Enhancement for Warehouse Billing
SAP Extended Warehouse Management
## Document History

<table>
<thead>
<tr>
<th>Document Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>First official release of this guide</td>
</tr>
</tbody>
</table>
Table of Content

1 Getting Started .................................................................................................................. 5
  1.1 About this Guide ........................................................................................................... 5
  1.2 Related Document ....................................................................................................... 5
  1.3 Important SAP Notes .................................................................................................. 5

2 Overview ............................................................................................................................ 6
  2.1 Introduction to Enhancing Warehouse Billing .......................................................... 6
  2.2 Overall Architecture of Warehouse Billing .............................................................. 6

3 Contract Engine Enhancement .......................................................................................... 8

4 Snapshot Enhancement ..................................................................................................... 10
  4.1 Enhancing Snapshot by Introducing New Fields ....................................................... 10
    4.1.1 Step 1: Get Snapshot Table .................................................................................. 10
    4.1.2 Step 2: Add New Fields into Snapshot Table ...................................................... 10
    4.1.3 Step 3: Add Logic for New Field .......................................................................... 11
  4.2 New Snapshot Entity .................................................................................................... 11
    4.2.1 Step 1: Create a new snapshot table ..................................................................... 11
    4.2.2 Step 2: Create a new PoS table (Optional) ............................................................ 11
    4.2.3 Step 3: Create new function module for snapshot logic ..................................... 12
    4.2.4 Step 4: Create new snapshot creation program (optional) .................................. 12
    4.2.5 Step 5: Add configuration for snapshot definition ............................................ 12
    4.2.6 Step 6: Activate Snapshot Entity for Specified Warehouse ............................... 13
  4.3 New Snapshot Entity without Snapshot Logic ............................................................ 13
    4.3.1 Step 1: Create a new PoS table (Optional) ............................................................ 13
    4.3.2 Step 2: Add Configuration for Snapshot Definition ........................................... 14

5 Billing Measurement Service Enhancement ...................................................................... 15
  5.1 Creating New Billing Measurement Service ............................................................. 15
    5.1.1 Step1: Create a New Function Group ................................................................. 15
    5.1.2 Step2: Create a New Variant Selection Screen .................................................... 15
    5.1.3 Step3: Copy and Overwrite Function Module ..................................................... 16
    5.1.4 Step4: Add Configuration for Billing Measurement Services ............................ 17

6 PoS Enhancement .............................................................................................................. 18
  6.1.1 Step 1: Get Proof of Service Table ......................................................................... 18
  6.1.2 Step 2: Add New Fields into Proof of Service Table .......................................... 18
  6.1.3 Step 3: Add Logic for New Field .......................................................................... 18

7 BAdI Introduction ................................................................................................................. 19
  7.1 Enhancement Spot /SCWM/ES_WB_CORE ............................................................... 19
    7.1.1 BAdI /SCWM/EX_WB_CE_COMM ................................................................. 19
    7.1.2 BAdI /SCWM/EX_WB_SNAPSHOT ............................................................... 19
    7.1.3 BAdI /SCWM/EX_WB_POE .......................................................................... 19
    7.1.4 BAdI /SCWM/EX_WB_BM_ARCH ................................................................. 20
  7.2 Enhancement Spot /SCWM/ES_WB_BIF_TM_WEBSRV ......................................... 20
    7.2.1 BAdI /SCWM/EX_WB_BIF_FSOGN_CR ...................................................... 20
    7.2.2 BAdI /SCWM/EX_WB_BIF_FWOGN_CR ...................................................... 20
    7.2.3 BAdI /SCWM/EX_WB_BIF_FRA_RQ ............................................................ 21
    7.2.4 BAdI /SCWM/EX_WB_BIF_FWA_RQ ............................................................ 21

8 Enhancement In TM .......................................................................................................... 22
  8.1 Important BAdI ............................................................................................................. 22
    8.1.1 Invoice Date Determination for Forwarding Settlement .................................... 22
    8.1.2 Invoice Date Determination for Freight Settlement .......................................... 22

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8.2 Settlement Consolidation and Split Strategy.................................................................23
9 Appendix .............................................................................................................................24
9.1 Related Guides ................................................................................................................24
9.2 Related Information .........................................................................................................24
1 Getting Started

1.1 About this Guide

This guide provides detailed introduction on how to enhance the warehouse billing solution on SAP Extended Warehouse Management.

