption items corresponding to reversed billable items during a rerating operation.

In *Figure 3*, SAP Convergent Charging performs the rerating. Chargeable items (CDRs) are stored in BART while consumption items are stored twice:

- In SAP Convergent Charging when the BART Server system charges or recharges chargeable items
- In SAP Convergent Invoicing for preparing and handling the future rerating process

The duration of phase 2 is estimated at one or two weeks. The administrator first has to configure SAP Convergent Charging (< 4 hours), to check that the consumption items are successfully loaded into SAP Convergent Invoicing, and to fix the issues which can occur. At the end of phase 2, the working landscape is well configured and the transition phase can start.

3.3 Transition Phase

During the transition phase, the chargeable items (converted into consumption items) are successfully loaded into SAP Convergent Invoicing. The duration of the transition phase is at least one CDR retention period, that is, the maximum duration (usually several months) to keep consumption items for rerating purposes.

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3.4 Phase 3: Termination

After the transition phase, SAP Convergent Invoicing contains enough consumption items to support the rerating process. The working landscape is configured so that SAP Convergent Invoicing performs the rerating process (the rerating process is deactivated in SAP Convergent Charging):

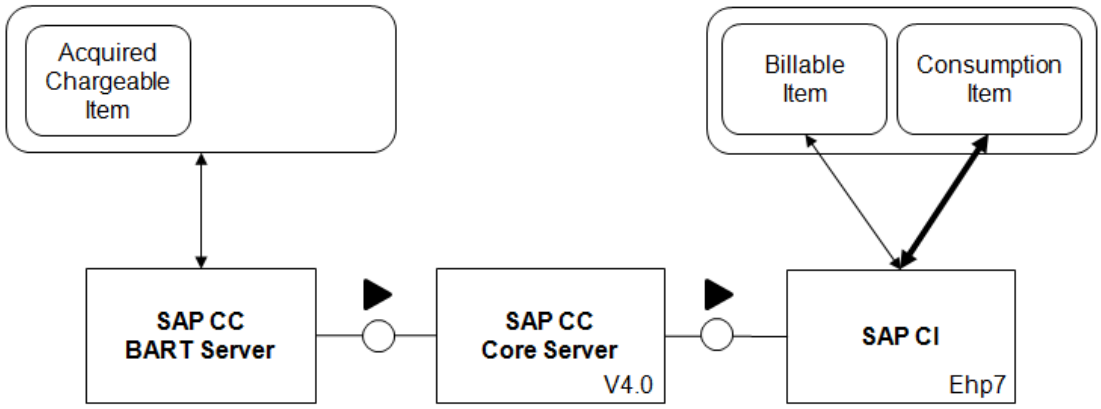


Figure 4: Phase 3

In *Figure 4*, SAP Convergent Invoicing handles and processes consumption items.

3.5 Prerequisites, Limitations, and Warnings About the Procedure

Keep in mind the following:

- Consumption item management is only available for provider contract-based business.
  - Subscription-based business is not supported, and system landscapes must keep BART in SAP Convergent Charging (no transition is possible).
  - Subscription and provider contract-based business are not supported together, and system landscapes must keep BART in SAP Convergent Charging (no transition is possible).
- Only monocatalog-based business can be integrated with SAP Convergent Invoicing (one service provider for rerating operations)
- We recommend testing the procedures first in a test landscape.
- After the transition, the generator of provider contract locks changes from SAP Convergent Charging to SAP Convergent Invoicing. A lock code already used by SAP Convergent Charging can be computed again by SAP Convergent Invoicing even if this probability is very low. Therefore, if the provider contracts are searched in SAP Convergent Charging from a lock code computed by SAP Convergent Invoicing, some provider contracts are included even if they were not rerated by SAP Convergent Invoicing.
- The rerating operation in SAP Convergent Invoicing is available after the complete retention period of chargeable items for rerating purposes (after 40 to 180 days). It is also the case for CI triggered rating and manual capturing. We recommend that you plan enough time to execute this transition phase.

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- SAP Convergent Charging will generate chargeable items that it will convert into consumption items saved in temporary files. The hard disk of the system landscape must be enhanced to support the creation of new files (about several megabytes).
- SAP Convergent Invoicing uses a technical SAP CC user for the rating and rerating processes. SAP Convergent Invoicing also uses the same SAP CC user for the replication process of provider contracts.

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4 About the Procedure

You must apply the procedure in three phases (phase 1, phase 2, and phase 3). It is strongly recommended that you apply the procedure to the test landscape, and then transport the different configurations to the production landscape.

You must execute the steps of the procedure according to the following sequences:

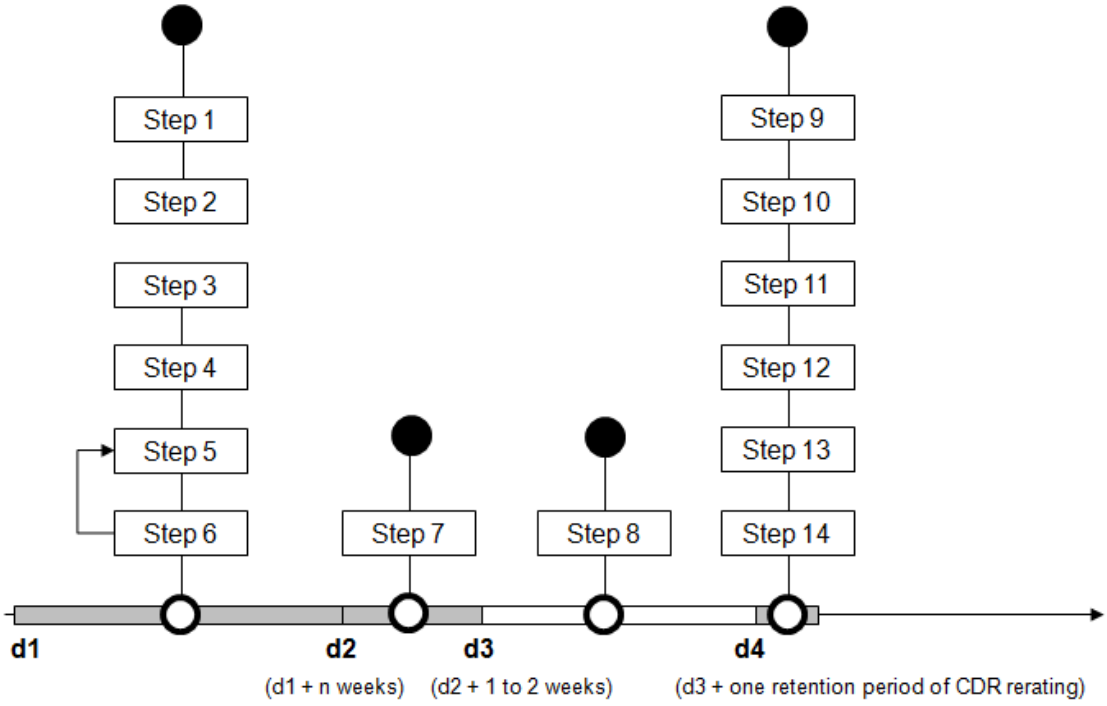


Figure 5: Sequences of steps

Note: You can execute step 5 and step 6 sequentially in one of the following ways:

- For all the chargeable item classes at one time (first step 5, and then step 6)
- For each chargeable item class, chargeable item class by chargeable item class (step 5, step 6, step 5, step 6, and so on)

The overall procedure consists of the following steps:

Phase 1: Preparation

- Step 1 (SAP CC): Remove the links between chargeable item packages and chargeable item classes
- Step 2 (SAP CC): Enable the synchronization of consumption item classes
- Step 3 (SAP CI): Activate the 'Link with Consumption Items' interface component for billable item classes

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- Step 4 (SAP CC): Update the billable item mapping
- Step 5 (SAP CI): Create a consumption item class for each existing chargeable item class
- Step 6 (SAP CC): Synchronize the chargeable item classes of SAP CC with the consumption item classes of SAP CI

Phase 2: Switch

- Step 7 (SAP CC): Enable the loading of consumption items to SAP CI in SAP ERP

Phase: Transition

- Step 8 (SAP CI): Customizing for the transition phase

Phase 3: Termination

- Step 9 (SAP CC): Start the charging/recharging Web service
- Step 10 (SAP CI): Create an SAP Convergent Charging logical port for the Web Service Consumer Proxy
- Step 11 (SAP CI): Customizing for phase 3
- Step 12 (SAP CC): Enable SAP CC to support the rerating process of SAP CI
- Step 13 (SAP CC): Enable the archiving of CDRs in BART Server
- Step 14 (SAP CC): Extend the retention period of counter snapshots for high-volume management purposes

Conventions for describing a procedure step

Each step is described in a table as follows:

Step Identifier	
When	The time at which the step must be performed
Who	The required role or the permission of the agent who performs the step
How	The tool to perform the step
Before the Task	The list of actions that the agent must perform before performing the step
Task	A short description of the step
Step	The list of actions that the agent must perform during the step
After the Task	The list of actions that the agent must perform to check that the step is successful

In this procedure, it is assumed that the SAP Convergent Charging installation tool (*SAPInst*) has installed a dispatcher instance in the **INST_DIR** directory.

The **INST_DIR** path may look like this: '**...\usr\sap\<SID>\CCD##**' where:

- **SID**: Is the *SAP System ID* of the SAP Convergent Charging system
- **##**: Is a number

If several directories match the **INST_DIR** pattern, use the one having the lowest **##**.

It is also assumed that the SAP Convergent Charging installer has installed its shared file repository in the directory '**REPO_DIR**'. The **REPO_DIR** path may look like this: '**...\usr\sap\<SID>\SYS\exe\uc\<PLATFORM>**' where:

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- **SID**: Is the *SAP System ID* of the SAP Convergent Charging system
- **PLATFORM**: Is a platform-specific folder

The path shortcut **<REPO_CONFIG_DIR>** is the shortcut for the directory '**<REPO_DIR>/CC_CORE_SERVER/config/sapci/**'.

For this procedure, the required SAP Convergent Charging tools are available in the '**INST_DIR/script/**' of a dispatcher instance.

The scripts 'setup', 'config' and 'admin+' launch the tools 'Setup Tool', 'Config Tool', and 'Admin+' respectively.

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5 Procedure Checklist

Before starting the procedure, check that:

- The version of SAP Convergent Charging is at least SAP Convergent Charging 4.0 or above. If this is not the case, upgrade to the latest SAP Convergent Charging version. For more information about how to upgrade SAP Convergent Charging, see the related documentation (*SAP CC Upgrade Guide*). See section 9.2 for how to check the software component version of SAP Convergent Charging that is running. The technical version number must be equal or greater than 4.5.0.0.
- The version of SAP Convergent Invoicing is at least SAP ERP EhP7 or above. If this is not the case, upgrade to the latest SAP Convergent Invoicing enhancement package. For more information about how to upgrade SAP Convergent Invoicing and SAP ERP, see the related documentation.

The systems to be updated fulfill the prerequisites defined in section 2.5.

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6 Procedure - Phase 1

6.1 Steps of Phase 1

6.1.1 Step 1 - SAP CC

SAP Convergent Charging executes this step.

