



ADMINISTRATION GUIDE | PUBLIC
Document Version: 1.2 – 2019-11-15

SAP Customer Activity Repository 4.0 FPS02 Administration Guide

Content

- 1 Getting Started. 6**
- 1.1 Naming Conventions. 7
- 1.2 Introduction to SAP Customer Activity Repository. 9
- 1.3 Overall System Landscape. 15
- 2 Security. 16**
- 2.1 Why is Security Necessary?. 16
- 2.2 Security Aspects of Data, Data Flow and Processes. 17
- 2.3 User Administration and Authentication. 20
- 2.4 Authorizations. 23
 - Authorization Requirements for SAP Customer Activity Repository (Including Demand Data Foundation, DDF). 23
 - Authorization Requirements for Unified Demand Forecast. 44
 - Authorization Requirements for Demand Planning SAP Fiori Apps. 44
 - Authorization Requirements for Omnichannel Article Availability and Sourcing (OAA). 46
 - Authorization Requirements for Omnichannel Promotion Pricing (OPP). 53
- 2.5 Session Security Protection. 53
- 2.6 Network and Communication Security. 54
- 2.7 Internet Communication Framework Security. 59
- 2.8 Data Storage Security. 60
- 2.9 Data Protection and Privacy. 62
 - Introduction. 62
 - Glossary. 63
 - Consent. 66
 - Read Access Logging. 66
 - Information Retrieval. 67
 - Deletion of Personal Data. 68
 - Change Log. 82
 - Enabling Data Protection and Privacy-Related Functionality. 83
- 2.10 Security for Additional Applications. 94
- 2.11 Security for Omnichannel Article Availability and Sourcing. 95
- 2.12 Security for Omnichannel Promotion Pricing Using SAP HANA XS Advanced. 96
- 2.13 Enterprise Services Security. 99
- 2.14 Payment Card Security According to PCI-DSS. 99
 - Introduction. 99
 - Credit Card Usage Overview. 100
 - PCI-Related Customizing. 103

	Rotation or Changing of Encryption Keys.	107
	Masked/Unmasked Display.	111
	Logging of Payment Card Number Access.	112
	Encryption, Decryption, and Storage of Encrypted Credit Card Numbers.	112
	Migration.	114
	Deletion of Credit Card Storage.	115
	Archiving.	115
	Interfaces for IDoc/Services.	116
	RFC Debugging.	117
	Forward Error Handling.	117
	Card Verification Values.	118
2.15	Security-Relevant Logging and Tracing.	118
2.16	Services for Security Lifecycle Management.	119
3	Business Scenario.	121
3.1	Performing POS Data Transfer and Audit.	121
3.2	Performing POS Transaction Data Migration.	122
3.3	Performing POS Sales Analysis.	123
3.4	Performing Inventory Visibility Analysis.	124
3.5	Performing Sales (Billing) Document Analysis.	125
3.6	Performing Multichannel Sales Analysis.	126
3.7	Enabling Demand Data Foundation and Creating Demand Forecast.	127
3.8	Monitoring On-Shelf Availability.	134
4	Configuration.	136
4.1	Configure Demand Data Foundation (DDF).	136
	Enable Time-Dependent Article Hierarchies (Optional).	159
	Configure Data Replication from SAP ERP to DDF.	160
	Configure DDF Integration Scenarios.	167
	Optimize DDF Performance.	172
4.2	Set Up and Configure DDF Services.	174
	Calculate Distribution Curves.	174
	Set Up the Similar Products Search.	182
	Import Product Attributes and Descriptions from Source Master Data System into DDF.	184
4.3	Configure Unified Demand Forecast (UDF).	186
	Best Practices.	189
	Configure Parameters for Modeling.	193
	Configure Parameters for Forecasting.	206
	Optimize UDF Performance.	217
	Partition Tables for UDF and DDF.	225
	Configure Hierarchical Priors (HPRs).	226
	Configure Time-Dependent Error Variances (Recommended).	230

