PUBLIC
2018-08-27

Real-Time Consolidation

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Content

1 Real-Time Consolidation

1.1 Real-Time Consolidation Overview

Real-Time Consolidation (RTC) is a consolidation solution based on the deep integration between SAP S/4HANA and SAP Business Planning and Consolidation (SAP BPC).

RTC takes both data quality and flexibility into account. It has the privileged direct access to universal journal entries, while leveraging the consolidation capabilities from SAP BPC. Unified staging and storage of finance data achieves high data quality and eliminates redundancy.

1.1.1 Features

Real-Time Consolidation in SAP S/4HANA includes the following features:

All Features of SAP Business Planning and Consolidation 10.1, in the Embedded Configuration

Real-Time Consolidation uses features of SAP Business Planning and Consolidation 10.1, in the embedded configuration. It provides data provisioning through SAP BW virtualization technology to avoid data replication. SAP BPC can also write back the consolidated results to the SAP S/4HANA consolidation journal (table ACDOCC).

SAP S/4HANA Data Modeling

This feature enables you to:

- Complete real-time and flexible modeling
- Combine planning data with actual data in one model
- Use consolidation versions for different consolidation purposes under the same model
- Streamline the data integration between G/L Accounting and SAP BPC by generating SAP HANA views
- Integrate with G/L Accounting's multi-currency solution
- Leverage SAP BPC's rule-based consolidation

Document Concept for Consolidation Journal Entries

The document concept for consolidation journal entries is not only helpful in classifying data generated by different consolidation tasks, but also in correlating consolidation journal entries for certain reporting. The document enables you to:

- Group consolidation journal entries by document numbers
- Classify journal entries with posting levels supporting sequential document numbers
- Control posting with customizations using the document type

Currency Translation

Depending on the currency translation mode you choose, you can:

- Define translation methods and rounding methods
- Fully integrate with the local data release process
- Start translation runs for multiple entities in parallel to achieve better performance
- Reuse the translated result in multiple currencies from G/L Accounting
- Assign translation methods at version and entity level
- Use the enhanced detail log for better interpretation of data calculation
- Trace translated amounts back to the local amounts
- Perform translation on different types of source currency amounts
- Complete translation based on investment and equity history amounts in group currency

Data Validation

Data validation ensures the quality of locally reported financial data by enabling you to:

- Validate and correct data at source before it is released to the group
- Define and assign validation rules
- Fully integrate with the data release process to ensure data quality
- Add comments and attachments to the validation result
- Run validation in parallel in SAP HANA for multiple rules to achieve better performance

Data Collection

A data release request can take a snapshot of data in the universal journal and have the timestamp recorded. In this way, data replication is eliminated. Data collection also enables you to:

- Complete the flexible upload of data for external entities
- Have full status (initialization/translation/validation/release/approve/reject/defer) control on data release requests
- Use the embedded financial statement report for data review
- Integrate with currency translation and validation
- Trace and compare the release history
- Run mass operations on data release requests

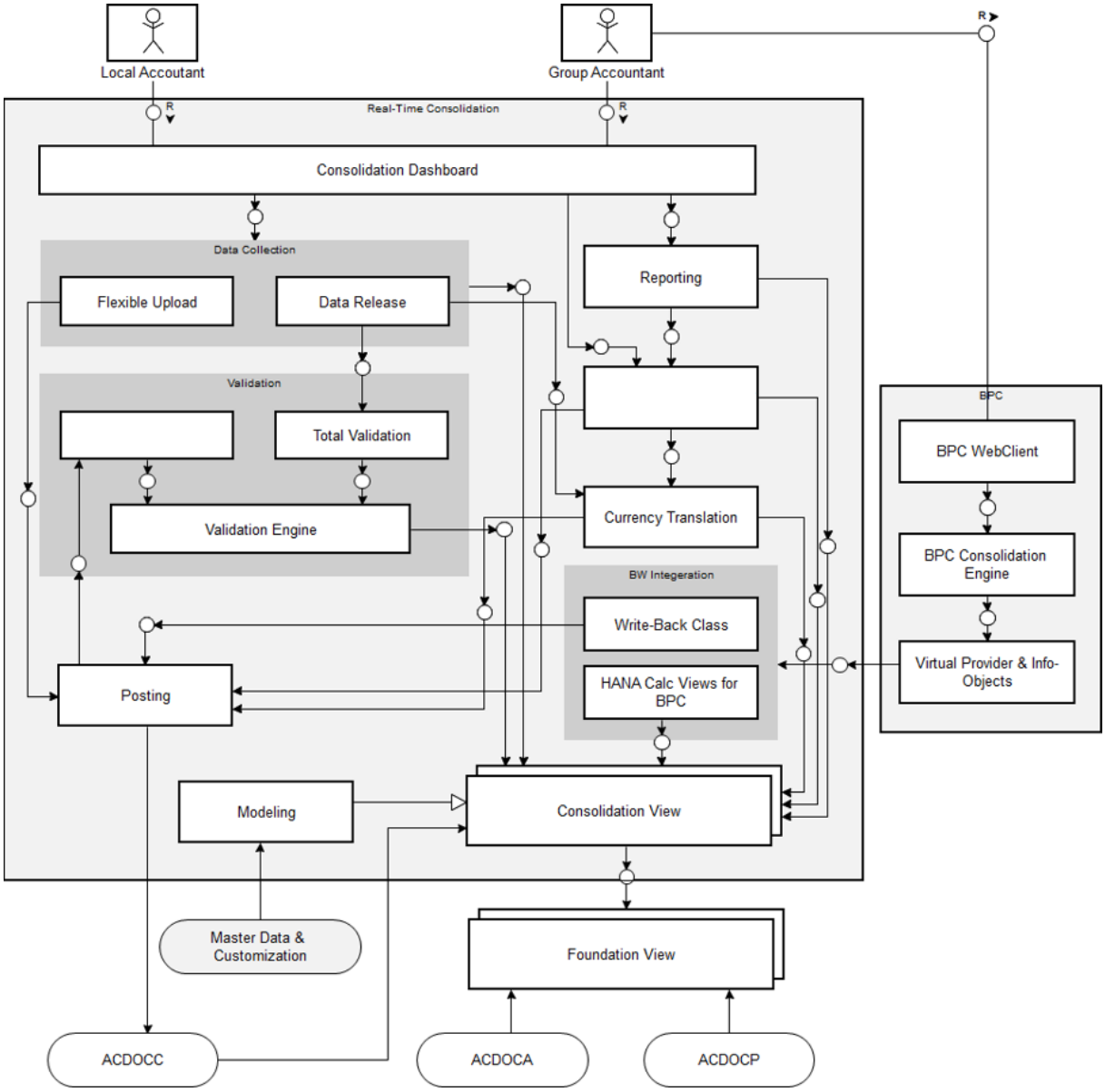
1.1.2 Architecture

Real-Time Consolidation in SAP S/4HANA (RTC) provides consolidation foundations in the context of SAP S/4HANA. It is designed to move most of consolidation financial data preparation activities to the source without data replication, that is local accounting, and eliminate data replication as much as possible. Efficiency and data quality are improved before data enters the consolidation engine of SAP BPC for further processing. The consolidated results can be stored back into the consolidation journal table in SAP S/4HANA (table ACDOCC).

RTC is comprised of the following main components:

- Consolidation Modeling
- Data Collection
- Data Validation
- Currency Translation
- Posting

The detailed architecture is illustrated in the following diagram:



Embedded in SAP S/4HANARTC leverages both SAP HANA's in-memory column-based analytic engine and SAP BPC's rule-based consolidation engine. By provisioning data from the Universal Journal (ACDOCA) directly to the SAP BPC, RTC achieves consolidation on real-time financial data.

The foundation view is an SAP HANA calculation view or CDS view that acts as the foundation for consolidation views to be built on. It is mainly used to project fields from the tables `ACDOCA` or `ACDOCP`. You may also add filters on fields like ledger and company code to ensure the correct dataset is used. You can create foundation views using the SAP HANA Studio.

A consolidation model is defined by assigning foundation views as data sources along with some essential financial master data, such as *Group Chart of Accounts*, *Fiscal Year Variant*, and *Entity Dimension*. Based on these inputs, consolidation views for both SAP BPC (calculation views) and SAP S/4HAHA (CDS views) are generated. Through the consolidation views, you can view the financial data from the group's point of view.

Consolidation views for SAP S/4HANA are CDS views, which have different usages, for example, for currency translation, local data validation, or reporting.

Consolidation views for SAP BPC are SAP HANA calculation views, which can be assigned to an SAP Business Warehouse (BW) VirtualProvider along with an ABAP write-back class. Together with InfoObjects, it forms a BW OLAP schema that allows the SAP BPC consolidation engine to consume data. SAP BPC is therefore able to access in real time both transaction data and master data in S/4HANA Finance.

Financial consolidation is not only about reading data, but also posting data. The posting module implements posting APIs to populate data into the consolidation journal table `ACDOCC`. The posting can be started by SAP BPC write-back, flexible upload, currency translation, and other consolidation tasks.

Besides SAP BPC's currency conversion, RTC provides another currency translation option in S/4HANA Finance. The purpose is to improve the data quality at source, so that the workload can be shared among local and group accountants. Local accountants can now submit their local data in both local currency and group currencies. More data validation work can be done before the data is transferred to the group accountants. The RTC currency translation also brings performance benefits by pushing the currency calculation into *SAP HANA*.

The validation engine is used to control data quality during consolidation. It is integrated with the Fiori app *Consolidation Data Release Cockpit*, which validates the local data before its release to the group side. The validation runs on massive data that are already persisted in the database.

The Fiori app *Consolidation Data Release Cockpit* is introduced by RTC to control the scope of the local data that is released to the group level. Unlike conventional consolidation solutions, RTC does not require data replication to transfer data from local accounting to group accounting. RTC uses a timestamp for data filtering, in other words, the timestamp is recorded as the cut-off time in a data release request. With status control of the data, RTC achieves data collection without data replication.

For external entities not using SAP S/4HANA Finance, they can provide the local data through the program *Flexible Upload*, which uploads data in CSV file format, and posts it into the consolidation journal table `ACDOCC`. The uploaded data also needs data release requests to run currency translation and validation before transferring to the group side.

There are a few standard reports provided for generic usage. Users can also build their own reports based on the SAP BW InfoProviders or consolidation journal table `ACDOCC` directly.

The *SAP Fiori launchpad* is the entry point to all necessary Fiori apps for business users, such as local and group accountants, that have the proper authorizations assigned to them. For more information about business role and catalogs in RTC, see Configuring Authorization Roles [page 10].

1.2 Initial Setup

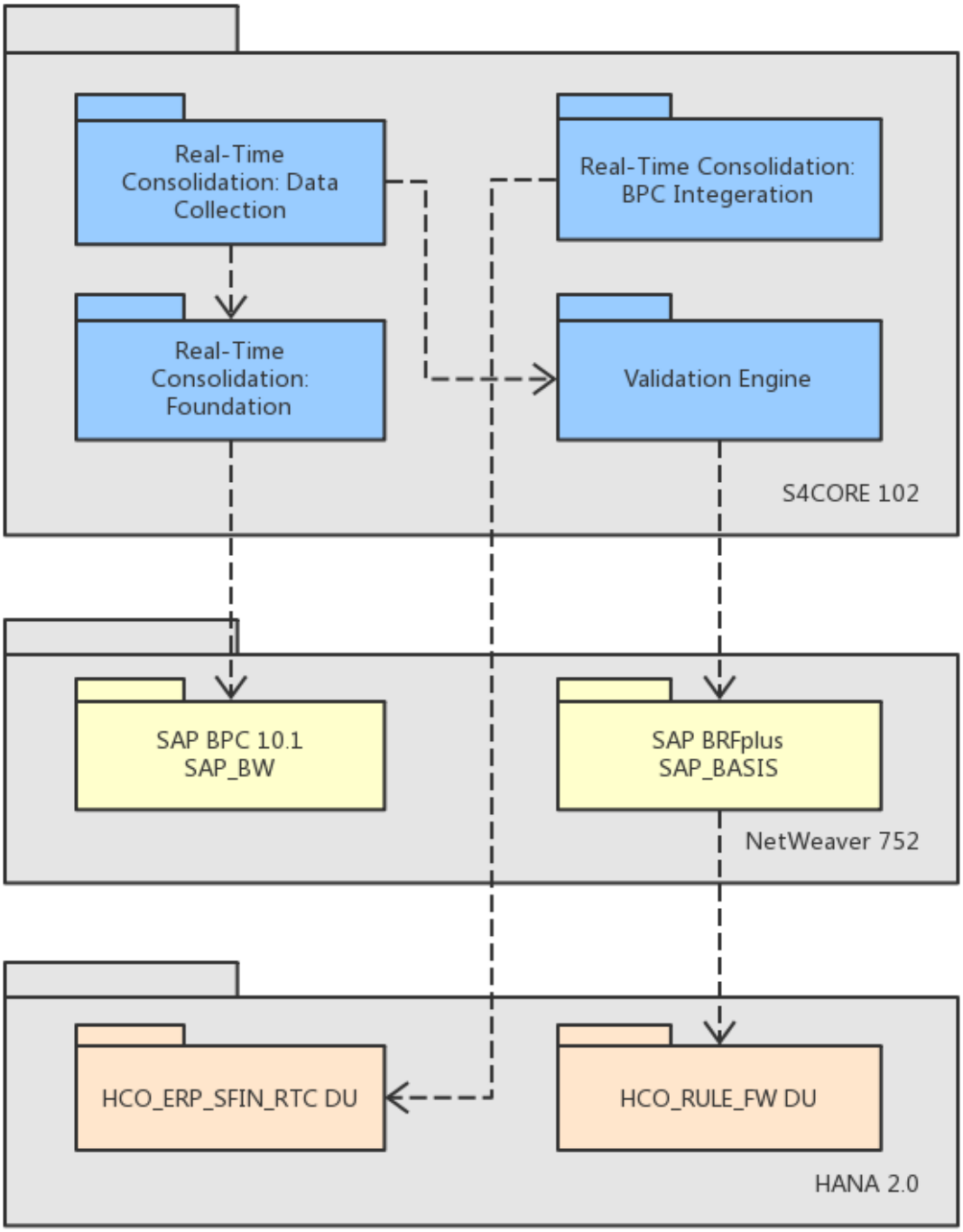
Real-Time Consolidation in S/4HANA (RTC) belongs to the S4CORE software component. SAP Business Planning and Consolidation (SAP BPC) is an embedded version in SAP S/4HANA, so you don't need to install it additionally. In addition, RTC leverages SAP Business Rule Framework plus (BRFplus) for its validation engine, which is also included in SAP S/4HANA.

Apart from SAP BPC and SAP BRFplus, RTC also depends on two SAP HANA delivery units:

- `HCO_ERP_SFIN_RTC`: Contains pre-delivered HANA calculation views for SAP BPC integration.

- `HCO_RULE_FW`: Contains objects from the SAP HANA Rule Framework (HRF), which is used by SAP BRFplus.

The relationships described above are depicted in the following figure:



As shown with the blue blocks in the figure, there are four integral parts in RTC:

- *Consolidation Foundation*: Including modeling, currency translation, and posting.
- *Data Collection*: Comprised of data release cockpit and flexible upload.
- *Validation Engine*: For the validation rule definition.
- *SAP BPC Integration*: For the SAP BW contents and write-back class.

Before you start using RTC, make sure the following prerequisites are met:

Install SAP HANA Studio with the BW Modeling Tools Extension

In order to perform the required configuration and modeling for RTC, you must have SAP HANA Studio installed, with the SAP BW Modeling Tools extension. SAP HANA Studio runs on the **Eclipse** platform and is both a development environment and an administration tool for SAP HANA. You can use SAP HANA Studio to create calculation views for both master data and transaction data.

You must install the SAP BW Modeling Tools, available from within SAP HANA Studio, to create the required SAP BW artifacts such as InfoObjects and CompositeProviders.

- To install SAP HANA Studio, see the `SAP HANA Studio Installation and Update Guide` on SAP Help Portal at https://help.sap.com/HANA_PLATFORM.
- To install the SAP BW Modeling Tools extension, see SAP Note 1954169.
- For the relevant authorization settings, see SAP Note 1969032.

Configure SAP Business Planning and Consolidation 10.1

SAP BPC 10.1 for SAP S/4HANA in an embedded configuration must be set up properly. In order to carry out consolidation tasks, you must install all the InfoObjects and planning function types that are delivered with SAP BPC. For details, see the section `Post-Installation Steps (Embedded only)` in `Installation Guide for SAP BPC 10.1, version for SAP NetWeaver on SAP Business Warehouse 7.50 and for SAP S/4HANA` at https://help.sap.com/bopacnw101.

> **i Note**
>
> The underlying SAP NetWeaver version must be equal to or later than 7.52 SP00.

> **i Note**
>
> For information about setting up system clients for design-time objects of SAP Business Warehouse and SAP BPC, RTC configuration, and SAP S/4HANA business data, see SAP Note 2550172.

Install SAP HANA Rules Framework on SAP HANA XS Classic

SAP HRF provides a set of tools for building rules and decision logic based on the data from your applications. It is used by RTC to verify the local reported financial data before consolidation. You need to install and configure SAP HRF correctly on SAP HANA XS Classic. For more information, see the `SAP HANA Rules Framework on XS Classic - Installation & Upgrade Guide` at http://help.sap.com/hrf10 by selecting the version *1.0 SP11 on XSC*.

Set up SAP Business Rules Framework Plus (BRFplus)

SAP BRFplus is used in RTC for defining and processing data validation rules. It should be installed and configured correctly in the ABAP application server. For information about the setup configuration that is required, see the section `Setup for Working with Analytical Mode` at https://help.sap.com/viewer/nwdsm_brf.

Configure Attachment Services

SAP S/4HANA attachment services is embedded as a reusable component in some RTC Fiori apps. It must be configured correctly on the front-end system and the back-end system. For details, go to SAP Help Portal https://help.sap.com/SAP_S4HANA_ON-PREMISE, select the right product version, choose `Administration Guide for Implementation` under `Additional Information`, and see configuration steps in sections `Setting up SAP S/4HANA attachment services (back-end system)` and `Setting up SAP S/4HANA attachment services (front-end system)`.

After finishing the general configuration steps described above, you need to perform some additional checks and settings specific to RTC. For the step-by-step guide, see SAP Note 2537673.

Install SAP BusinessObjects Analysis for Microsoft Office

SAP BusinessObjects Analysis for Microsoft Office is a Microsoft Office add-in that allows multidimensional analysis of OLAP sources. It can be used for displaying data in consolidation reports. For information on how to install, see SAP Help Portal at https://help.sap.com/boaa and choose *Administrator's Guide*.

Additional Implementation Information

For more information about implementation topics not covered in this documentation, see the following content:

Content	Location
Latest SAP S/4HANA user assistance	https://help.sap.com/s4hana
Related SAP Business Planning and Consolidation information	https://help.sap.com/bopacnw101
Real-Time Consolidation related information	SAP Note2370324

1.2.1 Configuring Authorization Roles

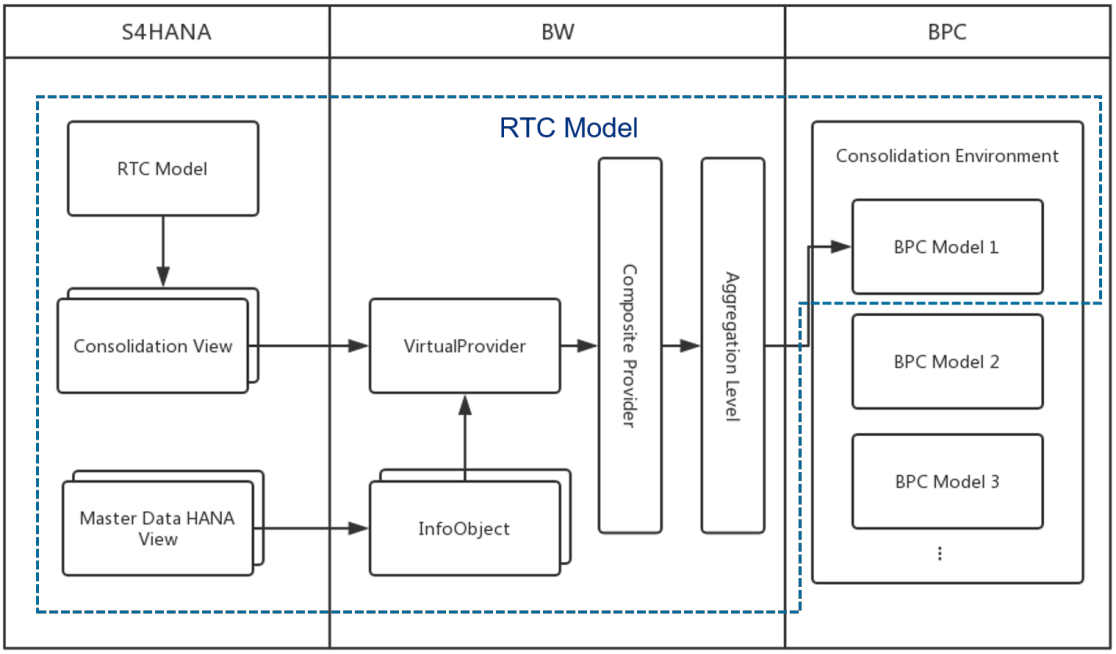
A business role provides users with authorizations to access apps. Business role *SAP_BR_CONSLDTN_SPECIALIST* (consolidation specialist) is pre-delivered for reference. It contains the business catalogs and therefore all authorizations required for the consolidation process. To achieve adequate segregation of duties (SoD), you need to create your own business roles with the appropriate business catalogs assigned, and then assign business roles to users according to their job responsibilities. Below is a complete list of the business catalogs relevant for real-time consolidation.