Remove the Links Between Chargeable Item Packages and Chargeable Item Classes	
When	During the preparation phase, but before the synchronization of the chargeable item classes with the consumption item classes between SAP Convergent Charging and SAP Convergent Invoicing. **Note**: Because this step requires restarting the instances, it is strongly recommended to execute this step when the workload of the SAP Convergent Charging Server instances is the lowest.
Who	Administrator
How	Setup Tool
Before the Task	N/A
Task	Remove the references to the chargeable item packages of chargeable item classes. This ensures that the identifiers of the chargeable item classes are unique between all the chargeable item classes of the system.
Step	**1**. Generate the chargeable item package migration report. **a**) Execute the command with the Setup Tool user interface: `setup migration generateCIPackageReport ./chargeableItemPackageMigrationReport.xml` **b)** Enter your login and password at the prompt. **c)** Check on the console that the report has been successfully exported. **Note**: If the report cannot be exported because some invalid charge components have been found, first fix the listed charge components, and start the generation of the report again. **2**. Open the report with a text editor (an XML editor is recommended) and, as described in the header of the XML file, provide the name of the new chargeable item classes when requested. **3**. Save your changes. **4**. Stop the updater instances of the SAP CC system. **5**. Execute the report.

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Remove the Links Between Chargeable Item Packages and Chargeable Item Classes	
	a) Execute the command: `setup migration executeCIPackageReport ./chargeableItemPackageMigrationReport.xml` **b)** Enter your login and your password at the prompt. **c)** Check on the console that the report has been successfully executed. **Note**: If the report cannot be executed, read the error message displayed on the console, try to fix the problem, and then execute again the report. **6**. If you have NOT planned to execute the next step right now, apply the configuration by restarting the Updater instances.
After the Task	N/A

6.1.2 Step 2 - SAP CC

SAP Convergent Charging executes this step.

Enable the Synchronization of Consumption Item Classes	
When	After step 1 is successfully executed. **Note**: Because this step requires restarting the instances, it is strongly recommended to execute this step when the workload of the SAP Convergent Charging instances is the lowest.
Who	Administrator
How	Admin+, Setup Tool, and Core Tool (only for validation)
Before the Task	Open the SAP Convergent Charging Core Tool user interface, and then check that the menu "**File > New > Consumption Item Mapping**" is not available; otherwise, skip this step.
Task	The goal of this step is to configure SAP Convergent Charging for enabling the consumption item class synchronization from SAP Convergent Invoicing to SAP Convergent Charging. **Note**: During this step, you make a backup of the configuration parameter that the procedure of recovery (section 6.3) can reuse later.
Step	**1**. Import the up-to-date, default billable item mapping into SAP Convergent Charging. **a)** Execute the command with the Setup Tool user interface: `setup sapci importDefaultMapping chargedItem <REPO_CONFIG_DIR>/sapci_cit_defaultMapping.xml.sk` **b)** Enter your login and password at the prompt. **c)** Check on the console that the import is successful. **2**. Export the administration parameters of the updater to a file.

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Enable the Synchronization of Consumption Item Classes	

	a) Execute the command with the Config Tool user interface:
	`config configuration export sapccUpdaterInstanceParameters_phase1.xml updater`
	b) Enter your login and your password.
	Note: The configuration parameters of the updater instances are written in the XML file named "**sapccUpdaterInstanceParameters_phase1.xml**" which is stored in the directory where Config Tool was launched.
	c) Check that the file **sapccUpdaterInstanceParameters_phase1.xml** exists, you can open it in a text editor, and it is not empty.
	3. If the Admin+ user interface is not yet connected to a dispatcher, connect Admin+ with the dispatcher instance according to the steps defined in section 9.1.
	4. Check that the SAP Convergent Charging configuration regarding the charged items is correct.
	a) Execute the command:
	`get EIF_EXTERNAL_SYSTEM_CODE_CHARGED_ITEM persistent updater`
	b) Check that the persistent value is '**CI**' as shown in the following snapshot:
	Received from updater#1
	- NAME: EIF_EXTERNAL_SYSTEM_CODE_CHARGED_ITEM (PERSISTENT, updater)
	- ACCESS: read-write (DB)
	- DEFAULT VALUE: None
	- PERSISTENT VALUE: CI
	Note: If the persistent value is not '**CI**', the current system configuration is not compliant with this procedure.
	5. Configure SAP Convergent Charging to enable the consumption item class synchronization.
	a) Execute the command:
	`set EIF_EXTERNAL_SYSTEM_CODE_CHARGEABLE_ITEM CI persistent`
	b) Check that the value of the **EIF_EXTERNAL_SYSTEM_CODE_CHARGEABLE_ITEM** now has a persistent value set to '**CI**' as shown in the following snapshot:
	Received from updater#1
	- NAME: EIF_EXTERNAL_SYSTEM_CODE_CHARGEABLE_ITEM (PERSISTENT, updater)
	- ACCESS: read-write (DB)
	- DEFAULT VALUE: None
	- PERSISTENT VALUE: CI
	6. Import the default additional chargeable item fields.
	a) Execute the command:
	`setup sapci importDefaultMapping chargeableItem <REPO_DIR>/CC_CORE_SERVER/config/standalone/sapcc_ci_additionalFields.xml.sk`

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Enable the Synchronization of Consumption Item Classes	
	b) Enter your login and your password at the prompt. **Note**: Check on the console that the default mapping for the type '**chargeable item**' and the system code '**CC**' is successfully imported. **7**. Import the default field mapping for the chargeable items. **a)** Execute the command: `setup sapci importDefaultMapping chargeableItem <REPO_CONFIG_DIR>/cit_ci/sapci_ci_defaultMapping.xml.sk` **b)** Enter your login and your password at the prompt. **c)** Check on the console that the default mapping for the type '**chargeable item**' and the system code '**CI**' is successfully imported. **8**. Apply the configuration: o Restart the Updater instances of SAP Convergent Charging. o If some instances of the Core Tool are running, you must restart them to take this configuration change into account.
After the Task	Launch the SAP CC Core Tool user interface and check that the menu "**File > New > Consumption Item Mapping**" is now available.

6.1.3 Step 3 - SAP CI

SAP Convergent Invoicing executes this step.