	Configure User DIFs.	232
	Configure User DIFs for Promotion Cannibalization for SAP Advanced Trade Management Analytics.	236
	Configure Ignore DIFs.	239
	Configure Reference Products.	239
	Configure Placeholder Products.	240
	Configure Forecasting Based on Aggregated Product Data (Aggregation Profile 0001).	241
	Configure Modeling for Group of Product Locations (Aggregation Profile 0002).	243
	Configure Demand Decomposition.	248
	Configure Holdout Forecasts.	249
	Configure Intraday Forecasts.	251
	Configure Forecast Confidence Index (FCI).	251
	Configure Modeling and Forecasting by Tactic Type.	254
4.4	Optimize OAA Performance.	254
4.5	Set Up SAP Fiori Apps for SAP Customer Activity Repository.	257
5	Operation.	258
5.1	Monitoring.	258
	Alert Monitoring.	258
	Data Consistency.	260
	Detailed Monitoring and Tools for Problem and Performance Analysis.	264
	Detailed Monitoring and Analysis Tools Specific to On-Shelf Availability.	269
	Detailed Monitoring and Analysis Tools Specific to Demand Data Foundation.	271
	Detailed Monitoring and Analysis Tools Specific to Omnichannel Promotion Pricing.	275
	Detailed Monitoring and Analysis Tools Specific to Omnichannel Article Availability and Sourcing.	278
5.2	Management.	279
	Starting and Stopping.	279
	Software Configuration.	281
	Administration Tools.	281
	Draft Handling for Demand Planning SAP Fiori Apps.	287
	Backup and Restore.	288
	Load Balancing.	289
5.3	High Availability.	290
5.4	Software Change Management.	291
5.5	Troubleshooting for SAP Customer Activity Repository Modules.	293
	Troubleshooting for Omnichannel Article Availability and Sourcing (OAA).	293
	Troubleshooting for On-Shelf Availability.	298
	Troubleshooting for Modeling and Forecasting.	300
5.6	Support Desk Management.	305
6	Appendix.	307

6.1	Transaction Log (TLOG) Data Model and Storage.	307
6.2	Extensibility and Extensions.	326
6.3	TLOG API.	330
6.4	Enterprise Services.	336
	Ad Content Processing.	337
	Assortment Management.	341
	Business Partner Data Management.	350
	Demand Forecast Processing.	355
	Demand Planning Time Series Processing.	361
	Inventory Processing.	368
	Location Data Management.	373
	Merchandise Management.	382
	Retail Offer Management.	392
	Organizational Management.	393
	Point of Sale Transaction Processing.	396
	Product Property Management.	406
	Source of Supply Determination.	412
	Vendor Fund Management.	420

1 Getting Started

About this Document

This *SAP Customer Activity Repository Administration Guide* is the single source of information for implementing SAP Customer Activity Repository with all its modules. The guide provides security, business scenario, configuration, and operation information for your solution.

i Note

You can find this guide on SAP Help Portal for SAP Customer Activity Repository applications bundle at <https://help.sap.com/viewer/p/CARAB> under ► *Administration* 🗨️.

We strongly recommend that you use the document on SAP Help Portal. The guide is updated with each new release of the software.

→ Tip

This chapter references several SAP Notes that are regularly updated with new information. If you want to be informed of such updates because a particular note is relevant for your scenario, you can easily set up email notifications for it. For information on how to do this, see SAP Note [2478289](#) 🗨️ (*How to get notifications for SAP Notes or KBAs*).

Planning, Installation, Upgrade

For information on how to plan, install, and upgrade your SAP Customer Activity Repository solution, see the following guides at <https://help.sap.com/viewer/p/CARAB> under ► *Installation and Upgrade* 🗨️:

- For new installations: *Common Installation Guide*
- For upgrade scenarios: *Common Upgrade Guide*

Related Information

For implementation topics not covered in this guide, see the following:

Information About...	Path
Get Involved Early	https://support.sap.com/en/offerings-programs/get-involved-early.html
High Availability	https://wiki.scn.sap.com/wiki/display/SI/SAP+High+Availability
Incidents (reporting incidents, finding solutions)	https://launchpad.support.sap.com/#incident/solution
Network Security	https://support.sap.com/en/offerings-programs/support-services/security-optimization-services-portfolio.html
Performance	https://www.sap.com/about/benchmark/sizing/performance.html
SAP Product Portfolio	https://www.sap.com/products-a-z.html
Sizing (sizing guidelines, Quick Sizer tool, calculation of hardware requirements, such as CPU, disk and memory resource)	https://www.sap.com/about/benchmark/sizing.html
Support package stacks, latest software versions, patch level requirements	https://support.sap.com/sp-stacks

1.1 Naming Conventions

Throughout this document the following naming conventions apply.