Business Catalog Name	Description
SAP_FIN_BC_CONS_MASTER_DAT	Prepare chart of accounts, mappings, entities, group hierarchy, and scope definition.

Business Catalog Name	Description
SAP_FIN_BC_CONS_VALIDATION	Define and assign data validation rules.
SAP_FIN_BC_CONS_DATA_REL	Release local financial data to group, including data upload, currency translation, validation, data release, and reverse.
SAP_FIN_BC_CONS_PREPARE	Control fiscal periods for data collection and consolidation, including initializing period, maintaining exchange rates, adjusting scope and group hierarchy, and approving released data.
SAP_FIN_BC_CONS_CONSOLE	Access SAP BPC consolidation monitor, control monitor, and journal posting.
SAP_FIN_BC_CONS_REPORTS	Access financial consolidation reports.

1.3 Configuration of Real-Time Consolidation Model

The Real-Time Consolidation (RTC) model generally works through SAP S/4HANA, SAP BW, and SAP BPC. However, you can define a model that is not integrated with SAP BPC, and then the SAP BW and SAP BPC parts are not needed.



You first create an RTC model (transaction code `RTCMD`) on SAP S/4HANA. A model generates the union consolidation view, which can be assigned to an SAP BW VirtualProvider. In addition, you should also prepare

calculation views for the master data if you want real-time access to the master data in SAP S/4HANA, for example, *G/L Accounts* and *Company*.

The SAP BW is embedded in SAP S/4HANA. You create your SAP BW objects using SAP BW Modeling Tools (Eclipse-based). A VirtualProvider should be created to assign the union view and the write-back class. InfoObjects can be either virtual or physical. A CompositeProvider is optional, however, if you want join other BW cubes (for the legacy data), SAP recommend you create a CompositeProvider. *Aggregation level*, an SAP BW object type used as an InfoProvider for planning, is also required for the planning functions in SAP BPC.

An SAP BPC consolidation model needs to be created in an SAP BPC consolidation environment using SAP BPC's web client. You assign the aggregation level to an SAP BPC model and finish all necessary configurations.

Finally, you assign the SAP BPC consolidation environment and the SAP BPC model back to the RTC model in SAP S/4HANA, and activate it to finish the modeling.

An SAP BPC consolidation environment can contain more than one model, but you can only map one of them to an RTC model.

Refer to the next sections for a detailed procedure on RTC model configuration.

1.3.1 Overall Steps for Model Definition

The following sequence of topics provides an overview of the steps required to define an Real-Time Consolidation (RTC) model.

Create a Consolidation Foundation View

A consolidation foundation view is the foundation for all consolidation views to be generated. You can manually create your foundation view or use the pre-delivered template.

For more information, see Consolidation Foundation Views [page 13].

Prepare Financial Accounting for Consolidation

You must first make any Customizing settings in Financial Accounting that are required for your consolidation. For more information, see Preparing Financial Accounting for Consolidation [page 17].

Define Consolidation Dimensions and Entities

You must define any required dimensions and entities. For more information, see Consolidation Dimension and Entity [page 18].

Define Version-Related Fields (Optional)

Version-related fields are characteristic fields that are combined to form a consolidation version to serve a consolidation purpose and represent a unique and reusable configuration set.

For more information, see Version-Related Fields [page 20].

Set Up the Model

On the SAP S/4HANA side, you must create an RTC model, under which the consolidation foundation view is assigned, and to which the generated consolidation views belong. You can decide whether this model is for SAP BPC integration or not. If the model is not for SAP BPC integration, you can skip the subsequent steps.

For more information, see Model Setup [page 23].

Set Up SAP BW Integration with SAP BPC

You need to prepare SAP BW InfoObjects, a VirtualProvider, a CompositeProvider, and an aggregation level for the BPC integration.

For more information, see Integration with SAP Business Planning and Consolidation [page 30].

Configure SAP BPC

An SAP BPC model must then be created in a consolidation environment using the SAP BPC's web client. You assign the aggregation level to the SAP BPC model and finish all necessary settings.

For more information, see Configuration in SAP Business Planning and Consolidation [page 41].

Finalize and Activate RTC Model

You then return to the RTC modeling tool to assign the SAP BPC environment and model to the SAP S/4HANA model, and activate it.

For more information, see Finalizing and Activating RTC Model [page 38].

1.3.2 Consolidation Foundation Views

Consolidation foundation views are used as the basis for all consolidation tasks in a consolidation model. They can be CDS views or SAP HANA Deployment Infrastructure container views (HDI views) , depending on whether you choose to integrate with SAP BPC. CDS views are created using ABAP Development Tools (ADT), while HDI views are created using SAP Web IDE for SAP HANA. In both cases, you must have SAP HANA Studio (Eclipse-based) installed.

In general, foundation views must achieve the following objectives:

- Project consolidation-relevant fields from the financial journal table
- Make necessary data filtering

As of SAP S/4HANA 1709, SAP delivers the following four foundation views that are categorized to *Actual* and *Plan* data categories. These example foundation views are provided for your reference. You can copy them to your own HDI container (or HDI namespace in the case of CDS views), and adjust them per your own requirements.

Data Category	View Type	View	Description
Actual	CDS	`P_FOUNDATIONA`	Foundation View on ACDOCA
Actual	HDI	`SAPS4H_RT.sap.erp.sfin.rtc::RTC_C_FOUNDATIONA`	Foundation View on ACDOCA
Plan	CDS	`P_FOUNDATIONP`	Foundation View on ACDOCP

Data Category	View Type	View	Description
Plan	HDI	`SAPS4H_RT.sap.erp.sfin.rtc::RTC_C_FOUNDATIONP`	Foundation View on ACDOCP

Fields in the foundation views need to follow a certain protocol, that is, some fields are mandatory or conditionally required, while others are optional. Below table lists the minimum set of fields and their usages.

Field Name	Field Description	Usage
RCLNT	SAP Client	Mandatory
RLDNR	Ledger in G/L Accounting	Mandatory (for drill-through)
GJAHR	Local Fiscal Year	Mandatory (for drill-through)
RBUKRS	Company Code	Mandatory (for drill-through)
BELNR	Accounting Document Number	Mandatory (for drill-through)
RCOMP	Company	Mandatory if consolidation is on company (dimension is set to **100**)
RASSC	Trading Partner	Mandatory if consolidation is on company (dimension is set to **100**)
BUDAT	Posting Date	Mandatory if *Same Fiscal Year Variant* checkbox is not selected for the RTC model
PERIV	Fiscal Year Variant	Mandatory if *Same Fiscal Year Variant* checkbox is selected for the RTC model
POPER	Fiscal Period	Mandatory if *Same Fiscal Year Variant* checkbox is selected for the RTC model
FISCALYEARPER	Fiscal Year Period	Mandatory if *Same Fiscal Year Variant* checkbox is selected for the RTC model
KTOPL	Local Chart of Accounts	Mandatory
RACCT	Local Account Number	Mandatory
RMVCT	Transaction Type	Mandatory
RHCUR	Company Code Currency Key	Mandatory
RKCUR	Global Currency Key	Mandatory if *KSL* is included
HSL	Amount in Company Code Currency	Mandatory

Field Name	Field Description	Usage
KSL	Amount in Global Currency	Mandatory if the currency translation mode is set to *Currency Translation in Accounting* for the RTC model
TIMESTAMP	Timestamp	Mandatory (for data cut-off)
AUDIT_TRA	BPC Audit Trail	Optional (if not given, a fixed value <INPUT> will be added to the generated views for BPC integration)

Optionally, you can add more fields to the foundation views provided that these fields also exist in the consolidation journal (table ACDOCC). The following considerations should be taken into account:

- **Consolidation Dimension**: As shown in the above table, RCOMP and RASSC are mandatory if the consolidation dimension is set to *100 (Company)* in the transaction code RTCCMD (Consolidation Model Dimension). Similarly, the foundation views for other dimensions must also contain the relevant fields configured in RTCCMD. For example, if the dimension is set to *200 (Segment)*, the foundation views must include the SEGMENT and PSEGMENT fields.
- **Data Categories**: In case a model has multiple RTC data categories defined, the foundation views that are assigned to each category must have exactly the same fields, meaning they all have the same number of fields, field sequence, and field names.
- **Group Currency Amount (KSL)**: Group currency amount fields starting with KSL (Amount in Global Currency) and their corresponding currency key fields starting with RKCUR are SAP-reserved field names in the table ACDOCA. If an RTC model has the currency translation mode set to *Currency Translation in Accounting*, these fields will map to the consolidated amount (CONS_SL) and consolidated amount currency (CONS_CUR) fields respectively. You can union them with the local currency data.
  If you want to reuse more currency amount fields from the table ACDOCA, such as OSL (Amount in Freely Defined Currency 1), VSL (Amount in Freely Defined Currency 2), BSL (Amount in Freely Defined Currency 3), and so on, you need to first map them to KSL in your foundation view as shown in the following example:

Source Field	Output Field
KSL	KSL
RKCUR	RKCUR
OSL	KSL1
ROCUR	RKCUR1
BSL	KSL2
RBCUR	RKCUR2

  Make sure **n** in KSL<n> and RKCUR<n> are unique numbers.
  After that, the transaction RTCMD will do the rest, that is mapping KSL<n> to CONS_SL.

> **Note**
>
> If the model is set to *Currency Translation in Consolidation*, the above settings are not relevant.

- **Data Filtering**: To filter data from the universal journal, you must explicitly define the filter in the consolidation foundation view by composing SQL WHERE conditions. For example, you can copy the sample foundation view to your own package and define the filtering on ledgers. If your company is using **`0L`** as the leading ledger, and **`1L`** as the extension ledger, you need to add the following filter condition after the WHERE operator:

> **Sample Code**
>
> ```
> RLDNR = '0L' or RLDNR='1L'
> ```

> **Note**
>
> The ledger is fixed to **`0L`** in SAP-delivered sample foundation views. If you have a different ledger setting in the G/L accounting, you should copy and create your own foundation views, and then change ledgers (`RLDNR`) filtering to those you configured for your business needs.
>
> Ledger is company-dependent, so if each company has different ledger settings, this must also be considered in the above expression.

See Also

For more information on how to create or edit HDI views in SAP Web IDE for SAP HANA, see `SAP Web IDE for SAP HANA Reference` chapter in the `SAP HANA Developer Guide for XS Advanced Model` on SAP Help Portal at https://help.sap.com/HANA_PLATFORM.

1.3.2.1 FS Items Mapping View

Financial statement (FS) items mapping view is used to define the mapping between the local chart of accounts (COA) and the group COA. Currently, it's only supported to map multiple local COAs to one group COA, so the generated mapping view only shows the mapping relations to one group COA.

FS items mapping view is bound to the data stream type *FS Items Mapping* that requires a minimum set of the following field:

Field Name	Label
MANDT	SAP Client
KTOPL	Local Chart of Accounts

Field Name	Label
SAKNR	Local Account Number
KKTPL	Group Chart of Accounts
RACCT	Group Account Number

The predelivered CDS view `P_CONSACCTM` follows the above protocol. It also contains the mapping rules that are defined in G/L Accounting (table `SKA1`). In the BPC integration scenario, a HANA calculation view `RTC_C_CONS_ACCT_M` is predelivered to fulfill the same purpose.

If the existing mapping rules in G/L Accounting cannot meet your requirements, you can compose your own mapping rules and assign your own *FS Items Mapping View* to the stream type.

> **Example**
>
> You want to have *Functional Area* as a condition in addition to the account number, so that you can define the relation that a combination of functional area and local account number maps to group account. In this case, the field `FUNC_AREA` should be added into the mapping view and can be thereafter used as one of the join conditions with the foundation view.

1.3.3 Preparing Financial Accounting for Consolidation

Context

To proceed with the definition of an RTC model, a few preliminary Customizing steps in *Financial Accounting* are necessary.

Procedure

1. Set up the group fiscal year variant and calendar data.
   a. Maintain the required fiscal year variants in Customizing for *Financial Accounting* under *Financial Accounting Global Settings* > *Ledgers* > *Fiscal Year and Posting Periods* > *Maintain Fiscal Year Variant (Shortened Fiscal Year)*.

      Choose one of the fiscal year variants as the group fiscal year variant. When creating the model, you will assign this group fiscal year variant to the model. During runtime, the model can then realign accounting journals from local fiscal periods to group fiscal periods.
   b. Generate fiscal year calendar data for the alignment between local fiscal year variants and group fiscal year variants. You do this in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Consolidation Model Definition* > *Financial Accounting Preparation* > *Generate Fiscal Year Calendar*.

The fiscal calendar data is saved at the day level in table `FINSC_FISC_DATE`, which is then joined with the universal journal (table `ACDOCA`) on the posting date field. Thus, the journal items are realigned to the group fiscal year variant.

2. If your group chart of account is different with operational chart of account, define your group chart of accounts and create a link between the operational chart of accounts and the group chart of accounts in order to allow data from the transaction system to be further processed in consolidation. You do these activities in Customizing for *Financial Accounting* ▸ *Consolidation Preparation* ▸ *General Specifications* ▸ *G/L and FS Charts of Accounts*.

   When creating the consolidation model, you will assign this group chart of accounts to it. During runtime, the operational accounts will be mapped to the group chart of accounts according to the Customizing performed in this step.

3. Maintain the extension of consolidation-specific attributes for G/L accounts in Customizing for *Financial Accounting* under ▸ *Real-Time Consolidation* ▸ *BPC Integration* ▸ *BPC Property Extension Maintenance* ▸ *Extend G/L Account Properties for BPC*.

4. Maintain transaction types for consolidation in Customizing for *Financial Accounting* under ▸ *Real-Time Consolidation* ▸ *BPC Integration* ▸ *BPC Property Extension Maintenance* ▸ *Extend Transaction Type for BPC*.

   > **i Note**
   >
   > Besides the original usage of transaction type to subdivide accounts and do validations before posting, transaction type in RTC is also used to map to flow type in SAP BPC.

5. If you want to run legal consolidation, perform the activities in Customizing for *Financial Accounting* under ▸ *Consolidation Preparation* ▸ *Company Consolidation.*

6. If you want to run management consolidation on profit centers, perform the activities in Customizing for *Financial Accounting* under ▸ *Consolidation Preparation* ▸ *Profit Center: Preparations for Consolidation*. If you want to run consolidation on other business dimensions, such as cost center, business segment, and so on, you can create your own customizations or BAdI enhancements which reference the profit center consolidation and extend or enhance the data required.

1.3.4 Consolidation Dimension and Entity

In Real-Time Consolidation (RTC), entities are made up of fields in the universal journal, usually organizational characteristics such as company code, profit center, and cost center, while dimensions are the meta-definitions of consolidation entities, defining what fields are used for entities and partner entities.

> **i Note**
>
> This entity dimension in RTC is not to be confused with a dimension or its properties in SAP BPC, as they are entirely different concepts.

Dimension

In RTC, a dimension defines which fields in the universal journal (table ACDOCA) and the consolidation journal (table ACDOCC) are used as consolidation entities. For example, dimension 100 (Company) is defined to use field RCOMP (Company) as the entity, and field RASSC (Trading Partner) as the partner entity. During runtime, consolidation procedures use this meta-definition and perform aggregations and eliminations on these two defined fields.

> **i Note**
>
> If a dimension defines the company or company code, then the local currency of an entity defined under that dimension can be automatically determined from the local currency defined in the master data of the company or company code. If a dimension does not define the company or company code, then, for entities under that dimension, the local currency must be maintained manually when defining the entity master data.

You can combine multiple fields in the universal journal and consolidation journal to form an entity. For example, dimension 500 is defined to use a combination of the following three fields: *Controlling Area*, *Company Code*, and *Cost Center*.

SAP delivers the following default dimensions:

Dimension	Description	Assignment Fields	Partner Assignment Fields
100	Company	RCOMP	RASSC
200	Segment	SEGMENT	PSEGMENT
500	Cost Center	KOKRS, RCNTR, RBUKRS	KOKRS, SCNTR, PBUKRS
600	Controlling Area and Profit Center	KOKRS, PRCTR	KOKRS, PPRCTR

You can define your own dimensions in your customer namespace (starting with Y, Z or 9). Ensure the fields you input exist in both tables ACDOCA and ACDOCC.

Define consolidation dimensions in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Consolidation Model Definition* > *Define Consolidation Dimensions*. Alternatively, use transaction code RTCCMD.

Entity

A consolidation entity is the smallest element in a corporate group structure that can be used as a basis for complete consolidation.

Consolidation entities can be such things as companies, business areas, or profit centers. Internal accounting transactions that are to be eliminated by consolidation are processed between entities. In an accounting transaction, an entity can be the triggering entity or the partner entity. In the universal journal (table ACDOCA)

and the consolidation journal (table ACDOCC), there is an include structure, ACDOC_SI_GL_ACCAS, in which the fields are constantly used as consolidation entities.

Method assignment, for example, for currency translation, rounding, and validation, can be made at the entity level, as well as at the default ledger level. For more information, see Currency Translation [page 48].

In RTC, instead of creating a new type of master data for consolidation entities, existing SAP S/4HANA master data is reused as much as possible. However, some properties have to be extended for the purposes of consolidation. Thus, a new relationship table RTC_ENTITY_M is introduced which maps the consolidation entities to the existing financial master data, and stores additional consolidation-related properties.

The relationship table RTC_ENTITY_M can be filled automatically or manually with entities.

You generate entities automatically using the procedure described in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Consolidation Model Definition* > *Consolidation Entity Creation* > *Generate Consolidation Entities Automatically*. This Customizing activity describes how to use the *Generate Entities from Consolidation Dimension Definition* report (RTC_AUTO_PUMP_ENTITIES) to generate entities based on the definitions of either of the pre-delivered dimensions 100 or 500 and existing master data.

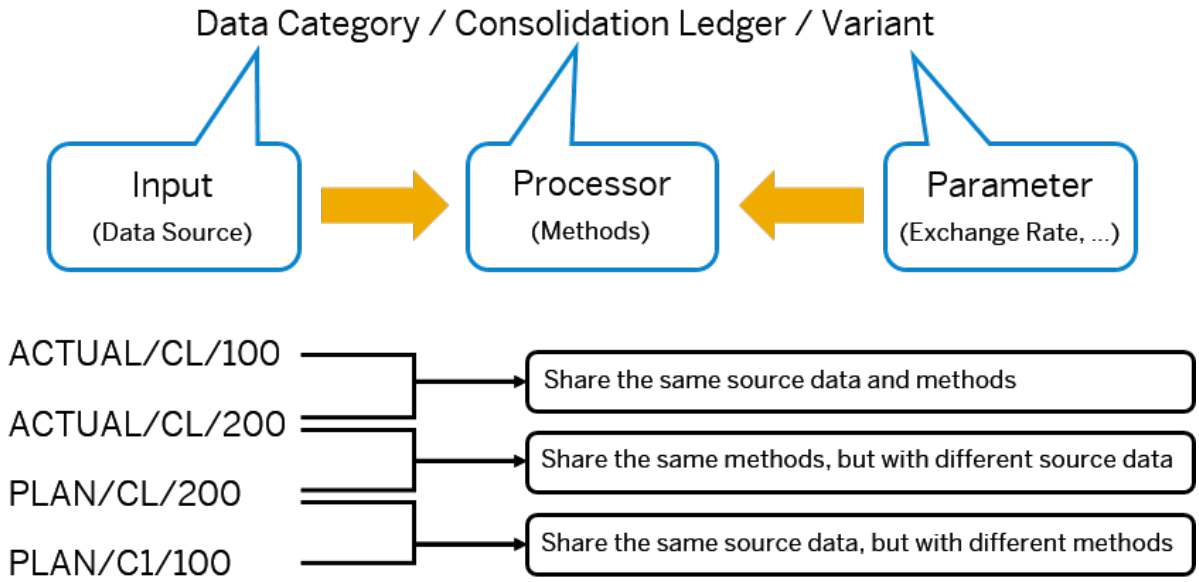
In dimensions such as 500 that are defined by multiple fields, the entity key is a string comprised of each field separated by /.