Activate the 'Link with Consumption Items' Interface Component for Billable Item Classes	
When	When the transition project starts.
Who	N/A
How	SAP GUI
Before the Task	N/A
Task	For each billable item class whose '**SAP Convergent Charging**' interface component is activated, activate the '**Link with Consumption Items**' interface component, and regenerate the tables. This additional, activated interface component enables navigation between the consumption items and billable items and vice versa through the display functions.
Step	**1**. In SAP GUI, execute transaction **spro**. **2**. Click the '**SAP Reference IMG**' button. **3**. On the '**Display IMG**' screen, open the activity: **Financial Accounting** > **Contract Accounts Receivable And Payable** > **Convergent Invoicing** > **Basic Functions** > **Billable Item Classes** > **Maintain Billable Item Classes**

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Activate the 'Link with Consumption Items' Interface Component for Billable Item Classes	
	4. See the related documentation for how to add an interface component to a billable item class. **5**. Select your billable item class, select **Change** mode, and then select **Choose Interface Components** (F7). **6**. Add the '**Link with Consumption Items**' interface component to the billable item classes where the interface component '**SAP Convergent Charging**' is activated. **7**. Activate your modified billable item configuration and regenerate (next activity in IMG) your modified billable item classes.
After the Task	N/A

6.1.4 Step 4 - SAP CC

SAP Convergent Charging executes this step.

Update the Billable Item Mapping	
When	After step 3
Who	Administrator
How	Core Tool
Before the Task	N/A
Task	The goal of this step is to update the billable item mapping in SAP Convergent Charging to take into account the '**Link to Consumption Item**' interface component added previously in the billable item classes.
Step	In the Core Tool user interface: **1**. Open each billable item mapping. **2**. Refresh the billable item mapping. **3**. Save the billable item mapping.
After the Task	N/A

6.1.5 Step 5 - SAP CI

SAP Convergent Invoicing executes this step.

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Create a Consumption Item Class for Each Existing Chargeable Item Class	
When	When the transition project starts.
Who	N/A
How	SAP GUI
Before the Task	N/A
Task	For each chargeable item class defined in SAP Convergent Charging, create the related consumption item class, the consumption item class proxy, and the consumption item class custom mapping. You can execute this step chargeable item class by chargeable item class.
Step	In the SAP GUI, for each chargeable item class, and for each chargeable item user field: **1**. Choose the data element of the field. **Note**: Among the available data elements, choose the one that is compliant with the semantic and the technical type of the field. If no data element is compliant, create a new data element for the field. **a)** Choose the domain of the data element: o Among the available domains, choose the one that is compliant with the semantic and the technical type of the field. o If no domain is compliant, create a domain for the data element. **2**. Add a consumption item field in the *Customizing Include* if it does not already exists. **Note**: For more information on how you can name a consumption item field, see section 9.4.1. **3**. Create the consumption item class. **Note**: Do not generate the consumption item tables or functions. For more information on how you can name a consumption item class, see section 9.4.2. **4**. Configure the custom mapping. **5**. Generate the consumption item tables or functions
After the Task	N/A

6.1.6 Step 6 - SAP CC

SAP Convergent Charging executes this step.

Synchronize the Chargeable Item Classes of SAP CC with the Consumption Item Classes of SAP CI	
When	When step 5 is successfully executed for at least one consumption item class synchronized with a chargeable item class.

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Synchronize the Chargeable Item Classes of SAP CC with the Consumption Item Classes of SAP CI	
Who	Administrator
How	Core Tool
Before the Task	Step 2 is successfully executed for all the chargeable item classes existing in SAP Convergent Charging.
Task	Synchronize all the chargeable item classes of SAP Convergent Charging with the consumption item classes of SAP Convergent Invoicing. **Note**: This guide describes a complete transition meaning that each chargeable item class of the SAP CC system must have its related consumption item class in the SAP CI system and will generate consumption items. If a chargeable item class is not mapped onto a consumption item class, the SAP CC system will reject the charging and acquisition of the chargeable items of this class.
Step	See the documentation of SAP Convergent Charging about the synchronization of chargeable item classes (chapter *Managing and Maintaining SAP CC* in the Application Help and chapter *About the consumption item mapping* in the Core Tool primary Help).
After the Task	In the Core Tool user interface, open the consumption item class mapping, and check that it is valid.

6.2 Post Phase 1 - Checklist

This phase lists the checks and actions to be performed after phase 1 is successfully completed.

In SAP Convergent Charging, check that all the chargeable item classes of SAP Convergent Charging are related in the consumption item mapping.

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7 Procedure - Phase 2

7.1 Step 7 - SAP CC

SAP Convergent Charging executes this step.

Enable the Loading of Consumption Items into SAP CI	
When	When all the chargeable item classes are synchronized. **Note**: Because this step requires restarting the instances, it is strongly recommended to execute this step when the workload of the instances is the lowest.
Who	Administrator
How	Setup Tool
Before the Task	N/A
Task	Enable SAP Convergent Charging to output chargeable items in files and load these chargeable items as consumption items to SAP Convergent Invoicing. **Note**: During this step, you make a backup of the CIF configuration that the procedure of recovery (section 6.3) can reuse later.

Step	**1**. Backup the CIF configuration of the Rater instances into a file.
	a) Execute the command with the Setup Tool user interface:
	`setup cif export rater <INST_DIR>/config/cif.rater.config.bck.xml`
	b) Enter your login and your password.
	Note: Check that the file '**<INST_DIR>/cif.rater.config.bck.xml**' exists, it can be opened in a text editor, and it is not empty.
	2. Export the CIF configuration of the rater instances in a file.
	a) Execute the command with Setup Tool:
	`setup cif export rater <INST_DIR>/config/cif.rater.config.old.xml`
	b) Enter your login and your password.
	3. Copy the file "**<REPO_DIR>/CC_CORE_SERVER/config/sapci/cit_ci/cif.rater.config.xml.sk**", and paste it with a new name to "**<INST_DIR>/config/cif.rater.config.new.xml**".
	4. Open the files "**<INST_DIR>/config/cif.rater.config.old.xml**" and "**<INST_DIR>/config/cif.rater.config.new.xml**" in a text editor (an XML editor is recommended).