Target Groups
- Technical Consultants
- Solution Consultants
- Support Specialists

1.2 Related Document


1.3 Important SAP Notes

<table>
<thead>
<tr>
<th>SAP Note Number</th>
<th>Title</th>
<th>Comment</th>
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<tbody>
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<td>2147290</td>
<td>Proxy service correction for transfer of forwarding settlement document and freight settlement document</td>
<td>To fix the calculation base code issue in proxy TranportationOrderSUITEInvoicingPreparationRequest_In. As in EhP5 SP09 or EhP6 SP04 or EHP7 SP06, the calculation base code only has 3 chars; but in TM, the calculation base code supports 15 chars.</td>
</tr>
</tbody>
</table>
2 Overview

2.1 Introduction to Enhancing Warehouse Billing

Warehouse Billing enables the following billing and crediting for warehouse service scenarios and functions:

a. Provide warehouse services to your clients and bill clients periodically based on the services provided.
b. Procure warehouse services from external service providers and do self-billing or crediting periodically based on the services received.

The solution is enabled by building blocks in SAP EWM integrating with SAP TM. SAP TM acts as a default contract and billing system that is further integrated with SAP ERP as a financial settlement system. The solution also provides the enhancibility to replace the contract engine and billing system with other legacy system that has the capability of managing contract and billing.

This document mainly focuses on the solution enhancibility relevant to SAP EWM and highly related enhancibility in SAP TM. For more information about general enhancibility of SAP TM and SAP ERP, see the corresponding product documents.

2.2 Overall Architecture of Warehouse Billing

Contract specialists maintain contracts with agreement management in SAP TM. After an agreement has been released, the agreement data is transferred to billing measurement request management in SAP EWM system via web service. EWM experts configure the billing measurement request based on the billing measurement description of agreement with billing measurement service.

There are standard snapshots enabled for billing: inbound, outbound, warehouse task and stock. The snapshot can be scheduled for daily recording of stock and EWM documents that are related for billing. For each snapshot entity, standard billing measurement services are available for assigning measurement of warehouse services based on the snapshotted stock or documents on good quantity, weight, volume or amount of documents.

Based on the snapshot data and billing measurement request configuration, billing measurement document is generated by billing measurement engine. Then billing distribution engine distributes the billing measurement...
document to SAP TM for charge calculation and settlement. In SAP TM, the settlement data is transferred to ECC system for real SD billing or MM invoicing. During this process, if you want to billing by your own logic, you need to enhance the billing measurement engine, snapshot engine and the relevant table structures. In warehouse billing design architecture, the following enhancibilities are provided:

a. Extend new snapshot field for existing snapshot entity
b. Create new snapshot entity
c. Create new billing measurement service
d. Extend proof of service information for existing billing measurement service.
3 Contract Engine Enhancement

In EWM, a central warehouse billing measurement request API is used for receiving contract data to create and update WBMR and WBMS data. For warehouse billing measurement distribution part, a BAdI is provided. In this BAdI the warehouse billing measurement document is sent to contract engine for charge calculation and billing by web service.

Customers can also use ERP or other legacy systems that have contract and billing capability as contract engines instead of SAP TM.

There are 2 parts need to be updated to fulfil this requirement:
Part 1. Measurement related information synchronization and WBMR and WBMS data creation
Part 2. Warehouse billing measurement distribution

For Part 1:
On EWM side, class /SCWM/CL_WB_MEASUREMENT_UPDATE is provided to create or update WBMR and WBMS. You implement your own logic based on this API.

DATA: lo_wb TYPE REF TO /scwm/cl_wb_measurement_update.

CREATE OBJECT lo_wb.

CALL METHOD lo_wb->init.

CALL METHOD lo_wb->update_measurement_info
EXPORTING
  it_bmr_ref = lt_bmr_ref " WBMR reference information
  it_bmr = lt_bmrtab " WBMR information
  it_bmrs = lt_bmrsstab " WBMS information
IMPORTING
  et_bapiret = lt_bapiret.

CALL METHOD lo_wb->save.
Here are more details about the method UPDATE_MEASUREMENT_INFO of class /SCWM/CL_WB_MEASUREMENT_UPDATE.