After the table is filled, you maintain additional consolidation properties for each entity. You can also add or delete entities. You do this in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Consolidation Model Definition* > *Consolidation Entity Creation* > *Maintain Consolidation Entities* (or transaction RTCENT). You can also write your own program to fill in the table based on your own master data structure and dimension definition.

1.3.5 Version-Related Fields

In Real-Time Consolidation (RTC), you can execute parallel consolidation runs according to different aspects of financial data by using versions. A version is defined by the combination of three version-related fields: a data category, a consolidation ledger, and a variant. Each version, defined by a particular combination of version-related fields, is mapped to one SAP BPC category.

From a technical perspective, different versions under the same model provide isolation of the consolidation results. This is because they may have differences in, for example, source data, methods, and exchange rates. However, they can still share a lot of common things such as master data, consolidation methods, and even consolidation journal entries. In other words, consolidation versions provide benefits for both isolation and sharing. The following diagram outlines the use of each field.



To define the version, you start with defining a Real-Time Consolidation data category.

Define RTC Data Category

An RTC data category is used to differentiate various data sources. It acts as a source data input for the consolidation processing. Data from the flexible upload activity and additional financial data are classified into data categories. In addition, you can define categories for plan, actual, or simulation data, for example.

You define data categories in the RTC modeling tool (transaction `RTCMD`) under the *Data Source* tab. Make sure the foundation views assigned to different data categories have the same fields.

SAP pre-delivers the following data category templates:

- `Actual`: Contains foundation views (both CDS and HANA calculation views) on table `ACDOCA`.
- `Plan`: Contains foundation views (both CDS and HANA calculation views) on table `ACDOCP`.

You can choose *Copy from Template* to save effort when defining data categories in modeling.

Create Consolidation Ledger

Consolidation ledger is a different concept to accounting ledger. It has the consolidation methods (rules) assigned. For example, you assign different currency translation methods to various ledgers. It acts as a processor that can be shared among different consolidation versions.

You define consolidation ledgers in Customizing for *Financial Accounting* under *Real-time Consolidation* > *Consolidation Model* > *Version-Related Fields Definition* > *Define Consolidation Ledgers*. Alternatively, use transaction code `RTCLM`.

The pre-delivered consolidation ledger `CL` can be used by default.

Create Consolidation Variant

Variant is the third version field, which is designed for further subdividing versions with the same data category and ledger. It can be regarded as input parameters for consolidation processing. Customizations like exchange rate indicators are defined on variants. Besides, there are other attributes assigned to variants, such as data release mode and currency translation options.

1. *Data Release Mode* controls whether data release process is required for the consolidation version. If you choose *Data release is not required*, then the versions contain this variant will not be shown in the *Consolidation Data Release Cockpit*.
2. *Currency Translation Option* controls whether translation is executed before the data release.

You define variants in Customizing for *Financial Accounting* under *Real-time Consolidation* > *Consolidation Model Definition* > *Version-Related Fields Definition* > *Define Variants*. Alternatively, use transaction code `RTCVAR`.

SAP delivers the following default variants ready for use:

Variant	Description
100	Data release with local currency and group currency
200	No data release
300	Data release with local currency

Define BPC Category

In SAP BPC, you use the category dimension to define the groupings in which information is stored in your model. For example, you might have categories for budget, plan, or actual data.

For RTC, the field *BPC Category* is used to map to the category dimension of SAP BPC. You define categories for this mapping in Customizing for *Controlling* under *General Controlling* > *Planning* > *Maintain Category for Planning*.

> **i Note**
>
> RTC shares the Customizing activity for category with Integrated Business Planning for SAP Simple Finance (IBPF).

In the other direction, a *BPC Category* has a 1:1 relationship with a consolidation version, which is a combination of three version-related fields. You define this mapping relationship when setting up the RTC model. For more information, see Model Setup [page 23].

You can also maintain additional required properties for *BPC Category* in Customizing for *Financial Accounting* under *Real-time Consolidation* > *BPC Integration* > *BPC Property Extension Maintenance* > *Extend BPC Category*. Alternatively, enter transaction `RTCBCT`.

> **i Note**
>
> In SAP BPC, in the embedded configuration that is used by RTC, the *Dimension Properties* (used in the standard configuration of SAP BPC) are replaced by SAP BW InfoObject attributes. For more information on these InfoObject attributes, look for *Maintain InfoObject Attributes* in the Application Help of SAP Business Planning and Consolidation available at https://help.sap.com/bopacnw101.

For example, you can create two BPC categories as follows:

BPC Category	*Description*
FINAL	Final Consolidation
PRELIM	Preliminary Consolidation

The *FINAL* category is for the formal month-end consolidation, which needs control of data handover. The *PRELIM* category is for preliminary consolidation that runs at any time for simulation purposes.

1.3.6 Model Setup

Use

In Real-Time Consolidation (RTC), a model is used to bundle all the definitions, customizations, and consolidated results into an integrated consolidation context. It consists of two parts: one on the SAP S/4HANA RTC side, and one on the SAP BPC side. The first step in setting up the overall RTC model is to set up the model in SAP S/4HANA.

You create and maintain your consolidation model on the SAP S/4HANA side in Customizing for *Financial Accounting* under *Real-time Consolidation* > *Consolidation Model Definition* > *Create Consolidation Model*. Alternatively, you can enter the *RTC Modeling Tool* using transaction code RTCMD.

Prerequisites

Before setting up the model, the following prerequisites must be fulfilled.

- You have both the SAP BPC and SAP S/4HANA environments ready and in the same instance.
- You have performed the necessary configuration in previous sections, for example, preparations in financial accounting, the required consolidation foundation view, dimensions, and version-related fields.
- If the model is to be integrated with BPC, you need to make following configuration:
  1. In the *ABAP-MANAGED HDI Containers* (SCTS_AMHC) transaction, create a HANA Deployment Infrastructure (HDI) container for foundation views. Set the container type to *R (Runtime Container)*, and leave the *For generated objects* checkbox unselected. In the *Reference to Containers/Schemas* table, add two references: **SAPS4H_RT** and **SAP_ABAP**. Then activate the container.
  2. In the SCTS_AMHC transaction, create an HDI container for generated consolidation views. Set the container type to *R (Runtime Container)*, and select the *For generated objects* checkbox. In the

Reference to Containers/Schemas table, add three references: **SAPS4H_RT**, **SAP_ABAP**, and your created HDI container in the step 1. Then activate the container.

3. Access ABAP Development Tools (ADT) to create an HDI namespace for the HDI container you created in step 1. This automatically creates a project in SAP Web IDE, so that you can create HDI views within the project in Web IDE. For step-by-step guide, see .

Procedure

The following procedure outlines basic steps to define your consolidation model in SAP S/4HANA. It's supplemented by an in-depth explanation later on.

1. In the *RTC Modeling Tool* transaction (`RTCMD`), create a new model by entering a six-character-long model name and choosing *Create Model*.

   > **i Note**
   >
   > From the initial screen, you can also display or change an existing model, which basically follows the same procedure. A model cannot be deleted once it is activated, but it can be disabled for business use.

2. In the pop-up dialog, specify whether the model is integrated with SAP BPC. If it is for SAP BPC integration, you also need to assign a *Default Flow Type*. The integration option also controls how and which consolidation views are generated later.
3. Enter a description of the model.
4. In *Basic* tab, enter dimension, group chart of accounts, and group fiscal year variant. If all entities and the group share the same chart of accounts and fiscal year variant, select both checkboxes on the right to indicate this.
5. In *Data Source* tab, define RTC data categories. You can also choose the *Copy from Template* button to add data categories from an existing template, such as the templates *Actual* and *Plan*.
6. In *Version* tab, define consolidation versions. Choose the *Add Version* button and define the three version-related fields and a version description. In the SAP BPC integration scenario, you also need to map a BPC category to each consolidation version.
7. In *Consolidation View* tab, generate the relevant consolidation views.
8. Save the model.

The model is in saved status (*S*), and consolidation views are generated that can be used to create SAP BW CompositeProviders and VirtualProviders.

Basic Settings

In *Basic* tab, specify:

- *Dimension*: To determine which field or field combination of organizational characteristics is defined as the consolidation entity and partner entity.

> **Note**
>
> RTC supports matrix consolidation, which allows you to run interunit elimination in two dimensions, for example, and *segment*. For the detailed configuration procedure, see SAP Note 2547695.

- *Group Chart of Accounts*: To map with the operational chart of accounts when building the group financial statements.
- *Group Fiscal Year Variant*: To distribute journal entries into the right group fiscal year and period.

Under the *Integration Option* section of the screen, you can choose the currency translation mode. It controls in which module and phase the currency translation is performed.

1. *Currency Translation in Consolidation*: Currency is translated in consolidation systems such as RTC or SAP BPC during consolidation.
2. *Currency Translation in Accounting*: Currency is translated in the G/L accounting system during document posting or later when re-evaluating currency. With this option, it is possible to reuse multiple group currencies exist in the universal journal (table `ACDOCA`) by mapping relevant fields in your foundation view. For details, see Consolidation Foundation Views [page 13].

> **Note**
>
> Even if *Currency Translation in Accounting* is selected, it is still possible to use consolidation currency translation to re-evaluate the amount.

In the scenario of BPC integration, you need to specify the *HDI Container for Generated Views* and *Namespace for HDI Objects* you created in the Prerequisites [page 23] part of this section.

Once a model is activated, the above mentioned basic settings can no longer be changed.

Data Source

You define consolidation data sources in the *Data Source* tab. Consolidation data sources are grouped by *RTC Data Category*. Each data category contains a full set of source data for consolidation. SAP pre-delivers the following two data category templates, from which you can copy and create your data categories:

Data Category Template	Description
Actual	Actual data in `ACDOCA`
Plan	Plan data in `ACDOCP`

Different types of source data are further differentiated using *Data Stream*. Data streams and the fields contained within them are predefined. The mandatory data streams are *FI Journals* and *FS Items Mapping* (also known group chart of accounts mapping).

You assign each data stream to either an HDI foundation view or a CDS view.

- If the model is set as integrated with SAP BPC, specify the *Logical Container for Foundation Views* and the *Namespace for HDI Objects* you created in the Prerequisites [page 23] part, for each data stream of all data categories.

- If the model is set as not integrated with SAP BPC, the respective CDS views should be assigned.

For more information about defining your own foundation views or FS items mapping views, see Consolidation Foundation Views [page 13] and FS Items Mapping View [page 16].

> **i Note**
>
> To enable drill-through on journal entry item level, a *Source Tag* should be maintained for the *FI Journals* data stream as **A** or **P**, indicating that the source data comes from the table ACDOCA or ACDOCP.

Version

Version is used to run parallel consolidations depending on the selected criteria. You can define multiple versions for a consolidation model. The consolidation results are then isolated by version. In the *Version* tab, you can create consolidation versions by assigning unique value combinations of RTC data category, ledger, and variant.

In the SAP BPC integration scenario, you also need to map a BPC category to each of your version combinations.

For more information, see Version-Related Fields [page 20].

Consolidation Views

Consolidation views are CDS views or HDI views generated by the modeling tool for different consolidation purposes. Based on the foundation views and other meta-definitions, such as chart of accounts, fiscal year variant, and consolidation dimension, the system generates a number of consolidation views, including HDI views to be used by SAP BPC and CDS views to be used by consolidation tasks in SAP S/4HANA.

Consolidation views are generated either by using the *Generate* button, or automatically when a model is activated. Consolidation views are grouped by usage, for example, base view, BPC view, and validation view. The generated views depend on the integration options. Only in the BPC integration scenario, is a group of BPC views generated.

You can switch between *Basic Mode* and *Expert Mode*. In the basic mode, only the most useful views are shown, while in the expert mode, all the generated views are displayed.

> **i Note**
>
> *Delete* button is used to delete all generated consolidation views from a model. If necessary, you can choose *Generate* button to restore the deleted views later on.

BPC Integration

In the *BPC Integration* tab, you assign a *BPC Consolidation Environment* and a *BPC Consolidation Model* for integration with SAP BPC. This connects the RTC model on the SAP S/4HANA side with its corresponding SAP

BPC model. One combination of *BPC Consolidation Environment* and *BPC Consolidation Model* can only be assigned to one RTC model.

> **i Note**
>
> *RTC Modeling Tool* transaction to assign them to the RTC model. For more information, see Integration with SAP Business Planning and Consolidation [page 30].

Under *Option* , you need to specify the default flow type, which is required for mapping line items of transaction type in the universal journal (table ACDOCA) to the flow type dimension in SAP BPC. If a line item in the `ACDOCA` table doesn't have an associated transaction type, the default flow type specified here is used.

Activate Model

An RTC model has two possible statuses:

- *S*: *Saved*
  The model is persisted but not ready for a consolidation run. Consolidation views can be generated on a model with saved status if the settings are correct.
- *A*: *Active*
  The model is ready for a consolidation run. All the configurations in both SAP S/4HANA and SAP BPC are valid and consistent. Consolidation results can be posted in the consolidation journal (table ACDOCC).

In the BPC integration scenario, you need to finish modeling on the BPC part before activating the model. You also need to note down the view names with suffix `_BPCUNION` for later use, as you should assign these to the BW virtual provider you create. For more information, see section Integration with SAP Business Planning and Consolidation [page 30].

After finishing modeling on the BPC side, you come back here to enter the *BPC Environment* and *BPC Model* names, and activate the model.

In a scenario with no SAP BPC integration, you can activate the model immediately after creating and saving it.

> **i Note**
>
> Before activating your model, you can verify if all the settings are correct and consistent by choosing the *Check* button. The activation action also runs this check.

1.3.7 BRFplus Application

Once your RTC model is activated, an SAP Business Rule Framework plus (BRFplus) application is generated with the name `ZRTC_<your model name>` to host all data validation rules for verifying local reported financial data. Since the RTC consolidation engine only supports vocabulary based on CDS views, the BRFplus application contains the same data objects or fields with the default validation CDS view generated from the RTC model. The validation CDS view calculates opening amounts, year-to-date amounts, prior-year-to-date amounts, period amounts, and prior-period amounts based on different dimensions, for example, entity, partner entity, or account dimension.

If you want to customize your own validation CDS view to meet your business needs, you need to create it using the following parameters:

Sample Code

```
Define view ZCUST_CDS with parameters p_rtc_catg:rtc_dcat,
                p_rldnr: rtc_rldnr,
                p_rvers: rtc_rvers,
                p_entity:rtc_entity,
                p_ryear:ryear,
                p_poper:poper,
                p_timestamp:timestamp
```

After that, you need to associate your own validation CDS view and the associated master data CDS views to the generated BRFplus application. Within the BRFplus application, you should also create a BRFplus function with suffix `_VOC` in the name. In this way, your validation rules can be defined on the data objects contained in the customized CDS view. To do that, refer to the following procedure:

1. Log on to the SAP system with the right client, run the program *BRFplus Workbench* (transaction code `BRF+`). The BRFplus application workbench opens.
2. Find the BRFplus application with the name `ZRTC_<your model name>`.

   > **Note**
   >
   > BRFplus application is client-dependent, so make sure to use the correct client.

3. Create a CDS view-based structure data object as follows:
   1. Right click on the application, choose *Create* > *Data Object* > *Structure*.
   2. Enter a *Name*, select *Binding to CDS View* as the *Binding Type*.
   3. Enter the right CDS view entity name and choose *OK*.
   4. Choose *Create And Navigate To Object*.
   5. *Activate* your object.

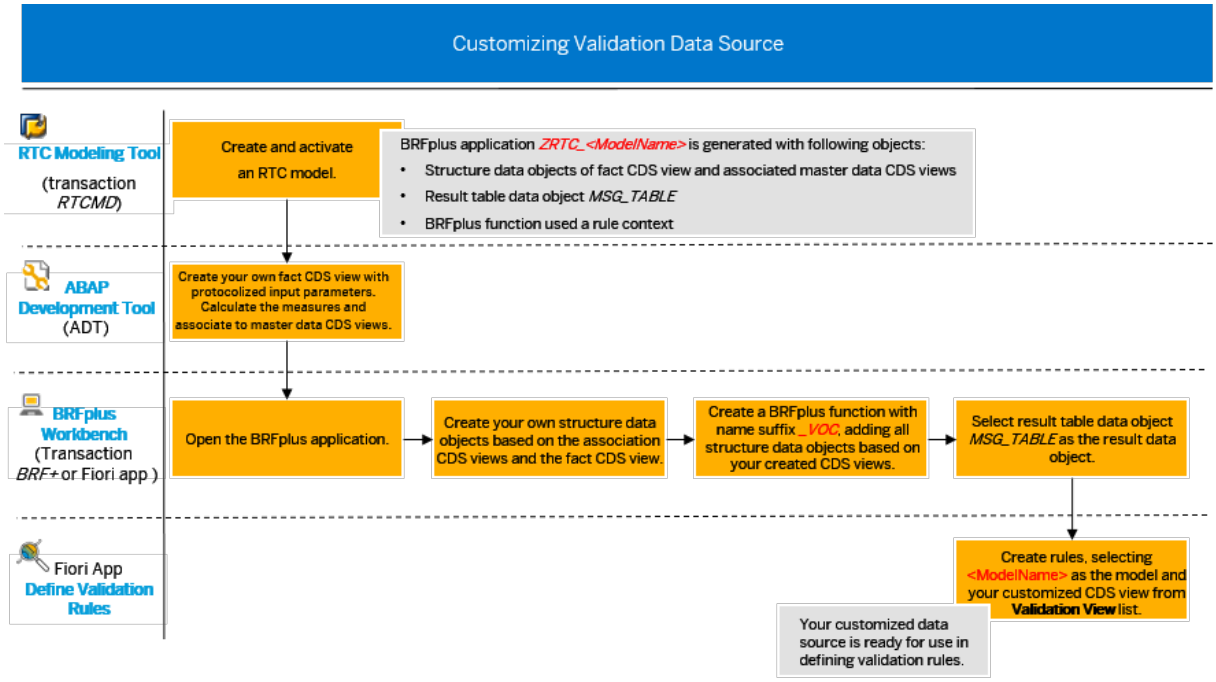
   > **Note**
   >
   > If associations exist on the fact CDS view, you need to first add them as structure data objects. Otherwise, the associations on the fact CDS view cannot be fetched out correctly, and the validation rules will not be run in the right runtime context.

4. Create a BRFplus function to be used as the vocabulary for the RTC validation engine as follows:
   1. Right click the BRFplus application, choose *Create* > *Function*.
   2. Enter a name with the suffix `_VOC`, for example, **`ASSETS_VOC`**. This is required for the RTC validation engine to search for the correct vocabularies.
   3. Choose *Create And Navigate To Object*.
   4. Select *Analytical Mode* from the *Mode* drop-down list.
   5. In the tab *Signature*, select *MSG_TABLE* as the *Result Data Object*.
   6. In the tab *Database Context*, choose *Add Existing Data Object*.
   7. Select your structure data objects based on your created CDS views and *Activate* them.

      > **Note**
      >
      > The association structures also need to be added.

5. Launch the Fiori app *Define Validation Rules* from the SAP Fiori Launchpad to define the rules based on your extended BRFplus function vocabulary. For more information, see Define Validation Rules [page 57].

The following diagram illustrates the procedure described above for customizing the validation data source:



For more information, see the user guide for .

1.3.8 Document Type

Consolidation document types are used to differentiate documents that are generated by various consolidation tasks. Each document type has its controls on how documents are posted into the consolidation journal (table ACDOCC).

Upon activation of a consolidation mode, there are seven default document types generated:

Document Type	Description
00	Flexible Upload
01	Currency Translation
02	Data Release
03	BPC Write-back
04	Defer from Prior Periods
05	Uploaded Data in Staging Area (Posting Level: Null)

Document Type	Description
06	Initial Upload for Consolidation System Cut-over

You can maintain additional document types by defining posting level, balance check behavior, task type, and number range interval. Before that, you must first define the number range intervals to be used for document types, specifying different number range intervals for different consolidation tasks. To do that, perform the following customizing steps:

1. Define number range intervals in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Consolidation Model Definition* > *Consolidation Document Types* > *Define Number Range Intervals*. Alternatively, use transaction code `RTCNR`.
2. Define consolidation document types in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Consolidation Model Definition* > *Consolidation Document Types* > *Maintain Document Types*. Alternatively, use transaction code `RTCDT`.