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Enable the Loading of Consumption Items into SAP CI	

	5. In the file '**cif.rater.config.new.xml**', replace the XML element '**<chargedItemTransactionProcessor>**' by the same XML element of the file "**cif.rater.config.old.xml**".
	6. Save the file '**cif.rater.config.new.xml**'.
	7. Configure the CIF of the rater instances.
	a) Execute the command with Setup Tool:
	`setup cif import rater <INST_DIR>/config/cif.rater.config.new.xml`
	b) Enter your login and your password.
	Note: Check on the console that the CIF configuration is successfully imported.
	8. Backup the CIF configuration of the bulkloader instances into a file.
	a) Execute the command with Setup Tool:
	`setup cif export bulkLoader <INST_DIR>/config/cif.bulkloader.config.bck.xml`
	a) Enter your login and your password.
	Note: Check that the file '**<INST_DIR>/cif.bulkloader.config.bck.xml**' exists, it can be opened in a text editor, and it is not empty.
	9. Export the CIF configuration of the bulkloader instances to a file.
	a) Execute the command with Setup Tool:
	`setup cif export bulkLoader <INST_DIR>/config/cif.bulkloader.config.old.xml`
	b) Enter your login and your password.
	10. Copy the file '**<REPO_DIR>/CC_CORE_SERVER/config/sapci/cit_ci/cif.bulkloader.config.xml.sk**' to the file '**<INST_DIR>/config/**' and rename it '**<INST_DIR>/config/cif.bulkloader.config.new.xml'**
	11. Open the files '**<INST_DIR>/config/cif.bulkloader.config.old.xml**' and '**<INST_DIR>/config/cif.bulkloader.config.new.xml**' in a text editor (an XML editor is recommended).
	12. In the file '**cif.bulkloader.config.new.xml**', replace the '**<bulkReader>**' XML elements whose attribute '**adminParameterPrefixName**' is '**POSTPAID_CIT_READER**' or '**PREPAID_CIT_READER**' by their equivalent nested XML elements located in the '**chargedItemSequence**' XML element of the file '**cif.bulkloader.config.old.xml**'.
	13. Save the file **'cif.bulkloader.config.new.xml**'.
	14. Configure the CIF of the bulkloader instances.
	a) Execute the command with Setup Tool:
	`setup cif import bulkloader <INST_DIR>/config/cif.bulkloader.config.new.xml`
	b) Enter your login and your password.
	Note: Check on the console that the CIF configuration is successfully imported.

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Enable the Loading of Consumption Items into SAP CI	
	15. Apply the configuration by restarting the Bulkloader instances, and then the rater instances.
After the Task	N/A

7.2 Post Phase 2 - Checklist

This section describes the checks and actions to be performed after phase 2 is successfully completed.

Charge a daily CDR batch and check that:

- Chargeable items generated by SAP Convergent Charging are loaded into SAP Convergent Invoicing as consumption items.
- The directories '**SAPCC_CI/ACQUIRED/COM_EXCEPTION**' and '**SAPCC_CI/ACQUIRED/INVALID**' of the working directories of the bulkloader instances are empty; otherwise, determine why the chargeable items cannot be loaded to SAP Convergent Invoicing, fix the issue, and then check this step again.
- Read carefully the recommendation listed in section 7.1.

If the check fails and the system is blocked, undo the configuration, and then apply the step described in section 6.3. Investigate in the logs/traces of SAP Convergent Charging and SAP Convergent Invoicing to figure out the issues, and then fix them before restarting this phase.

When the consumption items are successfully loaded into SAP Convergent Invoicing, the transition phase can start. This means the end of phase 2.

Important: Plan to execute phase 3 at least one rerating retention period later. Section 9.3 describes the procedure for retrieving the rerating retention period of SAP Convergent Charging.

7.3 Error Management

SAP Convergent Charging executes this step.

If phase 2 cannot be completed, apply the following step to undo the changes of phase 2:

Deactivate the Loading of Consumption Items	
When	If the post-procedure fails. **Note**: Because this step requires restarting the instances, it is strongly recommended to execute this step when the workload of the instances is the lowest.
Who	SAP Convergent Charging
How	Setup Tool
Before the Task	N/A

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Deactivate the Loading of Consumption Items	
Task	Deactivate the output of the chargeable items in files and the loading of these chargeable items as consumption items to SAP Convergent Invoicing.

Step	1. Undo the CIF configuration change of the rater instances.
	a) Execute the command with the Setup Tool user interface:
	`setup cif import rater <INST_DIR>/config/cif.rater.config.bck.xml`
	b) Enter your login and your password.
	Note: Check on the console that the CIF configuration is successfully imported.
	2. Undo the CIF configuration of the bulkloader instances.
	a) Execute the command with Setup Tool:
	`setup cif import bulkloader <INST_DIR>/config/cif.bulkloader.config.bck.xml`
	b) Enter your login and your password.
	Note: Check on the console that the CIF configuration is successfully imported.
	3. Apply the configuration by restarting the bulkloader instances, and then the rater instances.

After the Task	Check that the system runs in the same way as before beginning this step.

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8 Transition Phase

8.1 Warning and Recommendation

During the transition phase:

- Do not modify the consumption items in SAP Convergent Invoicing. If some CDRs must be modified, modify the CDRs in BART. The modified CDRs will be transferred from BART to SAP Convergent Invoicing when the CDRs are charged or recharged.
- Do not delete the consumption items in SAP Convergent Invoicing. If some CDRs must be deleted, for example some CDRs which are duplicated, delete the CDRs in BART. The CDRs are never deleted from SAP Convergent Invoicing but are ignored by the rerating process.
- Do not consume the Web Service related to the charging process during the transition phase because the CDRs processed by the Web Service cannot be rerated during the transition phase.

8.2 Step 8 - SAP CI

SAP Convergent Invoicing executes this step.