Terms and their Definitions

The following terms are used consistently in this guide:

Term	Definition
back-end server / system	The SAP NetWeaver-based back-end server on which SAP Customer Activity Repository and its consuming applications (such as SAP Assortment Planning or SAP Promotion Management) are installed.
front-end server / system	The SAP NetWeaver-based front-end server on which the SAP Gateway, SAP Fiori launchpad, the central SAP Fiori UI component, and the product-specific SAP Fiori UI component are installed.
<i>Common Installation Guide</i>	Common installation guide valid for all the applications included in SAP Customer Activity Repository applications bundle, providing instructions for new installation scenarios
<i>Common Upgrade Guide</i>	Common upgrade guide valid for all the applications included in SAP Customer Activity Repository applications bundle, providing instructions for upgrade scenarios

Naming Differences

Due to naming differences between the underlying technical objects of the components, the names of the following business objects are used interchangeably in this document:

SAP Customer Activity Repository	Demand Data Foundation (DDF) and Unified Demand Forecast (UDF)	SAP Assortment Planning SAP Allocation Management SAP Merchandise Planning SAP Promotion Management	SAP ERP
article	product location (specific product in a specific location)	product	article material
article variant	product variant	product variant	article variant
store	location	location	store site

1.2 Introduction to SAP Customer Activity Repository

SAP Customer Activity Repository as customer-centric, unified platform; overview of its contained modules, such as Inventory Visibility, Unified Demand Forecast (UDF), Demand Data Foundation (DDF, with different integration scenarios), Omnichannel Promotion Pricing (OPP)

Customer-Centric, Unified Platform

Your customers are the driving force of your business. They are an ever-evolving group who buy products in stores, research products online prior to making purchases, order products and product parts through catalogs, wait for promotions, splurge on gifts during holidays, make returns and exchanges when they are unhappy with their purchases, and sometimes even walk out of your stores when the product they came to buy is not available.

SAP Customer Activity Repository is a foundation that collects transactional data that was previously spread over multiple independent applications in diverse formats. The repository provides a common foundation and a harmonized multichannel transaction data model for all consuming applications.

SAP Customer Activity Repository consolidates data related to customer transactional activities in one, unified platform as follows:

- Transactions your customers carry out in your brick-and-mortar stores are transferred to the repository, typically using trickle feed processing.
- Sales documents, created in your source SAP ERP system as a result of orders your customers place on the Web, through a call center or from a catalog, are either regularly replicated to the repository or accessed directly from the SAP ERP tables. The direct access to SAP ERP tables is only possible when SAP ERP and SAP Customer Activity Repository are installed on the same SAP HANA database.

SAP Customer Activity Repository classifies all these transaction by the order channel in which they were carried out.

Collecting loyalty information at the point-of-sale as well as the replication of customer information from a source CRM system to the repository allows you to drill down to the individual customer level when analyzing the transactional data.

Inventory Visibility

SAP Customer Activity Repository gives you insight to your current inventory position. Inventory information is available to the repository from a source SAP ERP system either through replication or through direct access to SAP ERP tables. The repository combines SAP ERP inventory information with the unprocessed POS sales information (that is, POS sales figures which have not yet been sent to SAP ERP). Combining the current SAP ERP inventory information with unprocessed POS sales figures allows you to gain a clearer picture of your current inventory.

The Inventory Visibility module also includes Omnichannel Article Availability (OAA).

Analytics

All data contained in the repository is exposed to consuming applications through SAP HANA views included in SAP HANA content for SAP Customer Activity Repository. The repository leverages all the flexibility and the convenience of SAP HANA views to simplify access to your customer's transactional data. This allows you to react faster, predict faster and make inventory and pricing decisions in your retail business faster than ever before.