1.3.9 Transporting Model

Models with an active status can be transported to other systems using a customizing request. You do it by choosing *Transport Model* in the initial screen of the *RTC Modeling Tool* (transaction code *RTCMD*) after selecting the required model.

> **i Note**
>
> In the model transport, only the model data is transported to the target system, while the generated artifacts, for example, SAP HANA calculation views and CDS views, are not transported. You need to regenerate these artifacts in the target system after the transport.

> **i Note**
>
> Validation rules are not transported with the model. A separate tool is available to transport validation rules. For more information, see Define Validation Rules [page 57].

1.4 Integration with SAP Business Planning and Consolidation

Once you have defined the Real-Time Consolidation (RTC) model on the SAP S/4HANA side, you must perform the relevant settings on SAP BW to integrate the SAP S/4HANA model with SAP BPC. RTC provides both the transaction data and master data to SAP BPC, which runs consolidation directly with the real-time data and writes the consolidated results back to the consolidation journal (table `ACDOCC`).

1.4.1 Setting Up BW InfoObjects

By using virtual BW InfoObjects, you can read and use the master data from SAP S/4HANA Finance in SAP BPC. A virtual InfoObject is assigned with an SAP HANA calculation view on the corresponding master data. It can have multiple properties, which are known as InfoObjects attributes.

In RTC, SAP HANA calculation views are pre-delivered for fetching master data for the virtual InfoObjects, for example, `/ERP/GL_ACCT` and `/ERP/ECOMP`. On the other hand, master data of BPC dimensions *Group* (/ERP/GROUP), *BPC Audit* (/ERP/AUDIT), and *BPC Currency* (/ERP/RTCCURR) have no base tables from the accounting system in SAP S/4HANA. In this case, you can use physical InfoObjects to store the dimension data and maintain it in the BW repository manually.

RTC master data comes from *G/L Accounting* base tables, such as `SKA1` (*G/L Account*), `T880` (*Entity Company*), and `CSKS` (*Entity Cost Center*). Since properties of base table entries are not sufficient for BPC dimension settings, extension tables such as `RTC_EXT_SKA1` and `RTC_ENTITY_M` are introduced, and maintenance views developed for maintaining backend master data, for example, with transaction codes `RTCGLA` and `RTCENT`. For more information, see Extending Master Data Properties [page 39].

You can combine virtual InfoObjects and physical InfoObjects in one InfoProvider. The difference between the two is that a virtual InfoObject can reduce data redundancy, while a physical InfoObject can provide more flexibility, especially when some required SAP BPC dimensions do not exist in the SAP S/4HANA context.

The pre-delivered InfoObjects can be found in the BW InfoArea `/ERP/RTC` and the corresponding SAP HANA calculation view under the package `sap.erp.sfin.rtc`. The pre-delivered InfoObjects and their mappings to BPC dimension attributes are summarized in the table below:

BPC Dimension Type	Dimension InfoObject	Dimension IOBJ Description	Predefined Attributes	Attribute InfoObject	Attribute Description
Any Dimension			DIMLIST	/ERP/DIMLIST	BPC Dimlist
			ENABLEJNR	/ERP/ENA_JNR	BPC EnableJNR
Account - A	/ERP/GL_ACCT	G/L Account	*ACCTYPE	/ERP/GLAGR	BPC Account Type
			*RATETYPE	/ERP/EXRATETY	BPC Exchange Rate Type
			ELIMACC	/ERP/ELIMACCT	BPC Elimination Account
			TYPELIM	/ERP/TYPELIM	BPC TypElim
Category - C	/ERP/CATEGORY	Category	FX_DIFFERENCE_ONLY	/ERP/FXDIFFOL	BPC FX Difference Only
			FX_SOURCE_CATEGORY	/ERP/FXSCATG	BPC FX Source Category

BPC Dimension Type	Dimension InfoObject	Dimension IOBJ Description	Predefined Attributes	Attribute InfoObject	Attribute Description
			CATEGORY_FOR_OPE	/ERP/OPECATG	BPC Opening Category
			DATA_SUBMIT	/ERP/DATSUB	BPC Data Submit
			OPENING_PERIOD	/ERP/OPEPER	BPC Opening Period
			OPENING_YEAR	/ERP/OPEYEAR	BPC Opening Year
			OWN_CATEGORY	/ERP/OWNCATG	BPC Own Category
			OWN_PERIOD	/ERP/OWNPER	BPC Own Period
			OWN_YEAR	/ERP/OWNYEAR	BPC Own Year
			RATE_CATEGORY	/ERP/RATECATG	BPC Rate Category
			RATE_PERIOD	/ERP/RATEPER	BPC Rate Period
			RATE_YEAR	/ERP/RATEYEAR	BPC Rate Year
Audit - D	/ERP/AUDIT	RTC Audit	*COPYOPENING	/ERP/CPOPEN	BPC Copy Opening
			*DATASRC_TYPE	/ERP/DSTYPE	BPC DataSource Type
			*IS_CONSOL	/ERP/ISCONS	BPC Is Consolidated
			*IS_CONVERTED	/ERP/ISCONV	BPC Is Converted
			*OPENING_DATASRC	/ERP/OPENDS	BPC Opening DataSource
			DATASRC_STAGE	/ERP/DSSTAGE	BPC DataSource Stage
			IC_ORIGINE	/ERP/ICORGI	BPC IC Origin

BPC Dimension Type	Dimension InfoObject	Dimension IOBJ Description	Predefined Attributes	Attribute InfoObject	Attribute Description
Entity - E	/ERP/ECOMP /ERP/EPRCTR /ERP/ENTITY	RTC Entity Company RTC Entity Profit Center RTC Entity	*INTCO	/ERP/ICOMP /ERP/IPRCTR /ERP/PENTITY	RTC Intercompany RTC Intercompany Profit Center RTC Partner Entity
			*CURRENCY	/ERP/RTCCURR	RTC Currency
			CONTROL_LEVEL	/ERP/CTRL_LVL	BPC Control Level
			CTRL_CURRENCY_NOT_LC	/ERP/CTRL_CNL	BPC Control Currency Not LC
			ELIM	/ERP/ELIM	BPC Elimination
			FX_TYPE	/ERP/FX_TYPE	BPC FX Type
Intercompany - I	/ERP/ICOMP /ERP/IPRCTR /ERP/PENTITY	RTC InterCompany Company RTC InterCompany Profit Center RTC Partner Entity	*ENTITY	/ERP/ECOMP /ERP/EPRCTR /ERP/ENTITY	RTC Entity Company RTC Entity Profit Center RTC Entity
Group - G	/ERP/GROUP /ERP/GROUPPRC /ERP/RGROUP	RTC Group RTC Group for Profit Center RTC Group with ENTITY	*CONSO_TYPE	/ERP/CONSTP	BPC Consolidation Type
			*CURRENCY_TYPE	/ERP/CURRTP	BPC Currency Type
			*FIRST_CONS_DATE	0DATE	Date
			*GROUP_CURRENCY	/ERP/RTCCURR	RTC Currency
			*PARENT_GROUP	/ERP/PARGROUP /ERP/GROUPPRP /ERP/PGROUP	BPC Parent Group RTC Group for Profit Center BPC Parent Group with Entity
			*STORE_GROUP_CURR	/ERP/STORGCUR	BPC Store Group Currency

BPC Dimension Type	Dimension InfoObject	Dimension IOBJ Description	Predefined Attributes	Attribute InfoObject	Attribute Description
			DATASRC_LEVEL	/ERP/DSLVL	BPC DataSource Level
			ENTITY	/ERP/ECOMP /ERP/EPRCTR /ERP/ENTITY	RTC Entity Company RTC Entity Profit Center RTC Entity
			STAGE_ONLY	/ERP/STAGEOL	BPC Stage Only
			STORE_ENTITY	/ERP/STENTITY	BPC Store Entity
Currency - R	/ERP/RTCCURR	RTC Currency	*CURRENCY_TYPE	/ERP/CURRTP	BPC Currency Type
			*REPORTING	/ERP/REPORTIN	BPC Reporting
			MD	/ERP/MD	BPC MD
Subtable - S	/ERP/FLOW	RTC FLOW	*FLOW_TYPE	/ERP/FLOWTP	BPC Flow Type
User Defined - U	/ERP/RMODEL	RTC MODEL			
	/ERP/TRSLIND	RTC Translation Indicator			
Key Figure	/ERP/RTC_AMO	RTC Amount			

> **i Note**
>
> Required BPC mapping attributes are indicated by an asterisk *.

For more information about SAP Business Planning and Consolidation dimension attributes, see `Application Help for SAP BusinessObjects Planning and Consolidation, version for SAP NetWeaver` on SAP Help Portal at https://help.sap.com/bopacnw101. Choose *Administration* > *Legal Consolidation (Embedded only)* > *Set Up a Consolidation Model (Embedded only)* > *Maintain InfoObject Attributes (Embedded only)*.

1.4.2 Creating BW InfoProviders

You create SAP BW InfoProviders to form an OLAP data model for SAP BPC to use. On the one hand, it maps to SAP HANA views for transactional data. On the other hand, it connects each field with InfoObjects to build dimensions.

Prerequisites

You must have completed the following prerequisites:

- You have generated consolidation views in the Model Setup [page 23] step.
- The generated SAP HANA calculation views are in the same package as the consolidation foundation view.

Create a VirtualProvider

You must use a BW VirtualProvider to allow SAP BPC to write data back to the consolidation journal (table ACDOCC). An ABAP class is needed to input your write-back logic. Formally, SAP BPC writes back the consolidated results into a BW InfoCube, but in Real-Time Consolidation (RTC), an InfoCube is no longer necessary as the consolidated results can be directly stored in the consolidation journal (table ACDOCC).

You can refer to an example of this write-back class and either use it or copy and modify it. To do so, you must perform the following steps:

1. In the *SAP Easy Access* menu, choose *Tools* > *ABAP Workbench* > *Development* > *Class Builder* (transaction code SE24) and open ABAP class CL_RTC_ACDOCC_IPROV_WRITABLE.
2. Assign this class to your VirtualProvider.
   If you want to add additional logic, you can copy this write-back class and modify it.

You can find the BPC union view (with naming convention RTC_C_<CLIENT><MODEL>_BPCUNION) in the RTC modeling tool, which can be accessed from the *SAP Easy Access* menu by choosing *Accounting* > *Real-Time Consolidation* > *Modeling* > *Maintain Model* (transaction code RTCMD). In the *Consolidation Views* tab of your model, the union view is listed along with any other generated views.

To create a VirtualProvider, you can use the Eclipse-based SAP BW modeling tools. For detailed steps, look for *Creating VirtualProviders Based on an SAP HANA Model* in the documentation of SAP NetWeaver, available at https://help.sap.com.

You must also assign each field of your VirtualProvider to an InfoObject. Refer to the following table for the InfoObjects assignments:

Field Name	InfoObject Name	Description
FISCYEARPER	0FISCPER	Fiscal year / period
PERIV	0FISCVARNT	Fiscal year variant
RACCT	/ERP/GL_ACCT	G/L Account
ENTITY	/ERP/ENTITY	Entity
PENTITY	/ERP/PENTITY	Intercompany
BPC_CATG	/ERP/CATEGORY	Category
RMVCT	/ERP/FLOW	Flow

Field Name	InfoObject Name	Description
RCONGR1	/ERP/RGROUP	Group
DIM	/ERP/RTCDIM	RTC Dimension
AUDIT_TRA	/ERP/AUDIT	Audit
CONS_CUR	/ERP/RTCCURR	Currency
MODEL	/ERP/RMODEL	Consolidation Model
KTOPL	/ERP/CHRTACCT	Chart of Accounts
CONS_SL	/ERP/RTC_AMO	Amount

Create a CompositeProvider

A CompositeProvider is optional, however, if you want to join other BW cubes for the legacy data, it is recommended you have a CompositeProvider which encapsulates the VirtualProvider you just created.

For detailed steps on how to create a CompositeProvider, look for *Creating CompositeProviders* in the documentation of SAP NetWeaver, available at https://help.sap.com.

Create an Aggregation Level

You must build an aggregation level on the CompositeProvider. Aggregation level is mandatory for modeling in SAP BPC. You must make sure the aggregation level contains all the dimensions by the consolidation engine in SAP BPC.

For more information on how to create an aggregation level, look for *Creating Aggregation Levels* in the documentation of SAP NetWeaver, available at https://help.sap.com.

Create Rate Cube and Ownership Cube

A rate cube is a supporting InfoProvider for consolidation models in SAP BPC. It is used to store exchange rates that support currency conversion in financial models.

The ownership cube is also a supporting InfoProvider for consolidation models in SAP BPC. It stores information such as the consolidation methods, ownership percentages, and group roll-up information used for legal consolidation.

You must create a rate cube and an ownership cube with following required dimensions:

BW Cubes	Dimensions
Rate cube	Account (A)
	Category (C)
	Entity (E)
	Time (T)
	Currency (R)
Ownership cube	Account (A)
	Category (C)
	Entity (E)
	Time (T)
	Intercompany (I)
	Group (G)

1.4.3 Setting Up Write-Back to SAP S/4HANA

The consolidated results produced by SAP BPC are saved in the consolidation journal (table `ACDOCC`). This process is called write-back because SAP BPC first reads data from SAP S/4HANA, performs the consolidation tasks, and then saves the results back into SAP S/4HANA.

To do this, you need to assign an ABAP class to your VirtualProvider by following the steps in Create BW InfoProviders [page 34]. You also need to assign consolidation document types to control how SAP BPC posts consolidation documents.

Create Your Own Write-Back Class

SAP delivers a standard write-back class `CL_RTC_ACDOCC_IPROV_WRITABLE`, which is sufficient for most use cases. However, if you have specific logic that must be applied during write-back, you can refer to the delivered ABAP class to write your own write-back logic.

This class implements three interfaces:

- `IF_RSDRV_RPROV_WRITABLE`
- `IF_RSDRV_RPROV_LOCK_NOSID`
- `IF_RSDRV_VPROV_LOC_NOSID_QUERY`

The main method is `WRITE_DATA`. You can customize it according to your needs, but it must contain the following data process logic:

- Map field values from the VirtualProvider to table fields
- Modify table fields' values
- Post documents to the consolidation journal (table `ACDOCC`)

Assign Document Types for Write-Back

When SAP BPC writes the consolidated results back to the consolidation journal (table `ACDOCC`), the document types are automatically determined by the value combination of the following fields:

- *Real-Time Consolidation Model*
- *Category*
- *Transaction Type*
- *Audit Trail*

You maintain the document type determination rule for the write-back in Customizing for *Financial Accounting* under ▶ *Real-Time Consolidation* ▶ *BPC Integration* ▶ *Assign Document Types for BPC Write-Back* ▶. Alternatively, use transaction code `RTCWB`.

> **i** Note
>
> You must at least have one document type determination rule defined for a consolidation model, or your model cannot be activated.

Prerequisites

You have defined the required consolidation document types by following the procedure described in Document Type [page 29].

1.4.4 Finalizing and Activating RTC Model

Prerequisites

You have created your model in SAP S/4HANA, as instructed in Model Setup [page 23].

You have completed all the mandatory configurations on the SAP BPC side, in the activities listed under Integration with SAP Business Planning and Consolidation [page 30].

In order to finalize and activate your model in RTC, you must have created your embedded environment and consolidation model in SAP BPC. For instructions on how to do so, see section `Create an Environment` and `Create a Consolidation Model` in Setting Up Consolidation Models [page 41] in the SAP BPC configuration chapter.

Activate the Model

Once you have defined the SAP BusinessObjects Planning and Consolidation model, return to the Real-Time Consolidation modeling tool from the *SAP Easy Access* menu by choosing *Accounting* > *Real-Time Consolidation* > *Modeling* > *Maintain Model* (transaction `RTCMD`) and complete the following steps:

1. In the *BPC Integration* tab, assign the *BPC Consolidation Environment* and the *BPC Consolidation Model*.

   > **i Note**
   >
   > The specified combination of BPC environment and model must exist.

   The system reads the settings from the model on the SAP BPC side, such as the dimension field, fiscal year variant, chart of accounts, and so on. You therefore need not make these settings again on the RTC side.
2. Perform any necessary checks, and if all settings are correct, activate the RTC model.

This completes all the modeling activities specific to RTC. You must next define SAP BPC business rules, controls, and other settings required by SAP BPC before you can run these consolidation tasks. For more information, see Configuration in SAP BusinessObjects Planning and Consolidation [page 41].

> **i Note**
>
> After your final installation and deployment of Real-Time Consolidation, it is important to do the following: In the *RTC Modeling Tool* transaction (`RTCMD`), choose *Utilities* > *Renew Posting API*, so that the code will be generated according to the structure of `ACDOCC`. `ACDOCC` contains COPA fields, and if you make any adjustments on COPA, you will also need to run the *Renew Posting API* to ensure the posting program works correctly.

1.4.5 Extending Master Data Properties

For some master data, several properties are required by the consolidation engine of SAP Business Planning and Consolidation (SAP BPC) to ensure correct execution of consolidation tasks. To serve that purpose, you need to extend these properties for the master data entity, account, and flow type.

For more information about the BPC-required dimension properties, see the online help section `Maintain InfoObject Attributes (Embedded Only)` of SAP Business Planning and Consolidation 10.1, version for SAP Netweaver available at https://help.sap.com/bopacnw101.

1.4.5.1 Entity

A consolidation entity is the smallest element in a corporate group structure that can be used as a basis for complete consolidation.

You extend the entity properties in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *BPC Integration* > *BPC Property Extension Maintenance* > *Extend Entity Properties for BPC*. Alternatively, use transaction code `RTCENT`.

For each entity, you define the following extended properties as necessary:

- `BPC CONTROL_LEVEL`: Enter value **`1`**~**`4`** to indicate the control level with 4 being the strictest option.
- `BPC CTRL_CURRENCY_NOT_LC`: Enter **`Y`** to use a specified reporting currency other than the local currency of the entity.
- `BPC DIMLIST`: To group the entities that share the same value in the field when applying certain business rules.
- `BPC ELIM`: Enter **`Y`** to indicate the entity as an elimination entity.
- `BPC ENABLEJNR`: Enter **`Y`** to allow display in journals.
- `BPC FX_TYPE`: To assign a set of currency translation rules to the entity.

Prerequisites

You have created consolidation entities following the procedure described in the section Consolidation Dimension and Entity [page 18].

1.4.5.2 Account

Account defines the chart of accounts for the model and how these accounts are calculated and aggregated.

You extend the G/L account properties in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *BPC Integration* > *BPC Property Extension Maintenance* > *Extend G/L Account Properties for BPC*. Alternatively, use transaction code `RTCGLA`.

For each G/L account defined per chart of accounts, you define the following extended properties:

- `BPC DIMLIST`: To group the accounts that share the same value in the field when applying certain business rules.
- `BPC ENABLEJNR`: Enter **`Y`** to allow display in journals.
- `BPC TYPELIM`: To apply the same processing to several accounts having the same property value.
- `RATETYPE`: It is short for **Exchange Rate Type**, and used to determine the business rules applied when translating the account from the local currency to the reporting or group currency.
- `ACCTYPE`: It is short for **BPC Account Type**, and can have a value **`INC`**, **`EXP`**, **`AST`**, or **`LEQ`**.
- `ELIMACC`: It is short for **BPC Elimination Account** used in the elimination process as a difference account.

Additionally, you can also maintain the following G/L account properties:

- *G/L Account Type*: It defines the purpose of the account in the chart of accounts, and can have one of the following predefined values: *Balance Sheet Accounts*, *Secondary Costs*, *Nonoperating Expense or Income*, or *Primary Costs or Revenue*.

- *Account Group*: It is used to combine accounts with the same functional area, fields in the master record, and account number range. You can choose from the following predefined values: *Asset Accounts*, *P&L Statement Accounts*, *Financial Accounts*, *Materials*, *G/L Accounts*, or *Secondary Costs/Revenues*.
- *Mark for Deletion*
- *Text*: To define a short text and long text description for the accounts in your chosen languages.

Prerequisites

You have defined the required account master data. This is done from the *SAP Easy Access* menu by choosing *Accounting* > *Financial Accounting* > *General Ledger* > *Master Records* > *G/L Accounts* > *Individual Processing* > *In Chart of Accounts* (transaction `FSP0`).

1.4.5.3 Transaction Type (Flow Type)

Transaction type classifies business transactions and their associated accounts for the validation before posting. You need to map the transaction type to the flow type dimension in SAP BPC, and extend its properties as necessary.

You do this in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *BPC Integration* > *BPC Property Extension Maintenance* > *Extend Transaction Type for BPC*. Alternatively, use transaction code `RTCTTP`.