Class: /SCWM/CL_WB_MEASUREMENT_UPDATE
Method: UPDATE_MEASUREMENT_INFO

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV_VALID_FROM</td>
<td>WBMR validation start datetime</td>
</tr>
<tr>
<td>IV_VALID_TO</td>
<td>WBMR validation end datetime</td>
</tr>
<tr>
<td>IV_LGNUM</td>
<td>Warehouse number</td>
</tr>
<tr>
<td>IV_BMR_ID</td>
<td>WBMR ID</td>
</tr>
<tr>
<td>IT_BMR_REF</td>
<td>WBMR reference information</td>
</tr>
<tr>
<td>IT_BMR</td>
<td>WBMR information</td>
</tr>
<tr>
<td>IT_BMRS</td>
<td>WBMS information</td>
</tr>
<tr>
<td>ET_BAPIRET</td>
<td>WBMR&amp;WBMS creation/update result information</td>
</tr>
</tbody>
</table>

If you want to create or update one or several detailed WBMR and WBMS, only fill parameter IT_BMR_REF, IT_BMR and IT_BMRS.

If you want to update all the WBMRs in one time period, enter parameters like IV_VALID_FROM and IV_VALID_TO. Note that the WBMRs that are not mapped to IT_BMR_REF in this period is deactivated.

For Part 2:
In EWM, one BAdI /SCWM/EX_WB_CE_COMM is provided.
EWM gets the un-distributed WBM information, and this BAdI can be used to send the un-distributed WBM to a contract engine.
The default BAdI implementation is used to send the WBM to TM. But you can create your own implementation based on your requirement.
For more information, see chapter BAdI /SCWM/EX_WB_CE_COMM.
4 Snapshot Enhancement

In EWM the warehouse information is used for warehouse billing measurement. In warehouse billing framework, the warehouse information is copied into specified snapshot tables regularly. And later on, the warehouse billing measurement occurs based on these snapshot tables. Snapshots are needed for the following reasons:

1. Some warehouse information in the warehouse is changing every day. For example, in the standard warehouse tables, you can only get the stock information at the right moment, but you cannot get the stock information for a time period that is important for warehouse billing.

2. The standard warehouse tables have their own archiving rules that can be in conflict with warehouse billing requirements. So it’s better to record the related warehouse information of warehouse billing in warehouse billing tables.

3. Snapshots are needed for performance reason. The warehouse information is recorded in different tables. If you try to get it during the creation phase of warehouse billing measurement, it can be time-consuming. So you can regularly snapshot the information into warehouse billing snapshot tables. And during aggregation, only the snapshot tables are read.

Snapshots in warehouse billing support multiple extensions. The details are as follows.

4.1 Enhancing Snapshot by Introducing New Fields

You can extend the fields of snapshot tables in standard released snapshot entities. If a new field is introduced to the snapshot table, you can extend the snapshot logic and fill this new field.

For example, you can add Goods Value information to the snapshot table of snapshot entity PHYSICAL_STOCK. (Goods Value information is pulled from ERP with the following transaction: Extended Warehouse Management ➔ Physical Inventory ➔ Periodic Processing ➔ Determine and Set Prices from ERP.) You can fulfill this requirement with the following steps.

4.1.1 Step 1: Get Snapshot Table

In EWM IMG you get the snapshot table for snapshot entity PHYSICAL_STOCK.

**IMG path:** SAP Customizing Implementation Guide ➔ SCM Extended Warehouse Management ➔ Extended Warehouse Management ➔ Billing ➔ Define Snapshots.

In the IMG, you can see that the snapshot table for snapshot entity PHYSICAL_STOCK is /SCWM/D_WB_STOCK.

4.1.2 Step 2: Add New Fields into Snapshot Table

Each snapshot table in standard release has one EEW structure. For example, table /SCWM/D_WB_STOCK has EEW structure /SCWM/INCL_EEW_WB_STOCK. You can append a new structure of the field GOODS_VALUE into the EEW structure.
4.1.3 Step 3: Add Logic for New Field

BAdI /SCWM/EX_WB_SNAPSHOT is provided for Snapshot Extension. By default, SAP does not provide any BAdI implementation for this BAdI. If BAdI implementation does not exist, you have to create a new BAdI implementation. Otherwise, extend the existing BAdI implementation. In the BAdI, you can get the snapshot data. You can add API to get GOODS_VALUE for each product and add the information into the snapshot data. For more information about BAdI, see chapter 5.

Note:
The EEW structure of snapshot table is also included into corresponding proof of service (PoS) table of the snapshot entity. And by default the billing measurement services that belongs to this snapshot entity also write the new field information into corresponding PoS during warehouse billing measurement.

4.2 New Snapshot Entity

You can create new snapshot entity with new snapshot table, proof of service table and snapshot logic. The new snapshot entity can also be involved into generic snapshot report and deletion report. For example, you can create a new snapshot entity to snapshot the value-added service information. Follow the steps below to do the extension.