Customizing for the Transition Phase	
When	When the consumption items are successfully loaded into SAP Convergent Invoicing.
Who	SAP Convergent Invoicing
How	SAP GUI > SPRO > IMG
Before the Task	N/A
Task	Enable phase 2 by entering a transition start date and the retention period of SAP Convergent Charging in *Customizing* for SAP Convergent Invoicing.
Step	In *Customizing* for **Contract Accounts Receivable and Payable**, choose > **Convergent Invoicing** > **Integration** > **Enter Specifications for the Transition of Data Storage**. Set a date for '**Start of Transition of Data Storage**'. If '**Start of Transition of Data Storage**' is not empty, and the field '**Start of Processing of Consumption Items in SAP CI**' is not filled, phase 2 is in process. This means that during phase 2 the transaction for manipulating consumption items (CWB) is disabled. Furthermore, no rate triggers and no rerate triggers can be created.
After the Task	Check that the value of the retention period of SAP Convergent Charging (section 9.3) is the same as in the *Customizing* entry '**SAP CC retention period**' in SAP Convergent Invoicing. This number of days determines the period before an activation of data storage is possible (phase 3).

9 Procedure - Phase 3

You must execute this phase when SAP Convergent Invoicing contains enough consumption items to execute its rerating process. The number of consumption items is enough after the complete retention period of chargeable items in SAP Convergent Charging. This is necessary to prevent a rerating operation while more snapshots than consumption items exist in the system.

After this phase, you will be able to execute and use all the new features related to the consumption items of SAP Convergent Invoicing, including the high-volume rerating process.

9.1 Checklist of Phase 3

Before starting phase 3, be sure that SAP Convergent Invoicing holds enough consumption items to execute the rerating process.

9.2 Steps of Phase 3

9.2.1 Step 9 - SAP CC

SAP Convergent Charging executes this step.

Start the Charging\Recharging Web Service	
When	Before step 10 **Note**: Because this step requires restarting the instances, it is strongly recommended to execute this step when the workload of the instances is the lowest.
Who	Administrator
How	Setup Tool
Before the Task	N/A
Task	The goal of this step is to publish the Web service for charging and recharging chargeable items.
Step	**1**. Export the instance map to a file. **a)** Execute the command:

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Start the Charging\Recharging Web Service	

	`setup instancemap export ./instancemap.csv`
	b) Enter your login and your password at the prompt.
	Note: Check on the console that the export is successful and that the file '**instancemap.csv**' exists.
	2. Modify the instance map to enable the Web Service on the dispatcher.
	a) Open the file '**instancemap.csv**' in a text editor.
	b) In all the lines that include the column '**InstanceId'** starting with '**dispatcher**', set the value of the column '**WSHost**' and '**WSPort**' respectively with the address of the corresponding dispatcher and the port where you want to publish the web service. The addresses must be visible from SAP Convergent Invoicing.
	3. Import the updated instance map.
	a) Execute the command:
	`setup instancemap import ./instancemap.csv -clean`
	b) Enter your login and your password at the prompt.
	Note: Check on the console that the export is successful.
	4. Apply the configuration by restarting the dispatcher instances of the SAP CC system.

After the Task	N/A

9.2.2 Step 10 - SAP CI

SAP Convergent Invoicing executes this step.

Create an SAP CC Logical Port for the Web Service Consumer Proxy	
When	After step 9
Who	SAP Convergent Invoicing
How	SAP GUI, transaction SOAMANAGER
Before the Task	The relevant Web service consumer proxy must be up-to-date
Task	Enable SAP Convergent Invoicing to consume the *Web Services* of SAP Convergent Charging. The already updated consumer proxy for the relevant Web service operation needs a logical port. Create a logical port for your Web service proxy according to the procedure described in the section *Setting Up Communication with SAP Convergent Charging using Web Services* of the Integration Guide for the Offer-to-Cash End-to-End Process Based on SAP Billing and Revenue Innovation Management.
Step	N/A

Create an SAP CC Logical Port for the Web Service Consumer Proxy	
After the Task	Any Web service operation of this Web service must be usable.

9.2.3 Step 11 - SAP CI

SAP Convergent Invoicing executes this step.

Customizing for Phase 3	
When	After step 10
Who	SAP Convergent Invoicing
How	SAP GUI > SPRO > IMG
Before the Task	Check that the CDR retention period is over.
Task	Enable phase 3 by entering a '**Data Storage Active Date**' in *Customizing* in SAP Convergent Invoicing.
Step	After the transition phase is successful, go to *Customizing* for **Contract Accounts Receivable and Payable** and choose **Convergent Invoicing** > **Integration** > **Enter Specifications for the Transition of Data Storage**. Set a date for '**Start of Processing of Consumption Items in SAP CI**'. If the date in '**Start of Transition of Data Storage**' is older than or equal to the current system date, the field '**Start of Processing of Consumption Items in SAP CI**' can be changed. If the checks are successful, this means the transition phase is finished and phase 3 is in process. Furthermore, during phase 3, the transaction for manipulating consumption items (CWB) works, and the rate and rerate triggers can be created.
After the Task	Check that the rate and rerate triggers are created. Check that the transaction for manipulating consumption items (CWB) works.

9.2.4 Step 12 - SAP CC

SAP Convergent Charging executes this step.

Enable SAP CC to support the rerating process of SAP CI	
When	Just after step 11 has been successfully executed.

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Enable SAP CC to support the rerating process of SAP CI	
	Note: Because this step requires restarting the instances, we strongly recommend that you perform this step when the workload of the SAP Convergent Charging system is the lowest.
Who	Administrator
How	Config Tool
Before the Task	N/A
Task	After this step, SAP Convergent Charging sends rerating requests to SAP Convergent Invoicing but no longer to BART Server (in SAP Convergent Charging). After this step is successful, it will not be possible to undo the modification and enable rerating by BART again without major issues.