For each transaction type, assign a balance carryforward transaction type and define the following properties:

- `FLOW_TYPE`: To enable tracking changes within account activities, such as opening balance, additions, subtractions, and currency translation adjustments.
- `BPC DIMLIST`: To group the flows that share the same value in the field when applying certain business rules.
- `BPC ENABLEJNR`: Enter **`Y`** to allow display in journals.

1.5 Configuration in SAP Business Planning and Consolidation

After performing all the configurations mentioned above, you can follow the configurations in this chapter to carry out various consolidation tasks and monitor their processes in SAP BPC.

1.5.1 Setting Up Consolidation Models

The finance department of a corporation uses legal consolidation to consolidate numbers from its subsidiaries and to produce consolidated financial statements of this group of legal entities at the end of a financial period.

SAP BPC consolidation engine provides a framework for you to set up your own business scenario freely and generate consolidated financial statements automatically.

In general, to build up your Real-Time Consolidation scenario in SAP BPC, you first need to build an embedded environment and create a BPC consolidation model within it. During the creation of the consolidation model, you need to reference necessary BW InfoProviders for consolidation, map all dimensions required by SAP BPC to the InfoObjects inside the referenced InfoProviders, as well as map necessary dimension properties to InfoObjects attributes based on your business requirements. After the consolidation model is created, you can use Business Rules to configure your own consolidation rules. Then you will be able to run the consolidation-related processes, such as currency translation and eliminations and adjustments from the *Consolidation Monitor*.

Create an Environment

An embedded typed environment is a container of all your models in SAP BPC. Before you create your consolidation model, you must first create an embedded environment to store your consolidation models for Real-Time Consolidation. For details on environment creation, look for *Administration* > *Consolidation (Embedded only)* > *Create an Embedded Environment* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Create a Consolidation Model

In SAP BPC, a model is either a planning model or a consolidation model. In order to run consolidation-related tasks, you must create a consolidation model in SAP BPC. When a consolidation model is created, it must reference CONSOLIDATION & OWNERSHIP InfoProviders. EXCHANGE RATE & SOURCE InfoProviders are optional.

The InfoProviders are as follows:

- CONSOLIDATION InfoProvider
  This is the main InfoProvider containing all financial data. All consolidation postings such as eliminations and minority interest calculations are posted in this InfoProvider.
- OWNERSHIP InfoProvider
  The OWNERSHIP InfoProvider manages the organization structure and ownership percentages.
- EXCHANGE RATE InfoProvider
  This InfoProvider contains all currency exchange rates for the different rate types, such as average and sport rate. Currency conversion applies to consolidation models to which a corresponding RATE InfoProvider has been referenced.
- SOURCE InfoProvider
  This InfoProvider can be used as source data if the user has a non-planning InfoProvider, which contains the source data for consolidation. If you refer to this InfoProvider, then you must make sure it contains the same dimensions (InfoObjects) as defined in the CONSOLIDATION InfoProvider.

For more details on consolidation model creation in SAP BPC, see *Administration* > *Consolidation (Embedded only)* > *Set up a Consolidation Model (Embedded only)* > *Create or Modify a Consolidation Model* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Map Dimension

For each InfoProvider referenced by a consolidation model, there are some mandatory dimension types for SAP Business Planning and Consolidation to understand your business data and perform the consolidation tasks. As a result, after you select the preferred InfoProviders (CONSOLIDATION, OWNERSHIP, EXCHANGE RATE and SOURCE InfoProvider) to be referenced in the consolidation model, you need to further map the InfoObjects inside each InfoProvider to dimension types required by the SAP BPC consolidation engine.

For details on each InfoProvider's required dimension types and how to map required dimension types, see *Administration* > *Consolidation (Embedded only)* > *Set up a Consolidation Model (Embedded only)* > *Create InfoObjects and InfoProviders* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Map Dimension Properties

When you map the required InfoProviders to a consolidation model, all the underlying dimensions will be automatically referred into the dimension library. To ensure the correct operation of consolidation and related processes (such as currency translation, simulation, and eliminations and adjustments), several dimension properties are required by SAP BPC's consolidation engine and you need to ensure that these properties are already maintained in SAP BW so that they can be further mapped to when you create a consolidation model in SAP BPC. You also need to make sure that these properties are maintained with the expected values for corresponding consolidation processes by your business demands.

For details on the usage of each dimension type's properties and how to map dimension properties, see *Administration* > *Consolidation (Embedded only)* > *Set up a Consolidation Model (Embedded only)* > *Maintain InfoObject Attributes* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

1.5.2 Business Rules Management

Business rules are parameter-driven functions within SAP BPC models for calculating and posting monetary amounts in support of common consolidation activities, such as intercompany booking, currency translation, US Elimination and eliminations and adjustments.

Account Transformation Rule

Account-based calculations read and aggregate the values posted to specific combinations of accounts, flow types, and audit members in order to post the aggregated amount under an alternate destination account, flow and audit member combination.

For details on this business rule, look for *Administration* > *Rules* > *Business Rules Management (Embedded only)* > *Account-based Calculation Rule (Embedded only)* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Currency Translation Rule

You use this to convert local currency values into one or more reporting or group currencies in accordance with major Generally Accepted Accounting Principles. Currency translation rules are executed from the Consolidation Monitor.

For details on this business rule, look for *Administration* > *Rules* > *Business Rules Management (Embedded only)* > *Currency Translation Rule (Embedded only)* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Intercompany Booking Rule

The intercompany booking function supports the overall intercompany reconciliation process.

For details on this business rule, look for *Administration* > *Rules* > *Business Rules Management (Embedded only)* > *Intercompany Booking Rule (Embedded only)* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Eliminations and Adjustments Rule

You use this type of business rule when performing a legal consolidation process to generate adjustments and postings that integrate results from subsidiary reporting entities into consolidated financial statements in accordance with Generally Accepted Accounting Principles. Eliminations and adjustments are executed from the Consolidation Monitor.

For details on this business rule, look for *Administration* > *Rules* > *Business Rules Management (Embedded only)* > *Eliminations and Adjustments Rule (Embedded only)* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

US Eliminations Rule

US Eliminations Rule is specifically designed to address the posting of intercompany eliminations in simpler scenarios where a full legal consolidation model is not required. US Eliminations are executed from the Consolidation Monitor.

You can define two different consolidation models for Eliminations and Adjustments type business rules and US Eliminations business rules. But if you want to leverage one consolidation model to perform both Eliminations and Adjustments and US Eliminations activities - which is generally called matrix consolidation in BPC - a different set of Entity (P type) and Interco dimensions (Q type) needs to be maintained in the model.

For details on this business rule, look for *Administration* > *Rules* > *Business Rules Management (Embedded only)* > *US Eliminations Rule (Embedded only)* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Carry-Forward Rule

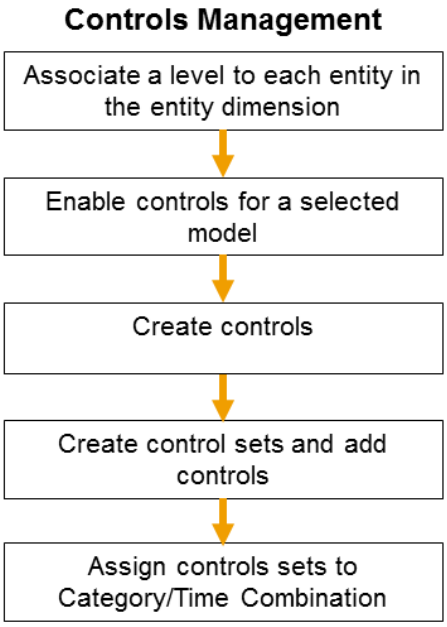
Carry-forward populates the opening balances for the current year with the closing balances of the last period of the prior year.

For details on this business rule, look for *Administration* > *Rules* > *Business Rules Management (Embedded only)* > *Carry-Forward Rule (Embedded only)* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

1.5.3 Controls

In SAP Business Planning and Consolidation, controls enable users to set certain rules and test the validity of the financial data gathered in a reporting process. For example, a control can be used to check whether assets equal liabilities for data entered in data entry schedules or for adjustments entered in journals.

Controls are run on the data available in the model (in loaded data, translated data or consolidated data) on base entities. The main steps to follow when setting up your controls are as follows:



Controls Management

Enable and Create Controls

For information on how to associate entity levels, enable controls on a model and detailed information about creating a control, look for *Administration* > *Rules* > *Controls* > *Create a Control* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Create Control Sets

A control set is a grouping of controls. Control sets are associated to a particular model.

For detailed information about how to create control sets, look for *Administration* > *Rules* > *Controls* > *Working with Control Sets* > *Create a Control Set* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Edit Control Set Assignments

To execute a control set, users must specify when they want control sets to be run and on what type of data. This is done by assigning at least one Category/Time dimension pair to your control set.

For detailed information about assigning category/time pairs to control sets, look for *Administration* > *Rules* > *Controls* > *Working with Control Sets* > *Assign a Control Set* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

1.5.4 Journals

In SAP Business Planning and Consolidation, journals allow users to make further adjustments to data in the database, typically as part of the month-end or quarter-end process. During the review and analysis step, journals allow users to capture an audit trail of the changes and adjustments made to the database.

The primary requirement for journals is to track changes to data after the initial source data is input into the model. The model users can adjust this data and also track and report on the changes by, for example, amount, date, and user.

Before users can adjust data in the database using the *Journals* feature, an administrator must perform relevant tasks including setting up journal templates, set journal model parameters and applying BAdIs if necessary.

Create Journal Templates

A journal template is an input form into which users enter journal entries. You can set up one or more journal templates for each model and define journal reopen rules.

For detailed information, look for *Administration* > *Journal Administration* > *Journal Template Creation* in the application help for Controls SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Set Journal Model Parameters

Model parameters are used to define conditions for journals. For detailed information, look for *Administration* > *Journal Administration* > *Journal Template Creation* > *Journal Model Parameters* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

Create BAdIs to Generate Calculated Amounts

When saving a journal, users can add or calculate extra amounts by implementing the Business Add-In (BAdI) `UJJ_CALCULATED_AMOUNT`.

For detailed information, look for *Administration* > *Journal Administration* > *BAdI for Generating Calculated Amounts When Saving a Journal* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

1.5.5 Consolidation Monitor

The Consolidation Monitor is a global dashboard for monitoring the consolidation progress of different consolidation tasks in a specific consolidation scope, which is made up of a category, period, group, or sub-group. Before that, you first need to define which consolidation tasks you would like to trigger, as well as set the sequence of tasks to be displayed in Consolidation Monitor via Task Sequences.

For detailed information, look for *Administration* > *Consolidation (Embedded only)* > *Set Task Sequence* and *Run Consolidation* > *Consolidation Monitor* in the application help for SAP Business Planning and Consolidation, add-on for SAP S/4HANA, available at http://help.sap.com/bopacnw101.

1.6 Currency Translation

Two currency translation modes *Currency Translation in Consolidation* and *Currency Translation in Accounting* are available for you to choose from during model creation.

With the mode `0` *Currency Translation in Consolidation*, currency is translated in consolidation systems such as real-time consolidation (RTC) in SAP S/4HANA or SAP BPC during consolidation.

- In the RTC currency translation feature, the translation method allows local accountants to translate the locally reported financial data into group currency so that data validation can take place before the data is released to group accountants for consolidation. In this way, any data errors can be detected earlier and corrected at source before period end, which in turn significantly increases system performance and data traceability.
- If only the amounts in local currencies are collected, group accountants can use the currency translation feature in SAP BPC.

With the mode `1` *Currency Translation in Accounting*, the amount is translated in the financial accounting system during document posting or later in currency revaluation, or using the revaluation tools of G/L accounting. Given that the currency is already uniformed in the universal journal entries, the amounts can be used as they are or re-evaluated at period end for consolidation.

No matter which translation mode you choose, translation methods are applicable. That is, a translation method can be used in RTC translation, BPC translation rules, or translation in G/L accounting.

> **Example**
>
> Your model is set to the translation mode `1` *Currency Translation in Accounting*. Entity A has its translated data in the universal journal (`ACDOCA` table), that is the translation feature in G/L accounting is used, so assigning translation methods is not necessary. Entity B submits its local amounts by using flexible upload, then you need to assign a translation method to it so that the local amounts can be translated into group amounts before data release. Even after group amounts for both entity A and B are reported, group accountants can still run BPC translation rules to make further adjustments, for example, based on some new exchange rates.

This section mainly introduces the translation methods as in the RTC translation feature. An RTC translation method contains translation logic, settings for the exchange rate, document type, and relevant posting accounts. As detailed in the following sections, the basic configuration procedure is same for both modes, except mode `1` needs an adjustment in the foundation view to align currency fields.

Prerequisites

Model

Currency translation methods are defined under an RTC model, so the required model must be in place before defining the currency translation method.

For more information, see Model Setup [page 23].

Currency Translation Keys

Currency translation keys map to translation algorithms. SAP delivers the following currency translation keys:

Currency Translation Key	Short Description	Description
01	Year-to-date amount	Translation of cumulative amount at rate for current period.
03	Historical amount in investment table	Historical transaction using changes in investments.
04	Historical amount in equity table	Historical transaction using changes in investee equity.
05	Current period amount	Translation using the monthly rate in the exchange rate table.
06	Existing group currency amount	No retranslation of existing group currency values. The group currency values will not be changed.

You can also define your own translation algorithms using `Scalar User-Defined Function` (UDF) in SAP HANA Studio and register them with currency translation keys in your own namespace (starting with 9, A~Z).

You define currency translation keys in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Currency Translation Definition* > *Define Currency Translation Keys*. Alternatively, use transaction code `RTCCTK`.

For more information, go to the SAP HANA Platform Help Portal page at https://help.sap.com/boaa, and look for the *SAP HANA SQLScript Reference* > *Logic Container* > *User-Defined Function*.

Exchange Rate Indicator

Exchange rate indicators are used in currency translation methods to determine the exchange rate. You must first define the currency and exchange rate types, then create exchange rate indicators and map them to exchange rate types.

You define currency and exchange rate types in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Currency Translation Definition* > *Define Currency and Exchange Rate Types*.

You define exchange rate indicators and assign them to exchange rate types in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Currency Translation Definition* > *Define Exchange Rate Indicator*.

> **i Note**
>
> When defining an exchange rate indicator, you can assign the same indicator with multiple consolidation variants, each mapping to a different exchange rate type. In this way, when you run currency translation on the same data using the same translation method, you have the option to use different exchange rates by choosing the version that includes your desired variant.

Selections

A selection is a model-dependent object that bundles a group of filter criteria to further filter data in a consolidation view. Therefore, when defining currency translation methods or rounding methods, selections can be conveniently reused as filter conditions to select source data based on fields such as accounts, transaction types, and other characteristics.

> **i Note**
>
> Filters defined using selections can only be applied to base consolidation views (with name suffix `_U` or `_Uxx`).

When defining selections, you can select one of following selection types:

- *Default Selection*: It's comprised of multiple filter expressions, each of which is defined as a range of characteristics.
- *Based on Set*: If you already have sets maintained in G/L accounting, you can reuse these sets in a selection.
- *Composite Selection*: It can combine multiple defined selections connected with the "OR" operator to form a filter condition.

You define selections in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Currency Translation Definition* > *Define Selections*. Alternatively, use transaction code `RTCSEL`.

> **i Note**
>
> Defining reusable selections is not a mandatory prerequisite for setting up the currency translation process, because you can also maintain selections directly within the method maintenance procedure, however, those selections cannot be reused in other methods.

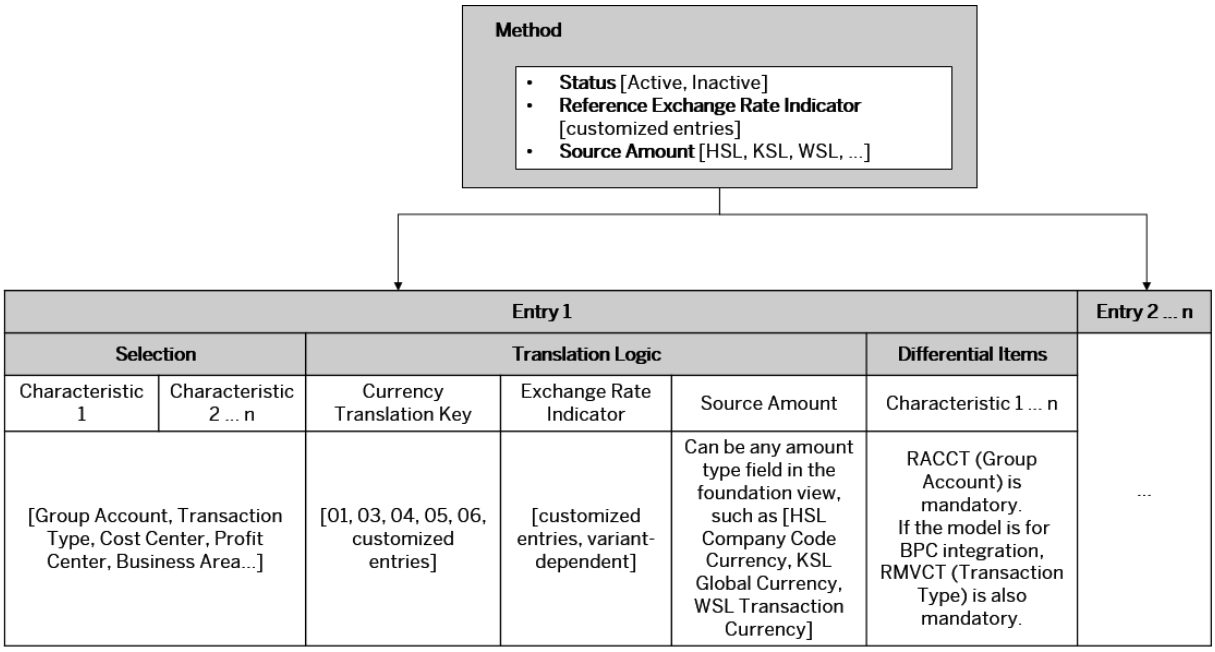
1.6.1 Currency Translation Method

Currency translation methods contain the rules for Real-Time Consolidation (RTC) currency translation. To be more specific, they determine the exchange rate to be used, the translation algorithm, how translation differences are posted, and how rounding is processed.

Currency translation methods are initially created under an RTC model, and later on these methods can be assigned to consolidation ledger and individual entities.

You define currency translation methods in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Currency Translation Definition* > *Define Currency Translation Methods*.

Within a currency translation method, there are different levels of settings as shown in the below diagram:



A method can include multiple entries, each of which specifies different filtered accounts, applied translation logic, and the differential items to be posted to.

Method Level

The following fields are included at the method level:

- *Status*
  The status of the currency translation method is displayed beside the *Translation Method* field. The method can only be used when its status is *Active*. If you save a method without activating it, the method has the status *Inactive*.
- *Description*
  Text description of the currency translation method.
- *Reference Exchange Rate Indicator*
  The exchange rate to be used for those accounts that are not specifically set at any entry level. It typically has an exchange rate type *Current Exchange Rate*, sometimes also referred to as the **spot exchange rate**. In general, the reported data in the local currency amount is first translated with the reference exchange rate for all accounts into the group currency. This first translation helps track down translation differences in a later step and ensures that the overall financial statements are balanced. In the second step, the local currency amounts of the specific accounts are translated by applying the exchange rate types (current, average, or historical exchange rate) and the currency translation keys you specified at method entry level. Any amount differences between the two translations are posted to your specified accounts for differential items.
  The translated amounts using reference exchange rate are displayed in the *Reference Amount* column with a *Translation Indicator* `00` in the currency translation details log.

> **i Note**
>
> The translation using *Reference Exchange Rate* always runs on the year-to-date (YTD) value as indicated by *Currency Translation Key* `01` in the detail log. We recommend that you specify the accounts you want to translate on periodic amounts at the method entry level. For more information, see Entry Level [page 52].

- *Source Amount*
  Specifies the source amount for currency translation, to be used for those accounts that are not specifically set at any entry level.
- *Document Type*
  The document type to be used when posting currency translation results as journal entries. When a model is activated, the document type *01 Currency Translation* is automatically generated by default for currency translation.
- *Rounding Method*
  Specifies the rounding method to be used in this currency translation method. Only active rounding methods can be assigned. For more information, see Rounding Method [page 54].

Entry Level

For each entry, you can define a selection comprised of multiple characteristics that share the same currency translation rule, including currency translation key, exchange rate indicator, source amount, and differential items.