4.2.1 Step 1: Create a new snapshot table

You can create a new snapshot table that is used to record the snapshot data. You must have the following fields included into the new snapshot table:

<table>
<thead>
<tr>
<th>Field</th>
<th>Key</th>
<th>Data Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGNUM</td>
<td>X</td>
<td>/SCWM/LGNUM</td>
<td>Warehouse Number</td>
</tr>
<tr>
<td>ENTITLED</td>
<td>X</td>
<td>/SCWM/DE_ENTITLED</td>
<td>Party Entitled to</td>
</tr>
<tr>
<td>SNAP_TIMESTAMP</td>
<td></td>
<td>/SCWM/WB_SNAP_TIMESTAMP</td>
<td>Snapshot Execution Datetime</td>
</tr>
</tbody>
</table>

4.2.2 Step 2: Create a new PoS table (Optional)

You can create a new PoS table that is used to record the proof of service for warehouse billing measurement. In standard release, in each snapshot entity, all the fields in snapshot table are included into corresponding PoS table. So during warehouse billing measurement all the related information in snapshot table is recorded into PoS table. You do not have to follow this logic and you can only add the fields that you are interested in into the PoS table. You can choose not to define PoS table if you do not need the proof of service functionality for your new snapshot entity.
4.2.3  Step 3: Create new function module for snapshot logic

You must create a new function module that is used to get the snapshot data. This function module is executed by the generic snapshot program /SCWM/WB_SNAPSHOT (T-code /SCWM/WB_SNAP). The program respects the snapshot settings for different warehouse numbers (T-code /SCWM/WB_SNAP_SET).

For more information about snapshot setting like offset day, see details in warehouse billing configuration guide.

4.2.4  Step 4: Create new snapshot creation program (optional)

In standard release, generic snapshot program /SCWM/WB_SNAPSHOT does the snapshot for all the snapshot entities that have defined the snapshot tables and snapshot function modules.

You can create a new snapshot program that only does the snapshot for the specified snapshot entity.

4.2.5  Step 5: Add configuration for snapshot definition

You should add the snapshot entity definition configuration into IMG.


Enter the following information:
1. Snapshot
2. Snapshot Description
3. Snapshot Table
4. PoS Table
5. Snapshot Creation Function Module
6. Snapshot Creation Program.
   If you do not define this, leave this empty
7. Snapshot Deletion Program.
   You can input /SCWM/WB_SNAPSHOT_DELETION as snapshot deletion program. If you have maintained report /SCWM/WB_SNAPSHOT_DELETION, the report deletes the obsolete snapshot data from snapshot entities. You can also create your deletion program and update its report name into this configuration.
   If you do not want to delete snapshot data for new snapshot entity, leave this field empty.
8. Residence Days
   If you have maintained /SCWM/WB_SNAPSHOT_DELETION as snapshot deletion program, this deletion program checks the setting and the snapshot date of snapshot data.
   For example, if you have maintained 100 as residence days and deletion program /SCWM/WB_SNAPSHOT_DELETION, only the snapshot data that is created more than 100 days ago is deleted by this program.
4.2.6  Step 6: Activate Snapshot Entity for Specified Warehouse

Now you have defined new snapshot entity. The snapshot entity does not start to work until you have activated it for specified warehouses.
You can activate the snapshot in SAP Easy Access under SAP Menu ➔ SCM Extended Warehouse Management ➔ Extended Warehouse Management ➔ Settings ➔ Billing ➔ Settings for Snapshots.

4.2.7  Step 7: Add Warehouse Monitor Node for the new Snapshot Entity (Optional)

You can add a monitor node for the new snapshot entity under warehouse monitor node ‘Snapshot’ (Node ID: WB00000001).
You should create a table type and a structure type for output list. The structure type should contain all fields you want to display in the monitor.
You need to create a function module to select snapshot data and display data in the monitor.
Then you should add monitor node configuration into IMG.
Detailed steps, please refer to Chapter 6 of How to Add Application Content to the Warehouse Management Monitor.

4.2.8  Step 8: Add Warehouse Monitor Node for the new PoS Table (Optional)

You can add a monitor node for the new PoS under warehouse monitor node ‘Billing Measurement Item’ (Node ID: WB00000005).
You should create a table type and a structure type for output list. The structure type should contain all fields you want to display in the monitor.
You need to create a function module to select PoS data and display data in the monitor.
Then you should add monitor node configuration into IMG.
Detailed steps, please refer to Chapter 6 of How to Add Application Content to the Warehouse Management Monitor.