Step	**1**. If the Admin+ user interface is not yet connected to a dispatcher instance of the SAP CC system, connect Admin+ with the dispatcher by following the steps defined in section 9.1.
	2. Configure SAP Convergent Charging so that it can delegate the rerating process to SAP Convergent Invoicing.
	a) Execute the command:
	`set EIF_EXTERNAL_SYSTEM_CODE_RERATING CI persistent`
	Note: Check that the value of the **EIF_EXTERNAL_SYSTEM_CODE_RERATING** now has a persistent value '**CI**' as shown in the following snapshot:
	`Received from updater#1`
	`- NAME: EIF_EXTERNAL_SYSTEM_CODE_RERATING (PERSISTENT, updater)`
	`- ACCESS: read-write (DB)`
	`- DEFAULT VALUE: None`
	`- PERSISTENT VALUE: CI`
	3. Apply the configuration:
	o Restart the updater instances of the SAP CC system.
	o If some instances of the Core Tool are running, they must be restarted to take the configuration change into account.

After the Task	N/A

9.2.5 Step 13 - SAP CC

SAP Convergent Charging executes this step.

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Customizing for Phase 3	
When	After step 12
Who	SAP Convergent Charging
How	Database
Before the Task	Determine the retention period for the CDRs stored by BART Server: • The retention period for CDRs must be between 40 and 180 days • The retention period for CDRs must be equal to the retention period for counter snapshots in Core Server (see step 14)
Task	The goal of this step is to enable the archiving of CDRs in the BART Server database and to configure the retention period for the CDRs before they are archived.
Step	Refer to the chapter *Configuration of the BART Database* in the SAP CC Configuration Guide.
After the Task	N/A

9.2.6 Step 14 - SAP CC

SAP Convergent Charging executes this step.

Customizing for Phase 3	
When	After step 13
Who	SAP Convergent Charging
How	Setup Tool
Before the Task	Determine the new retention period for the counter snapshots stored by Core Server: • The retention period for the counter snapshots must be between 40 and 180 days • The retention period for the counter snapshots must be equal to the retention period for CDRs in BART Server (see step 13)
Task	The goal of this step is to increase the retention periods for the counter snapshots stored by Core Server for rerating purposes.
Step	**1**. Stop the updater and rater instances of the SAP CC system. **2**. Increase the number of counter snapshots stored for the rerating of charging contracts: **a)** Execute the command with the Setup Tool user interface: `setup migration increaseCounterSnapshotCount <NEW_SNAPSHOT_COUNT>` **b)** Enter your login and your password at the prompt. **Note**: Depending on the number of counter snapshots already present in the Core Server database, the command may take several hours because the existing

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Customizing for Phase 3	
	counter snapshots must be reorganized according to the new retention period. If the operation is stopped before its completion, executing it again will resume it. The operation must be completed before starting the instances; otherwise, the counter snapshots will be in an inconsistent state. **3**. Start the updater and rater instances of the SAP CC system. **Note**: The retention period of consumption items must also be updated to SAP Convergent Invoicing (except if it is already done at installation time).
After the Task	Update the retention period of the consumption items of SAP Convergent Invoicing accordingly.

9.3 Error Management

As described in step 12, it is not possible to move the rerating process back to BART.

10 Additional Information

10.1 Connect Admin+ with a Dispatcher Instance of SAP CC

1. Start Admin+.
2. Identify the address of the host on which the dispatcher you want to connect to is running.

   a) Execute the command:

   `a+ > host dispatcherHostName dispatcherListeningPort`

   Where:

   - `dispatcherHostName`: Is the name of the host machine on which the dispatcher instance is running
   - `dispatcherListeningPort`: Is the port that the HCI server is listening to

   For example, if the dispatcher you want to connect to is listening to the following address: **http://1.2.3.4:9060**, the command must be: `a+ > host 1.2.3.4 9060`
3. Establish the connection with the identified dispatcher by entering the user credential with which you want to be authenticated by the instance.

   a) Execute the command:

   `a+ > user login password`

   Where:

   - `login`: Is the login of an SAP CC user whose role is `admin`
   - `password`: Is the password of the SAP CC user

   b) Check that the Admin+ prompt is changed and now contains the dispatcher instance you are connected to. For example, if the master dispatcher is dispatcher#1, the prompt must be: `[dispatcherHostName]dispatcher#1 >`

   If the prompt is not changed, return to step 2 and check that the specified value is correct.

10.2 Read Version of SAP CC

The version of a running SAP Convergent Charging is an indicator available whatever the instances. For more information about this indicator, see the *System Parameter Reference* of SAP Convergent Charging.

To read the version of a running SAP Convergent Charging system, use the following procedure:

1. If Admin+ is not yet connected to a dispatcher instance, connect Admin+ with the dispatcher by following the steps defined in section 9.1.
2. Get the version of all the instances of SAP Convergent Charging.

   a) Execute the command:

   `a+ > get VERSION`

   Example of results received by rater#1:

   `- NAME: VERSION (MEMORY, rater#1)`

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```
- ACCESS: read-only (INDICATOR)
- MEMORY VALUE: 4.5.0.0
```

Example of results received by dispatcher#1:

```
- NAME: VERSION (MEMORY, dispatcher#1)
- ACCESS: read-only (INDICATOR)
- MEMORY VALUE: 4.5.0.0
```

Note: The versions of all the instances are displayed on the console and are the same ones. The version of the running SAP Convergent Charging is the **MEMORY_VALUE** (4.5.0.0 in the previous snapshot for SAP Convergent Charging 4.0).

10.3 SAP CC Rerating Retention Period

The rerating retention period is in days and corresponds to the number of counter snapshots kept by SAP Convergent Charging.

The number of counter snapshots is defined in SAP Convergent Charging as an administration parameter and is available via Admin+ by executing the following procedure:

1. If Admin+ is not yet connected to a dispatcher instance, connect Admin+ with the dispatcher by following the steps defined in section 9.1.
2. Read the counter snapshot count.

   a) Execute the command:

   ```
   get COUNTER_SNAPSHOT_COUNT persistent updater
   ```

   Note: The next example is a snapshot of the result of the previous command. The counter snapshot count is the persistent value (40 in this example) meaning that the rerating retention period is 40 days.

   Example of results received by updater#1:

   ```
   - NAME: COUNTER_SNAPSHOT_COUNT (PERSISTENT, updater)
   - ACCESS: read-write (DB)
   - DEFAULT VALUE
   - MEMORY VALUE: 40
   ```

10.4 Consumption Item Class Design

This part deals with the design of consumption item classes that can be synchronized with an existing chargeable item class.

This section is based on the following chargeable item class and describes how to design the consumption item class so that it can be synchronized later with this chargeable item class:

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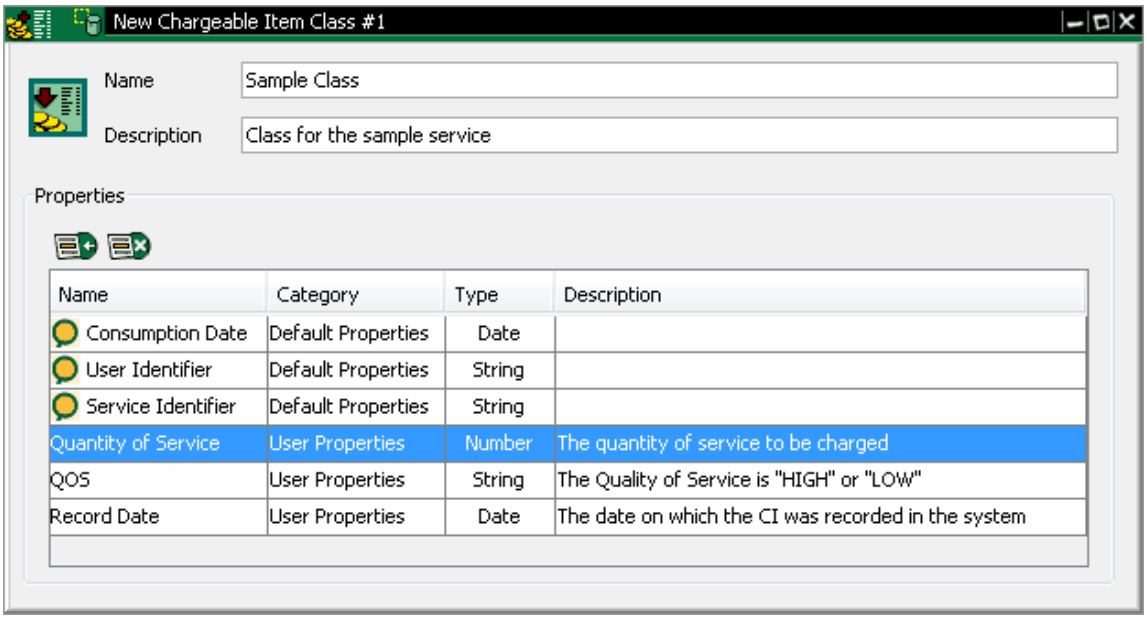


Figure 6: Window of a Chargeable Item Class

10.4.1 Consumption Item Class Field Design

The default fields of a chargeable item class are defined in the basic interface component of a consumption item class as the following fields:

Chargeable Item Class Default Field	Consumption Item Class Basic Interface Component Field
Consumption Date	CONSUMDATE
User Identifier	ACCESS_USERID
Service Identifier	ACCESS_SERVICEID

The user fields of a chargeable item class are the customer fields of a consumption item class.

Create a consumption item class field for each field of the chargeable item class according to the following rules:

- If the name of the chargeable item class field is a valid consumption item class field, keep the same name. A valid consumption item class field may contain up to 16 upper-case alphanumerical characters and underscores (_), and it must start with a letter.
- If the name of the chargeable item class field is not a valid consumption item class field, choose an arbitrary name for the consumption item class field, and then create an entry in the table "**consumption item class field name, chargeable item class field name**".

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10.4.2 Consumption Item Class Identifier and Name Determination

The consumption item class identifier is equivalent to the chargeable item class name. They can be synchronized in two ways as shown in the next figure:

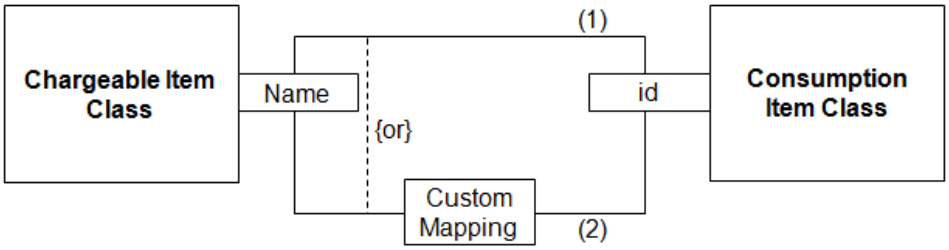


Figure 7: Synchronization between Chargeable and Consumption Item Classes

Note: A valid consumption item class identifier must have exactly 4 upper-case alphanumerical characters and must not start with a number (only numerals and Latin alphabet are allowed).

According to *Figure 7*:

- (1) The name of the chargeable item class is the valid identifier of a consumption item class; in this case, the name of a consumption item class is similar to the name of the chargeable item class.
- (2) The name of a chargeable item class is not the valid identifier of a consumption item class; in this case, the consumption item identifier is an arbitrary identifier. The name of a chargeable item class and the identifier of a consumption item class are synchronized via the custom mapping.
  For example, the chargeable item class “Sample Class” is not a valid consumption item class identifier. The consumption item class identifier will be arbitrarily named “ZSMP”. A custom mapping is required to link ‘Sample Class’ with ‘ZSMP’.

The consumption item class has also a name. The name of the consumption item class can be:

- The name of the chargeable item class if it is not already the identifier of the consumption item class
- The description of the chargeable item class if it exists
- An arbitrary name

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