The following settings are made at the entry level:

- *Description*
  Text description of the entry.
- *Characteristic Name*
  A characteristic is used to group a range of accounts using the filter criteria. The defined characteristics are bundled into a selection to apply the same currency translation logic.
- *Currency Translation Key*
  Defines the translation algorithm to be used. For more information, see the relevant section of Currency Translation [page 48].
- *Exchange Rate Indicator*
  The exchange rate to be used for the selection. The value difference incurred in currency translation is posted to the differential item specified at the entry level for accounts with a different exchange rate indicator specified here rather than the reference exchange rate indicator at the method level.
- *Source Amount*
  Specifies the source amount field in currency translation for the selection. During translation, the amount values are taken from the field, and the translated amount is saved in the target amount field.
- *Target Amount*
  Currently fixed to `CONS_SL`, which is used to store the translated amount.
- *Differential Item*
  Defines where the translation differences are to be recorded.
  The translation difference is generated when the selected data is translated using an exchange rate that is different from the reference rate. Such differences can be posted to the source account or to the account number specified here. If you want to post the difference to the source account, leave the differential item account empty.

Example

Example of how the system calculates translation differences:

1. All financial accounts are translated using the reference exchange rate (current rate on translation date: 1.5)

Account	Local currency value	Reference value
1033020	10,000	15,000
1041010	100	150
1042010	400	600

2. The account 1033020 is translated using the exchange rate (1.4) defined at the entry level:

Account	Local currency value	Reference value
1033020	10,000	14,000
1041010	100	150
1042010	400	600

> **i Note**
>
> For account 1033020 (Investments), the system reads the existing group currency value — in this case 14,000 units — from the changes in the investments table.

3. The translation differences are calculated as the difference between the reference value and group currency value.

Account	Reference value	Group currency value	Translation differences
1033020	15,000	14,000	1,000-
1041010	150	150	0
1042010	600	600	0

4. The translation differences are recorded on the defined differential item, in this case, the derived original account 1033020.

Account	Translation indicator	Local currency value	Group currency value
1033020	0	10,000	15,000
1033020	1	0	1,000-
1041010	0	100	150

Account	Translation indicator	Local currency value	Group currency value
1042010	0	400	600

Translation entries should not have any overlaps, otherwise, the method cannot be activated. For any journal entries not explicitly specified at entry level, the translation rule defined at the method level applies.

A translation method generates an AMDP class with the naming convention `/RTCART/C<CLIENT><MODEL><METHOD>`. There are two main methods in the class: `CT_CORE` and `CT_CORE_LOG`. `CT_CORE` runs translation without detail logs, while `CT_CORE_LOG` generates detail logs.

An AMDP method like `CT_CORE` calls the corresponding database procedure with the naming convention `/1BCAMPD/<GUID>.CT.<METHOD>.CT_CORE`. It is in that database procedure where the actual translation rules, which are represented by translation entries, are run in parallel.

1.6.2 Rounding Method

The currency translation of financial data can produce differences caused by rounding in the system. To calculate rounding differences, the system performs rounding checks. Any differences found will then be posted to the appropriate differential items. These differences are usually very small, because they are purely the result of the inaccuracies involved in rounding.

You define rounding methods to combine a set of rules for performing rounding checks and thereafter handling rounding differences.

> **i Note**
>
> Rounding differences are not to be confused with translation differences.

Before rounding is done, the local currency amounts are checked based on your defined rules such as the following with the specified rounding type:

- Total assets = total liabilities and stockholder's equity (rounding type: *Selection 1 = Selection 2*)
- Total revenue + total expense = annual net income (*Selection 1 + Selection 2 = 0*)
- Amortization/depreciation in the balance sheet = amortization/depreciation in the income statement

After passing the check, rounding is performed for the group currency amounts again based on the same rules.

> **i Note**
>
> The validation checks are only performed on the local currency amounts; while rounding differences in the group currency amount are not subject to the same checks.

You define rounding methods in Customizing for *Financial Accounting* under *Real-Time Consolidation* *Currency Translation Definition* *Define Rounding Methods*. Alternatively, use transaction code `RTCRM`. Afterwards, you need to assign the defined rounding method to currency translation methods.

Method Level

The following fields are included at the method level:

- *Status*
  The status of the rounding method is displayed beside the *Rounding Method* field. The method can only be used when its status is *Active*. When saving a method without activating, the method has the status *Inactive*.
- *Description*
  Text description of the rounding method.

A method can be comprised of multiple entries using different rounding check types.

Entry Level

In the system, you can choose the *Rounding Type* from the following three options and assign it to each entry:

- *Selection 1 = 0*
  The group amount of the accounts in selection 1 must balance so that it is equal to 0. If it is not equal to 0, the value of the difference is posted to the differential item. You can use this rounding type to check that total assets equal total liabilities and equity, for instance. In other words, whether the total of all balance sheet items equals zero.
- *Selection 1 + Selection 2 = 0*
  The group amount of accounts in selection 1 plus the group amount of accounts in selection 2 must be equal to 0. If it is not equal to 0, the value of the difference is posted to the differential item. You can use this to check that the group amount of retained earnings is equal to the group amount of net income after currency translation.
- *Selection 1 = Selection 2*
  The group amount of the accounts in selection 1 must be equal to the group amount of the accounts in selection 2. If they are not equal, the value of the difference is posted to the differential item. You can use this rounding type to check if accumulated depreciation in the balance sheet matches the depreciation expense in the income statement after currency translation, for instance.

For each entry, you need to further define:

- The selections comprised of characteristics and their associated filter criteria, depending on the round type you choose.
- The differential items, in other words, the field name in the universal journal into which rounding differences are posted.

For more information on the selections, see the relevant section in Currency Translation [page 48].

1.6.3 Entering Historical Investment/Equity Data

To enter your historical data relating to investments and equity, from the *SAP Easy Access* menu, choose *Accounting* > *Real-Time Consolidation* > *Periodic Processing* > *Maintain Investment/Equity History Data* (or use transaction `RTCAFD`).

Prerequisites

To use the program, you must have the necessary authorizations. The relevant authorization object is `F_RTCAFD`.

For investments, the investor entity (specified in the *Entity* field) and investee entity (specified in the *Partner Entity* field) must belong to the same model.

For equity, only the investee entity (specified in the *Entity* field) is mandatory, and it must exist in the specified model.

Activities

On the initial selection screen, you can choose the entity and fiscal period for which you want to display or change the investment or equity data, which is also referred to as *Additional Financial Data* (AFD). On the detail screen for either investment or equity, the following three additional buttons are available:

- *Display <-> Change*
- *Reconciliation*: Displays investment or equity amounts from FI documents and the amounts manually entered for the specified fiscal period and entity for your comparison. The yellow traffic light indicates a data discrepancy, for which you need to make adjustments as necessary.
- *Check*: Check the input and display any resulting errors.

> **i** Note
>
> The *Check* feature only verifies if there are any missing column inputs. It doesn't check if the entered amounts for relevant accounts are balanced, or entered amounts match those in FI documents.

Or, from the initial screen, you can display the year reconciliation report for the specified model, RTC data category, fiscal year, and entity by choosing the *Reconciliation by Year* button. The reconciliation report displays the local currency amounts in FI documents and the local currency amount entered here for each period of the specified year. The amount must be reconciled before running currency translation for the relevant accounts using translation key *03 Using historical amount in investment table* or translation key *04 using historical amount in equity table*.

> **i** Note
>
> *Fiscal Period* is not needed when displaying the year reconciliation reports, and any entered value is not taken into account. However, it is required for displaying or changing investment/equity data.

1.6.4 Method Assignment

You can assign the defined currency translation method to individual entities. This is needed if currency translation takes place before data release.

During consolidation, the rules for currency translation in each entity are determined by the assigned currency translation method. The system checks whether a currency translation method is assigned at the entity level,

and if it is not then the method assigned at the model level is used. If neither the model or entity are assigned a method, an error is triggered.

You assign currency translation methods in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Data Release* > *Assign Currency Translation Method*. The same procedure also applies to rounding method assignment.

1.7 Validation at Source

Validation at source allows local accountants run local validation before the data is released to group accountants. It ensures data quality by controlling at source.

Prerequisites

Data validation in RTC is based on SAP HANA Rules Framework (HRF) and the reusable UI component S/4HANA Attachment Service. You must complete their installation and configuration activities in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Validation* > *Prerequisite Steps*.

Additionally, to use the validation-specific Fiori apps in RTC, you need to make the following configuration settings in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Validation*:

- Define control levels
- Define number ranges for validation rules
- Define validation method parameters

1.7.1 Define Validation Rules

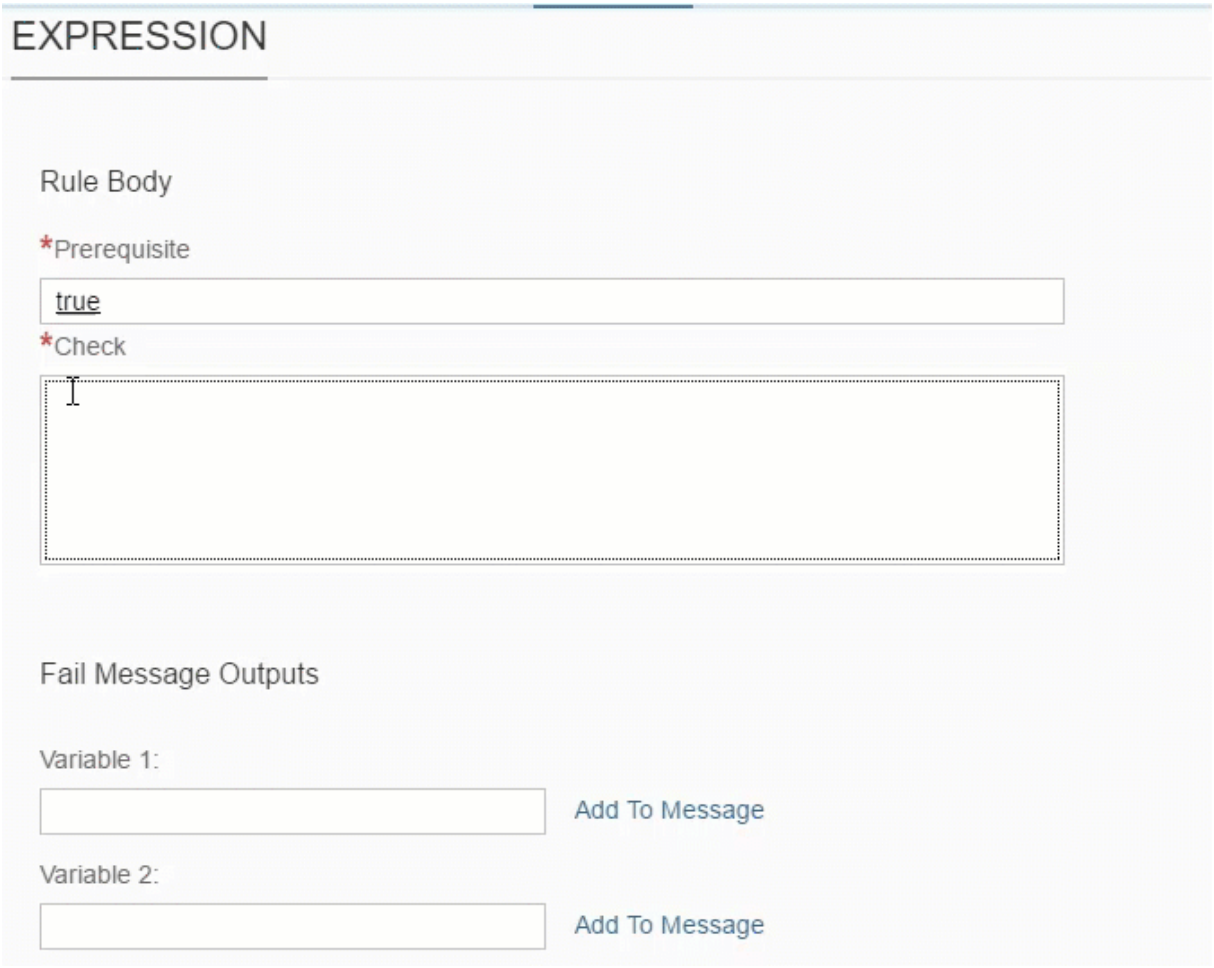
Validation rules need to be defined to ensure reported data is checked based on certain criteria before its release for consolidation. To do that, you launch the app *Define Validation Rules* on the SAP Fiori Launchpad.

Key Features

Create Rule

You can create validation rules to describe the logical conditions that reported financial data should fulfill. The rule expression is defined using the intuitive *Rule Expression Language* (REL), and comprised of data objects and operators.

This is a short demo of defining check conditions (English only).



> **i Note**
>
> For more information, go to the `SAP Rule Expression Language Guide` on the SAP HANA Rules Framework Help Portal page at https://help.sap.com/hrf10, and search for `About the Rule Expression Language`.

You can set the control level of your created rules as *Hard* or *Soft* to specify whether the rule allows an exemption during data validation. Data packages must pass the hard rules before being released for consolidation. Failure to pass soft rules can be exempted with comments.

After a rule is created, you can choose to save the rule as a raw or active version. Furthermore, you can also choose to enable or disable active rules for business use. Only business-enabled rules can be assigned to a validation method and thereafter applied in data checks.

Simulation Run

You can run the created rules for a sample dataset in simulation mode to verify if the rule is set up properly.

Set Up Drill-Through Reports

In this section, you can associate your existing reports with a validation rule. These reports can explain the validation result by enabling drill through to more detailed information.

The associated reports should be accessed via HTTP URLs, and the filtering parameters can be passed through URL parameters. The parameter values can be assigned using placeholders, which are predefined as follows:

1. **`$MODEL$`**: Model
2. **`$VERID$`**: Version ID
3. **`$RYEAR$`**: Fiscal Year
4. **`$POPER$`**: Fiscal Period
5. **`$FISCALYEARPER$`**: Fiscal Year Period
6. **`$ENTITY$`**: Entity

In addition, you can also use any of the four message output placeholders, like **`$1$`**, **`$2$`**, **`$3$`**, or **`$4$`**.

The URL of the drill-through report can either be absolute or relative. If the report app resides in the same host, the relative URL is recommended. For example, you can assign the standard drill-through report to your rule. The report then lists journal entries for a certain consolidation entity. This is an example report URL:

> **Example**
>
> /sap/bc/ui5_ui5/ui2/ushell/shells/abap/FioriLaunchpad.html?sap-client=902#RealTimeConsolidation-showDocumentList?ENTITY=$ENTITY$&FPOPER=$POPER$&FRYEAR=$RYEAR$&MODEL=$MODEL$&RACCT=11121101&VERID=$VERID$

Rule Transport and Mass Activation

In the backend system, for the specified consolidation models, you can transport the created rules to a different system than the source system or activate multiple selected rules.

These functionalities are available in the program *RTC Modeling Tool* (transaction `RTCMD`) under *Utilities* > *Transport Validation Rule/Activate Validation Rule*.

Related Information

App-Specific Implementation Information in the SAP Fiori apps reference library

1.7.2 Define Validation Methods

To verify reported financial data, you need to assign a set of defined rules to a validation method. The validation method can then be assigned to specific entities for checking their reported data. For a specified consolidation model, you can create a validation method and assign it with multiple validation rules, or adjust the rule assignment for an existing validation method. To do that, you need to access the app *Define Validation Methods* on the SAP Fiori Launchpad.

Like validation rules, after creating a validation method, you can choose to activate it or save it as a raw version. Only activated methods are available for assignment and data checks.

Related Information

App-Specific Implementation Information in the SAP Fiori apps reference library

1.7.3 Method Assignment

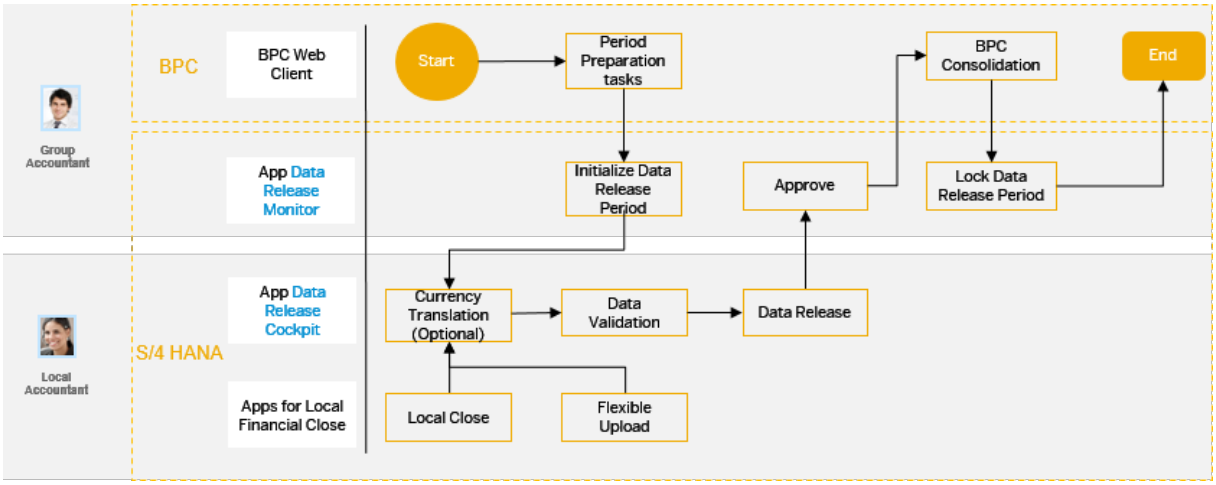
You can assign the defined validation methods to individual entities. This is needed if validation takes place before data release.

You assign validation methods in Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Data Release* > *Assign Validation Method*.

1.8 Data Release

Data release involves processing and transferring local financial data for consolidation use.

A typical data release process is illustrated as follows:



After period data package initialization, local accountants can start data preparation within the Fiori app *Consolidation Data Release Cockpit*. Currency translation and data validation are performed on local reported financial data, based on the defined currency translation methods and validation rules. Only validated data can be released for approval on the group side.

From the Fiori app *Consolidation Data Release Monitor*, group accountants can approve, reject, or defer the released data. Each data release activity generates a data release request (DRR) with a timestamp that indicates the data cut-off time. Multiple DRRs for each entity in each period can be released, but only the latest approved data takes precedence and enters SAP BPC consolidation.

In addition, for subsidiaries that use non-SAP systems for their financial accounting, the *Flexible Upload* program is available for integrating their monthly financial data to the controlled data release process.

For a detailed description of the process and features, see the following sections.

> **i** Note
>
> You can bypass the data release and approval process mentioned above, for example, if you want to run a preliminary consolidation or have the local data automatically released on a regular basis. For more information, see SAP Note 2541326.

1.8.1 Consolidation Data Release Monitor

With this app, group accountants monitor statuses of released data for the specified entities and fiscal period, as well as perform mass actions, such as period initialization, currency translation, data validation, release, deferral, and approval in a sequential order. To ensure correct data processing, the system controls each task by verifying the results of the preceding tasks.

Key Features

Data Status Overview

After specifying the model, version, fiscal period, and optionally the group and entities, you get an overview of the following statuses for each entity:

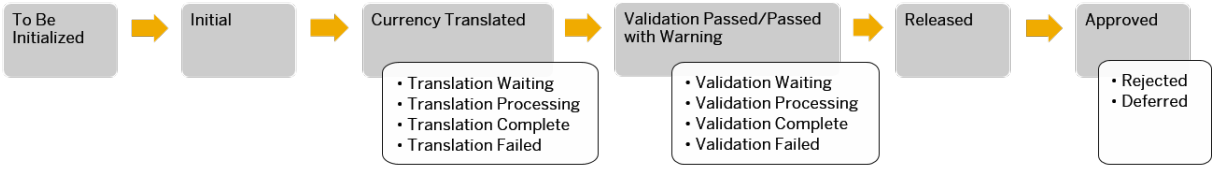
- *Lock Status*: Shows whether the period is still open for data release.
- *Period Status*: Shows the status of the reported data for a timespan from the beginning of the period until the time that it is released.
- *Adjustment Status*: Shows the status of the adjusted data after the last release, that is, which data is undergoing translation, validation, or release phase.
- *New Posting*: Shows if a new posting is detected in the universal journal or through flexible upload, the data of which has not entered the data release cycle.

There are two types of *Data Release Request* (DRR): *Periodic Release Request* (PRR), and *Adjustment Release Request* (ARR), corresponding to the period status and adjustment status respectively.