4.3  New Snapshot Entity without Snapshot Logic

If you want to define a new snapshot entity, but you do not want to enable the snapshot functionality for this snapshot entity, during warehouse billing measurement, you directly get data from other databases to calculate the key figures.

4.3.1  Step 1: Create a new PoS table (Optional)

You can create a new PoS table that is used to record the proof of service for warehouse billing measurement.
If you do not need the PoS functionality for your snapshot entity, skip this step.
4.3.2 Step 2: Add Configuration for Snapshot Definition

You can add the snapshot entity definition configuration into IMG.
Enter the following information:
1. Snapshot
2. Snapshot Description
3. PoS Table
   If you did not define this table, leave it empty.

4.3.3 Step 3: Add warehouse Monitor Node for the new PoS Table (Optional)

Please refer to 4.2.8 Step8: Add Warehouse Monitor Node for the new PoS Table (Optional).
5 Billing Measurement Service Enhancement

Billing measurement service is a query service based on snapshot data to quantify the warehouse services. You can assign related billing measurement services and variants for WBMR items before generating billing measurement. In warehouse billing, standard billing measurement services are provided to cover most business cases. Furthermore, the extendibility of billing measurement services is provided for some specific requests.

5.1 Creating New Billing Measurement Service

You can create a new billing measurement service for specific requests. You can create new variant selection screens and new rules to process snapshot data. The billing measurement services link to a snapshot entity (both standard snapshot entity and customer enhanced snapshot entity).

For example, you can create a new billing measurement service to calculate goods value of products in stock. For more information about snapshot enhancement for goods value of products, see 4.1 Enhance Snapshot Introducing New Field.

5.1.1 Step1: Create a New Function Group

To create a new function group, include the following subroutine pools in master program.

```
INCLUDE /SCWM/LWB_BMS_BASICF01.
INCLUDE /SCWM/LWB_BMS_BASICS01.
```

Then, add the following code in system defined include-file "XXXXTOP".

```
INCLUDE /SCWM/LWB_BMS_BASICSCR.
```

5.1.2 Step2: Create a New Variant Selection Screen

In the include-file "XXXXTOP", create a selection screen with the needed selection parameters.

The structure is as follows:

```
SELECTION-SCREEN BEGIN OF SCREEN XXXX AS WINDOW.
**Parameters for the selection-screen**
SELECTION-SCREEN END OF SCREEN XXXX.
```
5.1.3 Step 3: Copy and Overwrite Function Module

Function module “/SCWM/WB_BMS_BASIC_SELSCR” is used to show variant selection screens when experts assign billing measurement services and variants in the warehouse monitor. Copy it into function group created in Step 1 and do not make any changes in this function module.

Function module “/SCWM/WB_BMS_BASIC_MEASURE” is used to measure warehouse services according to variants and specific measurement rules. Copy it into function group in Step 1. Overwrite the function module according to the following structure.

A. Prepare where clauses

```
CREATE OBJECT lo_bms.
CALL METHOD lo_bms->initial
  ...
  ...
  BLOCK 1
  ...
  ...
  CLEAR ls_mapping.
  ls_mapping-tablename = lv_snapshot-snapshot_tab.
  ls_mapping-selname = ",
  ls_mapping-fieldname = ".
  APPEND ls_mapping TO lt_mapping.
  ...
  ...
  BLOCK 2
  ...
  ...
  CALL METHOD lo_bms->get_range
  CALL FUNCTION 'FREE_SELECTIONS_RANGE_2_WHERE'
  ...
  ...
```

Object lo_bms is reference to class /scwm/cl_wb_bms_basic that provides some methods during billing measurement generation.

Method lo_bms->initial is used to initialize some basic data for where-clause preparation.

In BLOCK 1, you can use method lo_bms->add_variant_value to add more variant value. You can use method lo_bms->get_variant_value to handle all the variant value. You can use method lo_bms->set_variant_value to pass the value.

Then, in BLOCK 2 you have to create mappings between field names in database and in the screen. Selname is name in screen and fieldname is the name in database. Furthermore, you have to specify which date in database to be used for measurement.

Method lo_bms->get_range is used to generate range table.

Function FREE_SELECTIONS_RANGE_2_WHERE is used to generate where clauses.