SAP POS Data Management 1.0 and SAP Customer Activity Repository

SAP POS Data Management (SAP POS DM) 1.0 and SAP Customer Activity Repository are two **separate** applications that allow you to receive and process POS transaction data from connected stores. You do not need to have SAP POS DM 1.0 installed to use SAP Customer Activity Repository. In fact, you **cannot** install both SAP POS DM 1.0 and SAP Customer Activity Repository on the same SAP HANA database.

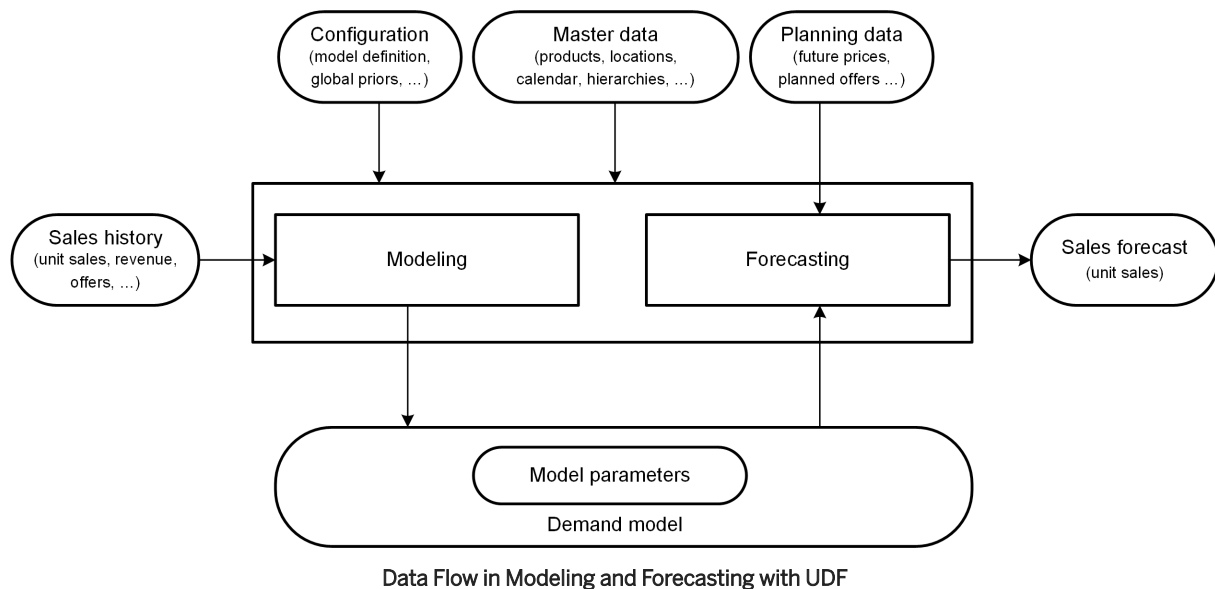
Both applications rely on the POS Inbound Processing Engine (PIPE) to collect transaction data from connected stores, process the data, and send it to follow-on applications. PIPE is made available in both applications through the inclusion of the Point of Sale Data Management software component (RTLPOSDM). However, both applications contain different versions of this component:

Application	Software Component Version	Functionality
SAP POS DM 1.0	RTLPOSDM 100	<ul style="list-style-type: none">• Basic PIPE functionality• Master data obtained from SAP BW
SAP Customer Activity Repository	RTLCAR	<ul style="list-style-type: none">• Basic PIPE functionality• Master data obtained from a source SAP ERP system, and, optionally, a source SAP CRM system• Additional functionality:<ul style="list-style-type: none">◦ SAP Workforce Management Integration◦ Customizing and tasks for order channel assignment◦ Additional fields in the / POSDW/TLOGF table, BAdIs, and tasks for customer identification◦ Predefined worklist to determine unprocessed sales

SAP Customer Activity Repository offers significant advantages over SAP POS DM 1.0, including the availability of multichannel data in the same platform, predictive capabilities, inventory visibility and multichannel sales analytics content.