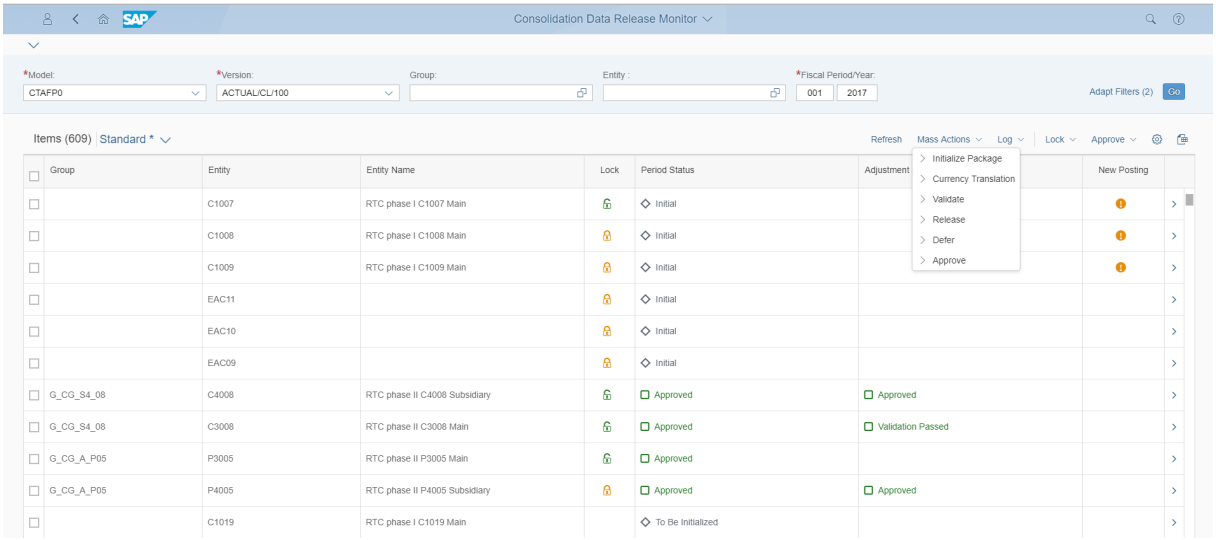
A PRR is mandatory for each entity and each period. If a PRR is missing for an entity in a period, the data is incomplete, and the consolidation process cannot proceed. If a PRR is rejected, then a new PRR is automatically created without initializing the package again. A PRR must be approved for each entity and each period, because only an approved PRR can expose data to the SAP BPC consolidation engine. A PRR cannot be deferred to the next fiscal period; in other words, the journal entries cannot be copied to the next period.

An ARR only takes place if there is a new posting, that is, a data variation in the table `ACDOCA` or `ACDOCC`, after the PRR is approved. Once a new posting is detected, you can run *Currency Translation and Validation* again to include the new changes, and record the timestamp in an automatically-generated ARR. The ARR can then be released. The ARR works the same way as the PRR, except an ARR can be deferred. If deferred, the journal entries posted between the last approved DRR and this ARR are copied to the next period.

Along the data release cycle, reported data can have any of the following statuses illustrated in the figure below:



The figure below is a screenshot of the app that helps you understand the process (English only):



See the sections below for explanations of each step.

Initialize Package

To start collecting data from subsidiaries, group accountants need to open the fiscal period for data release by choosing *Initialize Package* under *Mass Actions* for the specified entities. With that, a PRR is generated and the *Period Status* for the selected entities changes from *To Be Initialized* to *Initial*.

After initialization, subsidiaries can start preparing and releasing their financial data for consolidation. For more information or this follow-on process on the local accountant side, see the section Consolidation Data Release Cockpit [page 65].

> **i Note**
>
> The functions of currency translation, validation, and release are basically the same between *Consolidation Data Release Cockpit* and *Consolidation Data Release Monitor* apps, except they are available in the latter with mass action mode, that is, you can perform the actions for multiple entities.

Currency Translation

Reported financial data in the local and transaction currencies needs to be translated into corresponding amounts in the group currency for consolidation purposes. To do that, choose *Currency Translation* under *Mass Actions*.

If the *Detail Log* checkbox is selected when running currency translation, a detail log is recorded and is available for auditing or other tracking purposes. The log can be accessed from *Log* > *Currency Translation Log*. It

displays the group account number, translation key, exchange rate, source currency, source amount, target currency, and translated amount for each entity.

For information on the currency translation method, see the section Currency Translation Method [page 50].

Validation

Before releasing data for group consolidation, translated financial data needs to be validated against the defined rules. To do that, choose *Validate* under *Mass Actions*.

If validation fails, you can view its details by choosing the arrow icon (>) of each entity record to navigate to the app *Consolidation Data Release Cockpit*. Under *Validation*, you can check which validation rule the data fails to meet.

For more information, see the section Consolidation Data Release Cockpit [page 65].

Release Data

Following a successful currency translation and validation, you can proceed to releasing the data. To do that, choose *Release* under *Mass Actions*.

Approve

As a group accountant, you have the option to approve or reject the released data.

> **i Note**
>
> When you choose any option under *Mass Actions*, the system triggers the possible preceding tasks sequentially for the selected entities. On the other hand, separate action buttons on the top right of the table, such as *Approve*, *Reject*, and *Defer*, only apply to the data released by local accountants from the *Consolidation Data Release Cockpit* app.

Lock/Unlock

Locking an entity prevents further data release or any data processing, for example, currency translation, validation, and defer. You can choose to lock or unlock selected entities, the *Lock Status* of which changes to *Locked* or *Unlocked* accordingly.

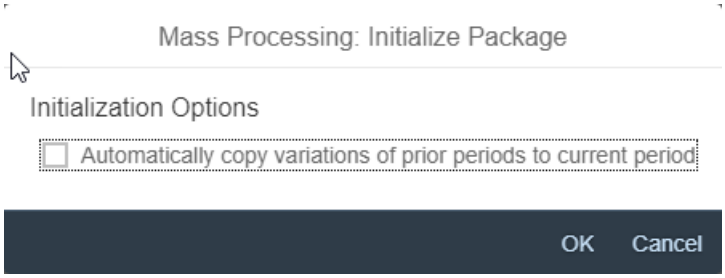
Defer

Generally, the defer action copies the newly-posted adjustment data for prior periods to the current period, or copies the adjustment for current period to the next period, where "adjustment" means the delta changes made since the last approval/defer time till now. The copy operation posts documents into the consolidation journal (`ACDOCC` table), divided by combinations of entity, period, and currency code. The document type is `04` (*Defer from Prior Periods*) with the posting level `03`. Note that a posting level less than or equal to `09` refers to local data, which needs to be released in *Consolidation Data Release Cockpit* by local accountants.

> **i Note**
>
> If the currency translation mode of your consolidation model is set to `1` (*Currency Translation in Accounting*), then in addition to local currency, it also posts documents in the relevant group currencies.

If the adjustments are made to a prior period (by reopening it, for example), a *New Posting* notification appears for the corresponding period in both *Consolidation Data Release Cockpit* and *Consolidation Data Release Monitor* apps. By choosing *Defer* under *Mass Actions*, you can defer the new postings into the next period that is not initialized or processed yet. When you initialize the next available period in *Consolidation Data Release*

Monitor, the following dialog pops up, asking whether you want to defer the variations of prior periods to current period.



If you choose *OK*, all these new postings of prior periods are copied into current period.

Apart from the data copy operation, it also creates an ARR for each prior period that has variations. The deferred ARR has *Deferred* status and is recorded in the corresponding deferral document. When checking data through the BPC virtual InfoProvider, you will not see the new postings in their original periods, but in the deferral target period. This is achieved by using only the timestamp of latest approved DRR as the filter for the prior periods. Therefore, the deferred/rejected DRRs are not counted in. In this way, the data is consistent among periods from the consolidation point of view.

There are some constraints for the deferral action, though:

- You can only defer changes to a target period that is either not initialized or not processed, meaning no currency translation or validation is executed yet. When you choose the deferral action, the system automatically helps you find the next available period for deferring to.
- You can only defer changes for a period that is not the last period based on your fiscal year variant (FYV). For example, if your model has the FSV `K4` (*Calendar Year, 4 Special Periods*), you cannot defer the changes for the period `16`.
- You cannot defer the full-period data, that is, you cannot defer PRRs. It is required for each period to get its PRR approved. After its approval, all the subsequent data releases are recorded in ARRs, which are deferrable.
- If you deferred any ARRs in the current period, but when a later change comes in and you approve it, the system cancels all the previous deferred ARRs and marks the posted deferral documents as deleted.

> Information sap-icons code Information
>
> The main reason that the year-to-date (YTD) model is superior to the period model is that the YTD model automatically counts the adjustments of prior periods into current period during data collection.
>
> As the Real-Time Consolidation solution is based on accounting (FI) data, which is period model-based, the **Deferral** concept is introduced to cope with the adjustments for the prior periods. With the ARRs organized in chronological order, deferral is more convenient than submitting YTD data. You can easily trace back to know when the changes take place.

For external entities that don't have their accounting in SAP S/4HANA and first need to upload the data into `ACDOCC` table by periods, they can upload the data again for the changed periods. The *Consolidation Data Release Cockpit* then displays the *New Posting* notification for the changed period. You can defer them just like for internal entities.

> **i Note**
>
> This app replaces the following transaction codes that are available in SAP S/4HANA 1610 and become obsolete from SAP S/4HANA 1709 onwards:
>
> - `RTCDSRB`: Data Submit Requests in Batch
> - `RTCMPL`: Mass Period Lock
> - `RTCRL`: Data Submit Request List
> - `RTCPL`: Pull Request - Period Lock/Unlock
>
> Refer to SAP Note 2569477 to disable the transaction codes in the back-end systems.

More Information

- The SAP Fiori apps reference library has details about the content necessary for giving users access to an app on the SAP Fiori launchpad. The SAP Fiori apps reference library is available here: https://fioriappslibrary.hana.ondemand.com
  To see this app's Fiori content, search for the app. Then select SAP S/4HANA as the product. On the Implementation Information tab, select the correct release. The details are in the Configuration section.
- It is also mandatory to check this document for more implementation information: .

1.8.2 Consolidation Data Release Cockpit

With this app, local accountants can view, verify, and release financial data for the specified model and entities. Based on the status of the last released data, the system controls whether currency translation (optional), validation, and release is possible for new posting data, and displays the released and to-be-released amount in both the local currency and the group currency. Data release history can be retrieved for comparison purposes.

Compared with the app *Consolidation Data Release Monitor*, *Consolidation Data Release Cockpit* is aimed at local accountants. It provides the data and its statuses from the perspective of individual entities. Group accountants can also navigate to this app from the *Consolidation Data Release Monitor*.

Key Features

Data Status Overview

After specifying the model and optionally the version, entities, and fiscal period range, you get an overview of the following statuses for each entity:

- *Lock Status*: Shows whether the period is still open for data release.
- *Period Status*: Shows the status of the reported data for a timespan from the beginning of the period until the time that it is released.
- *Adjustment Status*: Shows the status of the adjusted data after the latest release, that is which data is in the translation, validation, or release phase.

- *New Posting*: Shows if a new posting is detected in the universal journal or through flexible upload, the data of which has not yet entered the data release cycle.

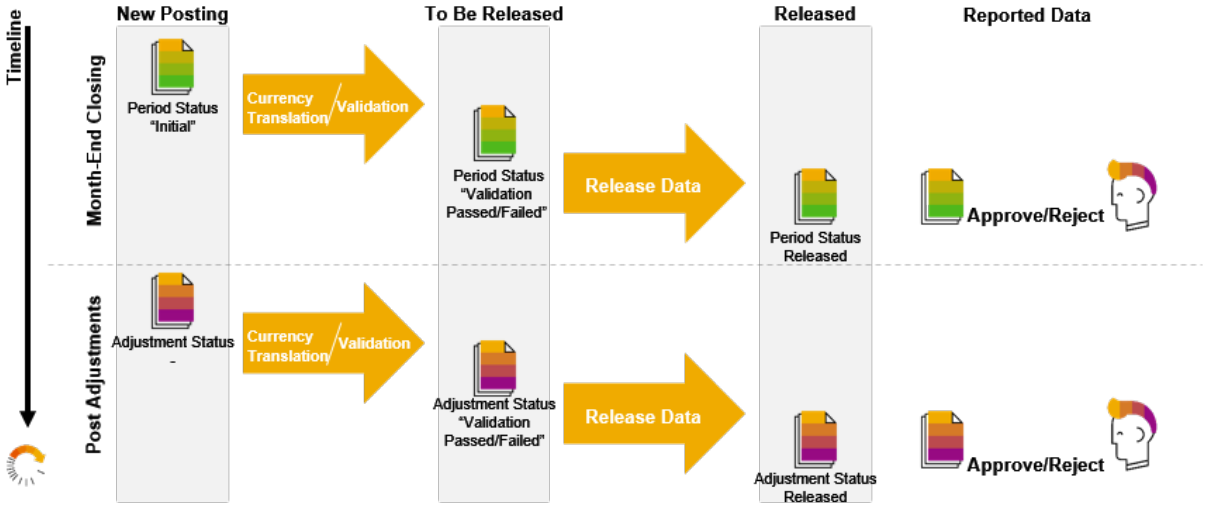
Reported Data in Detail

For a specified fiscal period, the table *Reported Data* displays the data reported within different timespans and therefore with various statuses. The table contains the following columns or settings:

- *LC/GC Opening*: The amount in period `000`. This amount is not the amount carried forward in accounting, but the amount carried forward by the consolidation transaction to the consolidation table `ACDOCC`.
- *LC/GC New Posting*: The amount of journals posted after the latest data release cut-off time.
- *LC/GC To Be Released*: Once the *Currency Translation (optional) and Validation* task for the new posting data is executed successfully, the amount is moved from *New Posting* to this column.
- *LC/GC Released*: Once the *Release* task for the to-be-released data is executed successfully, the amount is moved from *To Be Released* to this column.
- *LC/GC YTD*: The sum of *Opening* and *Released* amounts for prior periods, and *To Be Released* and *Released* amounts for the current period.
- *Display Group Currency*: If a group currency amount with a posting level equal to or lower than `09` exists, data can be displayed in your selected currency.

> **i Note**
>
> *LC* and *GC* stand for local currency and group currency respectively.
>
> The hierarchy of financial accounts in the table is defined as *Financial Statement Version* (transaction code `OB58`), and assigned to the combination of model, ledger, and entity in transaction *Method Assignment* (transaction code `RTCMA`).

In general, when documents are posted for an entity, the system checks if the data can be validated and translated. If not, the newly-posted data is represented as a *New Posting* in the table. Otherwise, the newly-posted data is merged with the most recent data in the validation and the optional translation process, and the merged data is shown as the *To Be Released* amount. Once it is released, the data is displayed as *Released*. The status change of the amounts displayed for reported data described above is illustrated in the following figure:



> **i Note**
>
> When expanding to account item level, you have the option to drill through to the original journal entries in the consolidation table (ACDOCC).

Run Currency Translation (Optional) and Validation

Before releasing data for group consolidation, the reported financial data of each entity needs to be validated against the defined rules, and translated into group currency if configured accordingly. After choosing *Run Translation and Validation*, a background job is triggered and lined up in the system job queue. You can choose *Log* > *Background Job Log* or *Currency Translation Log* to check the details log.

If validation fails, you can view its details under *Validation* to check which validation rule the data fails to meet.

The *Status* column shows whether the reported data has passed the rule check. Failed validation is followed by an explanation in the *Rule Result* column, which was defined as *Fail Message Outputs* when setting up the rules in the Fiori app *Define Validation Rules*.

For any rule of your interest, you can run validation with the latest data in simulation mode using the button *Simulation*.

To get more insights on the validation results, you can choose *Show Extra Columns* on the top right corner of the table, so that you can navigate to drill-through reports defined when setting up rules, add comments when validation against a soft rule fails with exemption, or add an attachment for further explanation.

Release

Following a successful data validation, you can release the data for approval.

The *Release History* lists all your data releases and their statuses within the specified fiscal period. You can choose any two releases to compare the value differences of each accounting entry in the local and group currencies.

Reverse

You have the option to reverse your last released data, the status of which will be changed to the preceding status *Validation Passed*, and data is moved from the *Released* column to the *To Be Released* column in the *Reported Data* table.

> **i Note**
>
> This app replaces the following transaction codes that are available in SAP S/4HANA 1610 and become obsolete from SAP S/4HANA 1709 onwards:
>
> - `RTCDSR`: Raise Data Submit Request
> - `RTCRL`: Data Submit Request List
> - `RTCPL`: Pull Request - Period Lock/Unlock
>
> Refer to SAP Note 2569477 to disable the transaction codes in the back-end systems.

More Information

- The SAP Fiori apps reference library has details about the content necessary for giving users access to an app on the SAP Fiori launchpad. The SAP Fiori apps reference library is available here: https://fioriappslibrary.hana.ondemand.com
  To see this app's Fiori content, search for the app. Then select SAP S/4HANA as the product. On the Implementation Information tab, select the correct release. The details are in the Configuration section.
- It is also mandatory to check this document for more implementation information: .

1.8.3 Flexible Upload

Subsidiaries using the SAP system have their accounting data synchronized to the consolidation table in real time. For subsidiaries that use non-SAP systems for their financial accounting, the *Flexible Upload* program is available to integrate their monthly financial data to the consolidation journal (table `ACDOCC`).

This program can be accessed from the *SAP Easy Access* screen by choosing *Accounting* > *Real-Time Consolidation* > *Periodic Processing* > *Flexible Upload* (or use transaction code `RTCFU`).

Flexibly uploaded data is submitted using a spreadsheet template. To download the required template, in the *Flexible Upload* program, you must first enter a model and choose *Download Template*.

When filling out the template, all fields marked with *Mandatory* should be filled with values. You should then save it as CSV file format.

> **i Note**
>
> Make sure values are separated by semicolons (";").

To upload the completed file, specify a model, data category, and a fiscal year and period, then choose *Upload Document*.

> **i Note**
>
> The *Flexible Upload* program now supports uploading data for multiple entities by adding multiple rows in one spreadsheet template.

The system generates documents with document type *00 Flexible Upload* for each entity, if the Excel file includes data from multiple entities.

Each upload of data for a specific entity is treated as a full data upload, while the later posting for a specific entity is incremental posting.

> **Example**
>
> To upload data for entity `C1001` with account `11112001` and amount 200 USD.
>
> As shown in the table, the data was entered as 100 USD in the first upload, and is corrected by the second upload, adding up to 200 USD.

Document Type	Document Number	Entity	Account	Amount	Description
00	100000001	C1001	11112001	100 USD	First upload
00	100000002	C1001	11112001	100 USD	Second upload

> **i Note**
>
> The system behavior of balance check is changed for the SAP-delivered document type *00 Flexible Upload*. In the SAP S/4HANA 1610 release, the system performs a balance check and sends warning messages if there is an imbalance in the local currency amounts found during file upload. In the 1709 release, system does not check for an imbalance in the amounts during file upload.

Initial Upload

The *Initial Upload* program is available as a special upload for entities switching to the Real-Time Consolidation system. It is used to upload the initial data set and therefore includes different fields from the periodical *Flexible Upload*.

In the initial upload template, data in local and group currencies should be separated into several rows according to the currency codes. The system treats the rows with amounts entered in `HSL` (Local Currency) as local data inputs, ignoring any other amount inputs in the same row. The group currency amounts should be maintained in other rows with inputs in `KSL` (Global Currency), while keeping the `HSL (Local Currency)` field empty.

The default document type for initial upload is *06 Initial Upload for Consolidation System Cutover*, and this skips the data release process. You can also define your own document types if you want to have customized process control.

> **i Note**
>
> To get the initial data, you must first upload the data to the last period of the prior year, and then run balance carryforward in SAP Business Planning and Consolidation (SAP BPC). For example, if a new subsidiary enters in period 006 of year 2018, you should upload the data to period 012 of year 2017. After that, carry forward the data to the opening period 000 of year 2018 in SAP BPC.

This program can be accessed from Customizing for *Financial Accounting* under *Real-Time Consolidation* > *Preparation for Productive Start* > *Initial Upload of Consolidation Documents* (or use transaction code `RTCFUI`).

1.9 Reports

1.9.1 Drill-Through Reports

This app is available on the *SAP Fiori Launchpad*. With this app, you can display a list of journal entries for the specified consolidation model and cut-off time, or drill through from the account line item of reported data in the app *Consolidation Data Release Cockpit* to its original financial journal entries. Usually, amounts are displayed in various currencies on entity and group account level.

Additionally, if when defining the validation rules, you set up the path of the drill-through report using the relevant variables, such as model, version, fiscal period, and entity, in the validation result part of the app *Consolidation Data Release Cockpit*, you can directly navigate to the journal entry list view in the app *Drill-Through Reports* with the variables derived from the validation rules.

> **i** Note
>
> If currency translation takes place in the consolidation system rather than the financial accounting system, within the reported financial data view, only local currency amounts can be drilled through to the journal entry level, while group currency amounts cannot be traced backed due to the irreversible currency translation route.