B. Query data

```
OPEN CURSOR WITH HOLD lv_cursor FOR
SELECT * FROM (lv_snapshot-snapshot_tab)
WHERE (ls_wherecl-where_tab).
FETCH NEXT CURSOR lv_cursor
  INTO CORRESPONDING FIELDS OF TABLE <ft_data>
PACKAGE SIZE lv_package_size.
```

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You can use cursor to query data into package instead of getting all the data into memory. Otherwise, if there is mass data in the database, memory problem occurs. "lv_snapshot-snapshot_tab" is the table name for data query configured in IMG node. You can also specify other tables here.

<ft_data> is an internal table to store data and is defined as weak data typing. If you want to use strong data typing, add data definition at the beginning of this function module.

C. Measure data
You can add some rules to process queried data. You can add some logic to deal with repeated data because of use of data package. For example, there is an inbound delivery with ten items and you need to measure number of inbound deliveries. But this inbound delivery is split into two packages and it can be counted twice.

D. Write proof of service
After data measured, proof of service needs to be written and method lo_bms->write_pos is provided. Activate all the objects you have created.

5.1.4 Step4: Add Configuration for Billing Measurement Services

After activating all the objects, you have to add configuration in IMG node.


<table>
<thead>
<tr>
<th>Filed name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMS</td>
<td>A 4-character ID for new BMS</td>
</tr>
<tr>
<td>Function Module for Query</td>
<td>Function module copied from the template in 4.1.3 for measurement</td>
</tr>
<tr>
<td>Function Module for Selection Screen</td>
<td>Function module copied from the template in 4.1.3 for selection screen.</td>
</tr>
<tr>
<td>Report ID</td>
<td>Master program name of function group created in 4.1.1</td>
</tr>
<tr>
<td>Sel Scr</td>
<td>Selection screen ID created in 4.1.2</td>
</tr>
<tr>
<td>Description</td>
<td>Description for new created billing measurement service</td>
</tr>
<tr>
<td>Snapshot</td>
<td>Snapshot entity that the new BMS is mapped to</td>
</tr>
</tbody>
</table>
6 PoS Enhancement

In standard released snapshot entity, all the fields of snapshot table are included into corresponding PoS table of this snapshot entity. But you can also add more information into PoS table. For example, for snapshot entity PHYSICAL_STOCK, if you want to record the business system group information of stock into PoS table, you can add 'Business System Group' information into the PoS table for snapshot entity PHYSICAL_STOCK.
You can fulfill this requirement with the following steps.

6.1.1 Step 1: Get Proof of Service Table

In EWM IMG, you should get the PoS table for snapshot entity PHYSICAL_STOCK.
In the IMG, you can see that the PoS table for snapshot entity PHYSICAL_STOCK is /SCWM/D_STO_P.

6.1.2 Step 2: Add New Fields into Proof of Service Table

Each PoS table in standard release has one EEW structure. For example, table /SCWM/D_STO_P has included EEW structure /SCWM/INCL_EEW_WB_STOCK_POS.
You can append a new structure of the field BUS_SYS_GRP into the EEW structure.

6.1.3 Step 3: Add Logic for New Field

BAdI /SCWM/EX_WB_POE is provided for PoS Extension.
By default, SAP does not provide any BAdI implementation for this BAdI.
If BAdI implementation does not exist, you need to create a new BAdI implementation. Otherwise, you need to extend the existing BAdI implementation.
In this BAdI, you can get the PoS data. You can add API to get BUS_SYS_GRP for each warehouse billing measurement item, and add this information into the snapshot data.
For more information about this BAdI, see chapter 7.
7 BAAdI Introduction

7.1 Enhancement Spot /SCWM/ES_WB_CORE

7.1.1 BAAdI /SCWM/EX_WB_CE_COMM

This BAAdI is used to send the undistributed warehouse billing measurements to corresponding contract engines. In standard release, TM is used as a contract engine. And this BAAdI has one default implementation that sends the undistributed WBM to TM via web service.

You can create a new BAAdI implementation instead of default implementation. And in the new BAAdI implementation, you can deal with the undistributed WBM as you want, for example, to send the WBM to other systems.

<table>
<thead>
<tr>
<th>BAAdI Interface: /SCWM/IF_EX_WB_CE_COMM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method: SEND_MEASUREMENT_RESULT</td>
</tr>
<tr>
<td>Parameter</td>
</tr>
<tr>
<td>IT_BM_ROOT</td>
</tr>
<tr>
<td>EV_DIST_ERROR</td>
</tr>
<tr>
<td>ET_TEXT</td>
</tr>
</tbody>
</table>

7.1.2 BAAdI /SCWM/EX_WB_SNAPSHOT

In standard warehouse billing, several snapshot entities are released. And each snapshot entity has its own snapshot fields.