Unified Demand Forecast

Unified Demand Forecast (UDF) is the module in SAP Customer Activity Repository that provides the demand modeling and forecasting services:



Technically, UDF is provided as an application function library (software component SAP_RTL_AFL_FOR_SAP_HANA) that you install and run in the SAP HANA database.

UDF requires the installation and implementation of the Demand Data Foundation (DDF) module in SAP Customer Activity Repository.

For more information about UDF, see <https://help.sap.com/viewer/p/CARAB> >> <Version> > Application Help > SAP Customer Activity Repository > Unified Demand Forecast >.

Demand Data Foundation

Demand Data Foundation (DDF, software component RTLDFF) is the module that provides the consuming applications installed on top of SAP Customer Activity Repository with planning, analysis, and forecasting capabilities. DDF is a reusable data layer and includes a proprietary data model, data import infrastructure, reuse frameworks (such as exception handling and process controller), and reuse tools (such as data maintenance and scheduling interfaces).

DDF runs on the SAP HANA Platform, which stores transactional data and master data. DDF allows for the implementation of transactional (OLTP) and analytical (OLAP) use cases. DDF also supports UDF.

For more information about DDF, see <https://help.sap.com/viewer/p/CARAB> >> <Version> > Application Help > SAP Customer Activity Repository > Demand Data Foundation >.

Integrating Master Data

DDF can receive the following master data:

- Image
- Inventory
- Location (mandatory)
- Location Hierarchy
- Offer
- Placeholder Product
- Product (mandatory)
- Product Hierarchy (mandatory)
- Product Location (mandatory)
- Transportation Lane
- User DIF
- Vendor
- Vendor Fund

You have the following options for integrating the master data:

1. SAP ERP Based Integration

This option is best suited where the master data system of record is an SAP ERP (SAP Retail) application. SAP ERP sends master data to DDF using the DRF data replication framework (DRF, transaction **DRFOUT**). The standard implementation of this framework maps the SAP ERP fields to the fields of the DDF staging tables. The DRF allows you to filter the data that you want to send to DDF, based on criteria such as project roll-outs or data volumes.

i Note

For the minimum required releases of SAP ERP, see the *Prerequisites* section of the *Common Installation Guide* (for new installations) or the *Common Upgrade Guide* (for upgrade scenarios).

For information on how to configure and use the DRF, see :

- <https://help.sap.com/viewer/p/CARAB> >> <Version> > Application Help > SAP Customer Activity Repository > Demand Data Foundation > Integration Information > and Master Data Replication from SAP ERP to Demand Data Foundation.
- SAP Help Portal for SAP Master Data Governance at https://help.sap.com/viewer/p/SAP_MASTER_DATA_GOVERNANCE >> Application Help > SAP Master Data Governance > Working with SAP Master Data Governance > Working with SAP MDG, Central Governance > General Functions > Data Replication >
- SAP Customer Activity Repository Administration Guide:
 - *Configure Demand Data Foundation (DDF)*
 - *Configure Data Replication from SAP ERP to DDF*

2. Legacy System

You can use this option when the system of record for your master data is not an SAP ERP application (SAP ERP 6.0 with Enhancement Package EHP 5 SP Stack 07 or higher or EHP 6 SP Stack 02 or higher). This option includes any legacy system.

DDF provides inbound interfaces to receive the data into the staging tables. For more information, see <https://help.sap.com/viewer/p/CARAB> >> <Version> > Application Help > SAP Customer Activity Repository > Demand Data Foundation > Integration Information >.

Integrating Historical Demand Data

You must provide the historical demand data through one of the ways described in the following. This allows you to use the data and to model and forecast demand as required by your consuming application. For example, you might want to perform analytics in SAP Customer Activity Repository. Or you might want to forecast consumer demand with UDF and use the results to manage offers in SAP Promotion Management. UDF analyzes the provided historical demand data to identify and quantify each of the factors that affected your unit sales in the past (modeling) and to accurately forecast future demand (forecasting).