More Information

- The SAP Fiori apps reference library has details about the content necessary for giving users access to an app on the SAP Fiori launchpad. The SAP Fiori apps reference library is available here: https://fioriappslibrary.hana.ondemand.com
  To see this app's Fiori content, search for the app. Then select SAP S/4HANA as the product. On the Implementation Information tab, select the correct release. The details are in the Configuration section.
- It is also mandatory to check this document for more implementation information: .

1.9.2 Display Consolidation Documents

The following two transactions are available to display consolidation documents:

- *Display Consolidation Document* (transaction `RTCJD`)
  You use this report to list the consolidation data of a specified document number in the consolidation journal (table `ACDOCC`). The report provides subtotals in the *Amount in Company Code Currency* and *Amount in Group Currency* fields, grouped by the *Group Account Number* field.
- *Display Consolidation Document List* (transaction `RTCDL`)
  You use this report to display a list of posted consolidation documents based on the selection criteria. From this list, you can also navigate to the details of individual documents, namely to the report *Display Consolidation Document* (transaction `RTCJD`), by choosing to display the details of a document from the results list.

> **i Note**
>
> These two transactions are also available in *SAP Fiori Launchpad* as Fiori apps with names same as the corresponding transactions.

1.9.3 Define Your Own Reports

In addition to the out-of-the-box reports described above, you also have the option to define your own reports using various reporting tools and data sources, for example, by using S/4HANA Embedded Analytics or SAP BusinessObjects Analysis for Microsoft Office (the EPM Add-In).

S/4HANA Embedded Analytics

With real-time access to the transactional data coming from S/4HANA system, S/4HANA Embedded Analytics enables users to build multidimensional reports by using the analytical tools that consume **Core Data Services** (CDS views).

The below example procedure demonstrates how to create the analytical CDS views based on the generated consolidation views, customize queries, and view the queries in the analytical application *Query Browser*.

1. Create a dimension view based on G/L accounts (mapped to financial statement items). In our case, the relevant CDS view is the generated consolidation view */RTCART/<MODEL>_FSI*. This is the sample code block for defining a master data view for G/L accounts:

```
@AbapCatalog.sqlViewName: 'ZVINCE5F'
@AccessControl.authorizationCheck: #NOT_REQUIRED
@EndUserText.label: 'Account Master Data View'
@Analytics.dataCategory: #DIMENSION
@ObjectModel.representativeKey: 'Account'
define view ZVINCE5_FSITEM
  as select from /RTCART/VINCE5_FSI
{
  key CHARTOFACCOUNTS       as CoA,
  key GLACCOUNT             as Account,
      ISBALANCESHEETACCOUNT as isBalanceSheetAccount,
      GLACCOUNTGROUP        as GLAccountGroup,
      PROFITLOSSACCOUNTTYPE as ProfitLossAccountType,
      SAMPLEGLACCOUNT       as SampleGLAccount,
      PARTNERCOMPANY        as PartnerCompany,
      FUNCTIONALAREA        as FunctionalArea,
      GLACCOUNTTYPE         as GLAccountType,
      GLACCOUNTEXTERNAL     as GLAccountExternal,
      ISPROFITLOSSACCOUNT   as isProfitLossAccount,
      ELIMINATIONACCOUNT    as EliminationAccount,
      ENABLEJOURNAL         as EnableJournal,
      ELIMINATIONTYPE       as EliminationType,
      EXCHANGERATETYPE      as ExchangeRateType,
      BPCACCOUNTTYPE        as BPCAccountType
}
```

   Note that the two annotations `@Analytics.dataCategory: #DIMENSION` and `@ObjectModel.representativeKey: 'Account'` are used to indicate the view is a master data dimension view with the representative key *Account*.

Similarly, you can create a similar dimension view for *Entity* dimension based on the generated consolidation view */RTCART/<MODEL>_ENTITY*.

2. Create a cube view for all consolidation data. In the example, we pick view */RTCART/<MODEL>_U00* as the fact view, which has the input parameters *Data Category*, *Consolidation Ledger*, *Variant*, *Fiscal Year*, *Fiscal Period*, and *Cut-off Timestamp*. It returns current period data and approved data for prior periods so that you can get the year-to-date (YTD) consolidated data for a specific consolidation version. This is the sample code block for defining an analytical cube view for YTD consolidated data:

```
@AbapCatalog.sqlViewName: 'ZVINCE5C01'
@AccessControl.authorizationCheck: #NOT_REQUIRED
@EndUserText.label: 'Consolidation Version Specific Year-To-Date Cube'
@Analytics.dataCategory: #CUBE
define view ZVINCE5_CUBE
 with parameters p_rtc_catg : rtc_dcat,
                 p_acctp : rtc_acctp,
                 p_rvers : rtc_rvers,
                 p_ryear : ryear,
                 p_poper : poper,
                 p_timestamp: timestamp
as select from /RTCART/VINCE5_U00(
                 p_rtc_catg:$parameters.p_rtc_catg,
                 p_acctp:$parameters.p_acctp,
                 p_rvers:$parameters.p_rvers,
                 p_ryear:$parameters.p_ryear,
                 p_poper:$parameters.p_poper,
                 p_timestamp: $parameters.p_timestamp)
 association [1..1] to ZVINCE5_ENTITY   as _Entity  on $projection.Entity
=_Entity.Entity
 association [1..1] to ZVINCE5_ENTITY   as _Pentity on
$projection.PartnerEntity =_Pentity.Entity
 association [1..1] to ZVINCE5_FSITEM   as _Account on $projection.CoA
=_Account.CoA
                                                    and $projection.Account =
_Account.Account
 {
    @ObjectModel.foreignKey.association: '_Entity'
    key ENTITY as Entity,
    key FISCYEARPER as FiscalYearPeriod,
    key KTOPL as CoA,
    @ObjectModel.foreignKey.association: '_Account'
    key RACCT as Account,
    key RMVCT as TransactionType,
    @ObjectModel.foreignKey.association: '_Pentity'
    key PENTITY as PartnerEntity,
    key AUDIT_TRA as BPCAuditTrail,
    @Semantics.currencyCode: true
    key CONS_CUR as Currency,
    @Semantics.amount.currencyCode: 'Currency'
    @DefaultAggregation: #SUM
    CONS_SL as Amount,
    _Entity,
    _Pentity,
    _Account
}
```

Note that the annotation `@Analytics.dataCategory: #CUBE` is key to indicate this is a cube view. You can associate dimension views to a cube.

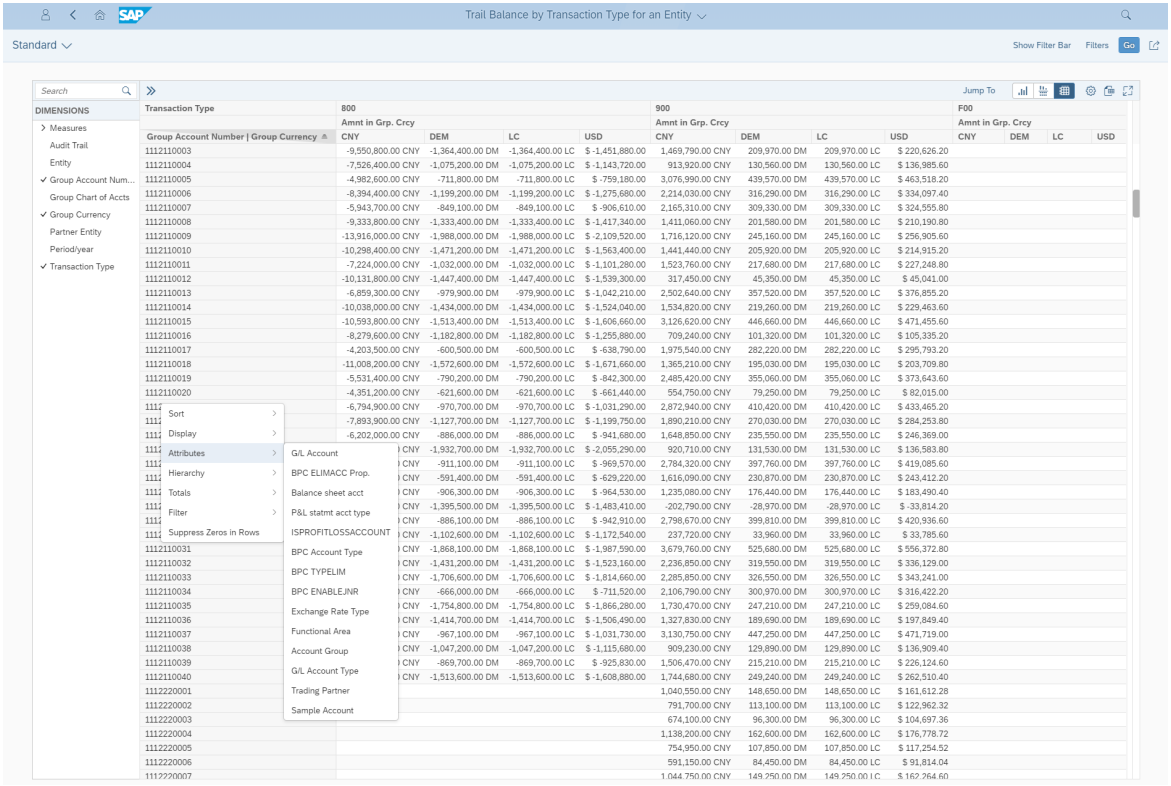
3. Create a query based on the cube. This is required because only queries can be consumed by S/4HANA analytical applications, for example the app *Query Browser*.
This is the sample code block for defining a trail balance query by transaction types for an entity:

```
@AbapCatalog.sqlViewName: 'ZVINCE5Q01'
@AccessControl.authorizationCheck: #NOT_REQUIRED
```

```
@Analytics.query: true
@OData.publish: true
@EndUserText.label: 'Trail Balance by Transaction Type for an Entity'
define view ZVINCE5_QUERY
 with parameters p_rtc_catg : rtc_dcat,
                 p_acctp : rtc_acctp,
                 p_rvers : rtc_rvers,
                 p_ryear : ryear,
                 p_poper : poper,
                 p_entity : rtc_entity,
                 @Consumption.defaultValue: '99991231000000'
                 p_timestamp: timestamp
as select from ZVINCE5_CUBE(
                 p_rtc_catg:$parameters.p_rtc_catg,
                 p_acctp:$parameters.p_acctp,
                 p_rvers:$parameters.p_rvers,
                 p_ryear:$parameters.p_ryear,
                 p_poper:$parameters.p_poper,
                 p_timestamp:
$parameters.p_timestamp)
{
    Entity,
    FiscalYearPeriod,
    CoA,
    @AnalyticsDetails.query.axis: #ROWS
    Account,
    @AnalyticsDetails.query.axis: #COLUMNS
    TransactionType,
    @EndUserText.label: 'Partner Entity'
    PartnerEntity,
    BPCAuditTrail,
    @AnalyticsDetails.query.axis : #ROWS
    Amount,
    @AnalyticsDetails.query.axis: #COLUMNS
    Currency
} where Entity = :p_entity
```

Note that the annotation `@Analytics.query: true` indicates this is a query CDS view. If you want to have the query be consumed by Smart Business KPIs applications or analytical apps based on Analysis Path Framework (APF), you should annotate `@OData.publish: true`. In this way, an OData service with naming convertion *<CDSViewName>_CDS* will be generated. After that, you must manually register the service via transaction */IWFND/MAINT_SERVICE*.

4. Now, you can access the query directly by using the S/4HANA analytical applciation *Query Browser*. The required business role is `SAP_BR_EMPLOYEE`.
   The figure below is a screenshot of the query *Trial Balance by Transaction Types for an Entity* (English only):



For more information, see .

SAP BusinessObjects Analysis for Microsoft Office

SAP BusinessObjects Analysis for Microsoft Office is an MS Office add-in that allows multidimensional ad-hoc analysis in MS Excel and creation of BI presentations in MS PowerPoint with data sources including SAP NetWeaver BW and *SAP HANA*.

To define your own reports, follow this basic procedure:

1. Build SAP BW queries on the CompositeProvider that you have defined for the Real-Time Consolidation model.
2. Open Microsoft Excel with the analysis add-in installed.
3. Under the tab *EPM* of Microsoft Excel, log on to your SAP system and open the query.

For more information, go to the `EPM Plug-in User Guide` on the SAP BusinessObjects Analysis for Microsoft Office Help Portal page at https://help.sap.com/boaa.

1.10 Data Archiving in Real-Time Consolidation

Data archiving is used to remove mass data from the database that is no longer required in the system but must be kept in a format that can be analyzed. For most of the archiving objects, the SAP data archiving concept is based on the *Archive Development Kit (ADK)*.

In Real-Time Consolidation (RTC), archiving objects RTC_JOURNA and RTC_DRR can be used to archive relevant data.

Activities

The most important actions relating to data archiving take place in *Archive Administration*, which can be accessed by using transaction code SARA.

After entering your archiving object, you can execute the following main steps in *Archive Administration*:

- Choose *Database Tables* to get an overview of the database tables from which the data is archived.
- Choose *Write* to create and store the archive files.
- Choose *Delete* to delete the archived data from the database.
- Choose *Read* to read the archive files.

Related Information

Archiving Consolidation Journals Using RTC_JOURNA [page 75]

Archiving Data Release Requests Using RTC_DRR [page 77]

1.10.1 Archiving Consolidation Journals Using RTC_JOURNA

You can use the archiving object RTC_JOURNA for archiving consolidation journals and their related data, for example, task results and task logs.

ILM-Based Information for the Archiving Object

You can use this archiving object with the RTC_JOURNA ILM object as part of SAP Information Lifecycle Management.

The following fields for RTC_JOURNA are defined in the ILM policy and are visible when processing the *ILM Policies* app:

- Available Time References
  - Posting Date (POSTING_DATE)
- Available Condition Fields
  - Model (MODEL)

    - Fiscal Year `(RYEAR)`
- Available Policy Categories
    - `RST`: Residence Rules
    - `RTP`: Retention Rules

Defining Write Variants

When you schedule the archiving run, you need to enter an existing variant or create a new one. You can do so in the *Write* program of *Archive Administration* (transaction code SARA).

The variant contains the selection criteria for the consolidation journals that you want to archive.

You can select the consolidation journals to be archived using the following criteria:

- Model
- Version ID
- Fiscal Year
- Posting Period

The system also shows the *ILM Actions* frame. You can use these actions to archive consolidation journals with the retention periods defined in the *Information Retention Manager*. Furthermore, you can take snapshots (make copies) of data or destroy data that satisfies the prerequisites. For more information, see

Displaying Consolidation Journals Archived with RTC_JOURNA

You use the read program `RTC_JOURNA_READ_AR_SEQUENTIAL` to display archived data as follows:

1. On the *Archive Administration: Initial Screen* (transaction `SARA`), enter the name of the archiving object `RTC_JOURNA` in the *Archiving Object* field.
2. Choose *Read*.
   The *Archive Administration: Run Read Program* screen appears. The *Background/Dialog* field is preset with "*Dialog*". Select the read program, and choose *Execute*.
3. Specify the following selection criteria to search for archived consolidation journals and choose *Execute*:
    - Model
    - Version ID
    - Fiscal Year
    - Posting Period
4. The *Archive Administration: Select Files for Read Program* dialog box appears. Select the archive files that you want to read or analyze and then confirm your selection by choosing *Continue*.
5. The system outputs a summarized list of the consolidation journals corresponding to the selection criteria.

1.10.2 Archiving Data Release Requests Using RTC_DRR

You can use the archiving object `RTC_DRR` for archiving data release requests and their related data, for example, period locks, validation results, and comments.

ILM-Based Information for the Archiving Object

You can use this archiving object with the `RTC_DRR` ILM object as part of SAP Information Lifecycle Management.

The following fields for `RTC_DRR` are defined in the ILM policy and are visible when processing the *ILM Policies* app:

- Available Time References
  - Release Date `(RELEASE_DATE)`
- Available Condition Fields
  - Model `(MODEL)`
  - Fiscal Year `(FYEAR)`
- Available Policy Categories
  - `RST`: Residence Rules
  - `RTP`: Retention Rules

Defining Write Variants

When you schedule the archiving run, you need to enter an existing variant or create a new one. You can do so in the *Write* program of *Archive Administration* (transaction code SARA).

The variant contains the selection criteria for the data release requests that you want to archive.

You can select the data release requests to be archived using the following criteria:

- Model
- Version ID
- Fiscal Year
- Fiscal Period

The system also shows the *ILM Actions* frame. You can use these actions to archive consolidation journals with the retention periods defined in the *Information Retention Manager*. Furthermore, you can take snapshots (make copies) of data or destroy data that satisfies the prerequisites. For more information, see

Displaying Consolidation Journals Archived with RTC_JOURNA

You use the read program `RTC_DRR_READ_AR_SEQUENTIAL` to display archived data as follows:

1. On the *Archive Administration: Initial Screen* (transaction `SARA`), enter the name of the archiving object `RTC_DRR` in the *Archiving Object* field.
2. Choose *Read*.
   The *Archive Administration: Run Read Program* screen appears. The *Background/Dialog* field is preset with "*Dialog*". Select the read program, and choose *Execute*.
3. Specify the following selection criteria to search for archived consolidation journals and choose *Execute*:
   - Model
   - Version ID
   - Fiscal Year
   - Fiscal Period
4. The *Archive Administration: Select Files for Read Program* dialog box appears. Select the archive files that you want to read or analyze and then confirm your selection by choosing *Continue*.
5. The system outputs a summarized list of the consolidation journals corresponding to the selection criteria.

1.11 Migration from SAP S/4HANA 1610 or 1709

In Real-time consolidation (RTC), compared with SAP S/4HANA 1709 FPS02 and lower releases, the release 1809 supports Zero Downtime Option of SUM (ZDO) by replacing SAP HANA repository with SAP HANA Deployment Infrastructure (HDI) container, which comes along with improved system performance. After upgrading to 1809 release, the following data migration procedures must be performed to ensure your existing RTC models and their foundation views, generated consolidation views, and the views for BW virtual InfoObjects are compatible with HDI.

> **i Note**
>
> SAP S/4HANA 1709 FSP03 is equivalent to 1809 from functionality perspective. Therefore, the procedures also apply to the migration from lower releases to 1709 FPS03.

Migrating from 1709, 1709 FPS01, or 1709 FPS02

1. Create an HDI container for the foundation views and an HDI container for generated consolidation views by using the *ABAP-MANAGED HDI Containers* (`SCTS_AMHC`) transaction.
2. Create a HDI namespace in ABAP Development Tools (ADT). This automatically creates a project in SAP Web IDE, so that you can create HDI views within the project in Web IDE.
3. Open your new HDI namespace in Web IDE, and migrate your old HANA repository foundation views to the HDI foundation view container by using the *Import* feature in Web IDE.
4. Switch to HDI foundation views in the *RTC Modeling Tool* (`RTCMD`) transaction as follows:
   1. Open the relevant model.
   2. In the *Basic* tab, specify the *Logical HDI Container for Generated Views* you created in step 1 and the *Namespace for HDI Objects* you created in step 2.
   3. In the *Data Source* tab, specify the *Logical Container for Foundation Views* you created in step 1 and the *Namespace for HDI Objects* you created in step 2, for each data stream of all data categories. If your foundation view names are not changed, leave them as they are.

4. Activate the model.

5. Run `RTC_SELECTION_MIGRATION` report in *ABAP: Program Execution* (`SA38`) transaction. And then re-activate the RTC translation methods and rounding methods by using the respective transactions (`RTCTM` and `RTCRM`).
6. In the *Data Warehousing Workbench: Modeling* (`RSA1`) transaction, switch from your old HANA view (`RTC_C_<CLIENT><MODEL>_BPCUNION`) to the new HDI union view (`RTC_C_<MODEL>_BPCUNION`). Update the *Package* to that contains the right *HDI Namespace* as a prefix, for example, `SAPS4H_RT_5787.sap.erp.sfin.rtc`. Then activate the BW virtual InfoProvider.
7. In the BW Modeling Tool (Eclipse-based), choose the *SAP HANA Package* that contains the right HDI container and namspace information, for example `SAPS4H_RT_5787.sap.erp.sfin.rtc`. Choose the right SAP HANA view under the namespace. Activate the InfoObject.

> **i Note**
>
> All above steps are relevant to BPC-integrated RTC models. For RTC models that are not integrated with BPC, you only need to re-activate the models and perform the step 5.

For the detailed step-by-step guide on migrating RTC models from the release 1709, 1709 FPS01, or 1709 FPS02 to 1709 FPS03 or 1809, see SAP Note 2643245.

Migrating from 1610

If you have Real-Time Consolidation (RTC) models defined in the SAP S/4HANA 1610, and you upgraded from 1610 to 1709 FPS03 or 1809, you must first follow the migration procedure described in SAP Note 2511678 (Migrate 1610 Real-time Consolidation Models to 1709), and then perform the above steps.

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