You can extend the snapshot fields for each snapshot entity. And for these extended fields, you can implement the data fetching logic in the BAAdI /SCWM/EX_WB_SNAPSHOT.

<table>
<thead>
<tr>
<th>BAAdI Interface: /SCWM/IF_EX_WB_SNAPSHOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method: UPDATE_SNAPSHOT</td>
</tr>
<tr>
<td>Parameter</td>
</tr>
<tr>
<td>IV_SNAPSHOT_ENTITY</td>
</tr>
<tr>
<td>CT_SNAPSHOT</td>
</tr>
</tbody>
</table>

7.1.3 BAAdI /SCWM/EX_WB_POE

In standard warehouse billing, several snapshot entities are released. And each snapshot entity has its own proof of service table.
You can extend the fields of PoS tables. If these new fields are added into corresponding snapshot table of the snapshot entity with the same name, you need not to add additional PoS written logic. But if the new fields in PoS are not added into snapshot table, you can implement the data fetching logic in the BadI /SCWM/EX_WB_POE.

**BAPI Interface: /SCWM/IF_EX_WB_POE**

**Method:** PREPARE_POE_INFO

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV_SNAPSHOT_ENTITY</td>
<td>Snapshot entity</td>
</tr>
<tr>
<td>CT_POE</td>
<td>The PoS data</td>
</tr>
</tbody>
</table>

### 7.1.4 BAdI /SCWM/EX_WB_BM_ARCH

This BAdI is provided for warehouse billing measurement archive extension. By default, SAP does not provide any BAdI implementation for this BAdI. If BAdI implementation does not exist, you need to create a new BAdI implementation. You can use this BAdI to do the following work:
- Archive user-defined PoS tables
- Delete the records from user-defined PoS tables
The name of user defined PoS tables is stored in warehouse billing measurement items.

### 7.2 Enhancement Spot /SCWM/ES_WB_BIF_TM_WEBSRV

In this enhancement spot, there are four BAdIs for TM-EWM integration.

#### 7.2.1 BAdI /SCWM/EX_WB_BIF_FSOGN_CR

This BAdI is provided for service order data mapping extension. By default, SAP does not provide any BAdI implementation for this BAdI. If BAdI implementation does not exist, you need to create a new BAdI implementation. You can use this BAdI to do the following work:
- Process outbound mapping with system settings to create service orders in an external agreement management system.
- Overwrite outbound mapping of the system settings to create a service order in the external agreement management system.

#### 7.2.2 BAdI /SCWM/EX_WB_BIF_FWOGN_CR

This BAdI is provided for forwarding order data mapping extension. By default, SAP does not provide any BAdI implementation for this BAdI. If BAdI implementation does not exist, you need to create a new BAdI implementation. You can use this BAdI to do the following work:
a. Process outbound mapping with system settings to create forwarding orders in an external agreement management system.
b. Overwrite outbound mapping of the system settings to create a forwarding order in the external agreement management system.

7.2.3 BAdI /SCWM/EX_WB_BIF_FRA_RQ

This BAdI is provided for freight agreement data mapping extension. By default, SAP does not provide any BAdl implementation for this BAdl. If BAdl implementation does not exist, you need to create a new BAdl implementation. You can use this BAdl to add information or change the current mapping data when the system creates a request for warehouse billing measurement from the freight agreement information in the agreement management system. The information from the agreement management system is in the form of a process inbound freight agreement message.

7.2.4 BAdI /SCWM/EX_WB_BIF_FWA_RQ

This BAdl is provided for forwarding agreement data mapping extension. By default, SAP does not provide any BAdl implementation for this BAdl. If BAdl implementation does not exist, you need to create a new BAdl implementation. You can use this BAdl to add information or change the current mapping data when the system creates a request for warehouse billing measurement from the forwarding agreement information in the agreement management system. The information from the agreement management system is in the form of a process inbound forwarding agreement message.
8 Enhancement In TM

In this document, only part of directly related enhancement topic are described below. However, all the standard TM enhancements especially those related to agreement management and settlement management are valid for enhancing the warehouse billing solution. For more information, see TM enhancement document.