You can integrate different types of historical demand data in DDF, based on the following time series:

- Point-of-sale (POS) data
- Generic consumption data
- Sales orders

Time Series

Each time series is completely independent. You can have separate outputs as a result of the modeling and forecasting processes. The outputs allow you to see different demand influencing factors (DIFs) by the different data sources in the same system.

→ Recommendation

You should provide 2 years of historical input data to ensure the proper interpretation of seasonality, trend, and other yearly factors.

i Note

For more information about the time series described in the following, see <https://help.sap.com/viewer/p/CARAB> > <Version> > Application Help > SAP Customer Activity Repository > Demand Data Foundation > Data Management > Time Series >.

Integrating Promotions and Offers

Promotions are available in SAP ERP. Offers are more detailed views of promotions and can be available with SAP Promotion Management, for example. Offers can include information on tactics and tactic types, allowing you to quantify their impact on the promotion and, ultimately, on the demand of the product.

The following scenarios are possible:

- Historical offers were created in SAP Promotion Management.
The closed-loop integration ensures that the same offer identifier (ID) can be used across systems. This integration aligns SAP Promotion Management, SAP ERP, and either SAP Customer Activity Repository or SAP POS Data Management 1.0.
- Historical offers were not created in SAP Promotion Management.
The closed-loop integration must be created manually because the register and TLOG data do not distinguish the offer identifier (ID).

For more information about ERP Promotions and Offers see [Export ERP Promotions and Bonus Buys to DDF \[page 168\]](#).

Forecast Results

- The forecast results are provided in the /DMF/UFC_TS table.

For more information about the data generated by modeling and by forecasting, see <https://help.sap.com/viewer/p/CARAB> |> <Version> |> *Application Help* |> *SAP Customer Activity Repository* |> *Unified Demand Forecast* |> *Outbound Time Series* |> .

- You can use the *Analyze Forecast* SAP Fiori app to visualize detailed sales, modeling, and forecasting information and perform in-depth analyses. For more information, see <https://help.sap.com/viewer/p/CARAB> |> <Version> |> *Application Help* |> *SAP Customer Activity Repository* |> *SAP Fiori for SAP Customer Activity Repository* |> *Standalone SAP Fiori Apps for SAP Customer Activity Repository* |> *Analyze Forecast* |> .

In the back-end SAP HANA content for the app, the `sap.hba.t.rtl.udf.afc.v/TimeseriesQuery` view is available. You can use this view to query the KPIs (actual sales, model fit, corrected sales, forecast, forecast decomposition) for a given combination of product, location, sales organization, distribution channel, order channel, and time series, between a given date range. For detailed information on the view, select it in your SAP HANA studio and choose *Auto Documentation* from the context menu.

- You can also provide the forecast results to an external system (for example, to SAP Forecasting and Replenishment). Different function modules are available for this purpose. You execute the function module from the external system using a Remote Function Call (RFC). The function modules then retrieve the forecast results from the SAP Customer Activity Repository system.

For more information, see <https://help.sap.com/viewer/p/CARAB> |> <Version> |> *Application Help* |> *SAP Customer Activity Repository* |> *Unified Demand Forecast* |> *General Services* |> *Provide Demand Forecasts to External System* |> .

For more information, see:

- <https://help.sap.com/viewer/p/CARAB> |> <Version> |> *Application Help* |> *SAP Customer Activity Repository* |> *Demand Data Foundation* |> *Data Management* |> *Master Data* |> .
- <https://help.sap.com/viewer/p/CARAB> |> <Version> |> *Application Help* |> *SAP Customer Activity Repository* |> *Demand Data Foundation* |> *Integration Information* |> *Inbound Processing* |> .
- *Detailed Monitoring and Analysis Tools Specific to Demand Data Foundation*

Omnichannel Promotion Pricing (OPP)

Omnichannel Promotion Pricing (software component `RTLDDF`) is one of the modules included in SAP Customer Activity Repository.

OPP contains a central price and promotion repository that stores all the relevant information for the calculation of effective sales prices in all sales and communication channels (points of sale, web, mobile, call centers), for all items in a shopping cart. The OPP data that includes regular prices and OPP promotions can be replicated via IDocs to the different sales channel applications.