8.1 Important BAdl

8.1.1 Invoice Date Determination for Forwarding Settlement

This BAdI is used to determine forwarding settlement invoice date. The default implementation is provided. Enhancement spot /SCMTMS/CFIR_DATES  
BAdI /SCMTMS/CFIR_DATES  
Default Implementation /SCMTMS/CFIR_DATES_IMP.  
For warehouse billing, the default implementation is provided. The invoice date is the end of the latest service execution date of forwarding order. By default, the implementation is inactive and needs to be active if you want to use the default logic. You can implement your logic by creating a new implementation.  
There are two methods in this BAdI interface. For the method DETERMINE_ORDER_DATE_FOR_INV, it used to get all dates of forwarding order related. The second method MODIFY_BILLING_DATE is used to modify the invoice date.

BAdI Interface: /SCMTMS/IF_CFIR_INV_DATE

<table>
<thead>
<tr>
<th>Method: DETERMINE_ORDER_DATE_FOR_INV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
</tr>
<tr>
<td>IT_TRQ_ROOT_DATA</td>
</tr>
<tr>
<td>IT_TRQ_STAGE_DATA</td>
</tr>
<tr>
<td>IT_TRQ_DATES</td>
</tr>
<tr>
<td>CT_FWSD_INV_DATES</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method: MODIFY_BILLING_DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
</tr>
<tr>
<td>IT_TRQ_STAGE_DATA</td>
</tr>
<tr>
<td>IT_TRQ_ROOT_DATA</td>
</tr>
<tr>
<td>CT_FWSD_INV_DATES</td>
</tr>
</tbody>
</table>

8.1.2 Invoice Date Determination for Freight Settlement

Enhancement spot /SCMTMS/SFIR_DATES  
BAdI /SCMTMS/SFIR_DATES  
This BAdI is used to determine freight settlement invoice date.
BAdI Interface: /SCMTMS/IF_SFIR_INV_DATE
Method: DETERMINE_INV_DATE

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT_TOR_EXEC_INFO</td>
<td>Combined Execution Information</td>
</tr>
<tr>
<td>IT_TOR_DATES</td>
<td>TOR Dates</td>
</tr>
<tr>
<td>CT_TOR_INV_DATE</td>
<td>Invoice dates for TOR</td>
</tr>
</tbody>
</table>

For EWM warehouse billing, a default implementation /SCMTMS/SFIR_DATES_WB_IMP and implementation class/SCMTMS/CL_SFIR_DATES_WB_IMP are provided.
This implementation selects the latest execution end date of each freight order as freight settlement invoice date.

8.2 Settlement Consolidation and Split Strategy

EWM Warehouse Billing settlement consolidation strategy enables users to consolidate settlements not only by standard conditions but also by billing period.

To do the implementation, two new strategies, corresponding methods and assigning methods are defined for the strategies as follows:

Defining Strategy

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD_C_WB</td>
<td>Creating warehouse billing freight settlement document</td>
<td>TM-INVOICE</td>
</tr>
<tr>
<td>FWSD_C_WB</td>
<td>Creating warehouse billing forwarding settlement</td>
<td>TM-INVOICE</td>
</tr>
</tbody>
</table>

Defining Methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Service</th>
<th>Class</th>
<th>Interface Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD_C_WB</td>
<td>TM_INVOICE</td>
<td>/SCMTMS/CL_SFIR_METHODS_WB</td>
<td>EXECUTE_CONsolidATION_WB</td>
</tr>
<tr>
<td>FWSD_CS_WB</td>
<td>TM_INVOICE</td>
<td>/SCMTMS/CL_CFIR_METHODS_WB</td>
<td>EXECUTE_CONsolidATION_WB</td>
</tr>
</tbody>
</table>

Assigning Methods to Strategy

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Method</th>
<th>Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD_C_WB</td>
<td>FSD_CS_WB</td>
<td>1</td>
</tr>
<tr>
<td>FWSD_C_WB</td>
<td>FWSD_CS_WB</td>
<td>1</td>
</tr>
</tbody>
</table>

Assign the strategy to corresponding settlement profiles that forwarding orders or freight orders is used:
Run T-Code SPRO and navigate to Settlement Profile Settings "SAP Customizing Implementation Guide → SAP Transportation Management → Transportation Management → settlement → Define Settlement Profile". Assign the strategy to "Split/Cons." under Settlement Profile Settings section.
9 Appendix

9.1 Related Guides

9.2 Related Information

The following table contains links to information relating to the development Guide.

<table>
<thead>
<tr>
<th>Content</th>
<th>Quick Link to the SAP Service Marketplace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Related SAP Notes</td>
<td><a href="https://css.wdf.sap.corp/sap/support/notes/012003146900000150662015">https://css.wdf.sap.corp/sap/support/notes/012003146900000150662015</a></td>
</tr>
</tbody>
</table>