For the calculation of the effective sales prices, OPP provides the **promotion pricing service**. This promotion pricing service can be deployed locally or centrally:

- **Local deployment**
With this deployment option, the promotion pricing service runs locally on the database of the corresponding sales channel application. Therefore, regular prices and OPP promotions are replicated from the central price and promotion repository to the database of the sales channel application. In this way, the sales application can work without an additional remote system being continuously available.

- **Central deployment**

With this deployment option, the promotion pricing service runs on the central price and promotion repository located in SAP Customer Activity Repository powered by SAP HANA extended application services (XS advanced, XSA).

i Note

OPP provides a local and a central deployment for **SAP Commerce**.

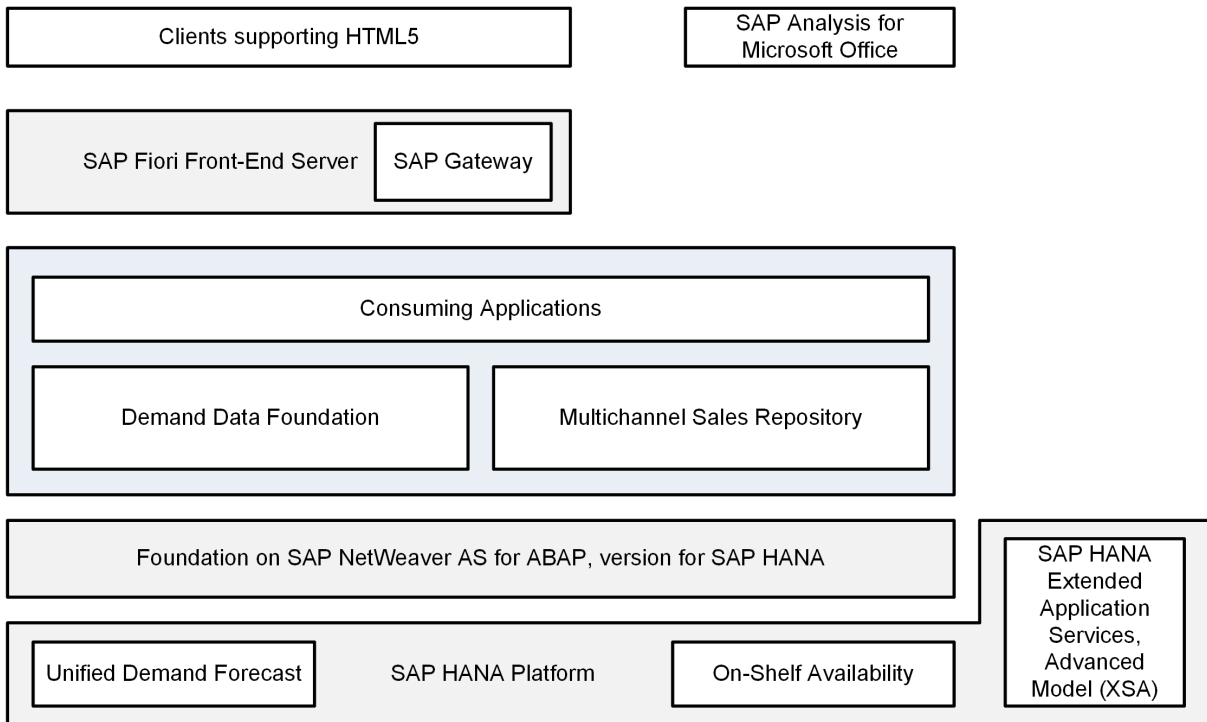
For more information about the promotion pricing service in SAP Commerce, see the *Administration Guide* of SAP Commerce, integration package for SAP for Retail on SAP Help Portal at <https://help.sap.com/viewer/p/IPR> under **>> <Version> > Administration > Administration Guide > Omnichannel Promotion Pricing >**.

More Information

For more information about SAP Customer Activity Repository, its modules, and its consuming applications, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB>.

1.3 Overall System Landscape

The following diagram shows a potential system landscape involving a combination of SAP Customer Activity Repository and its add-ons.



2 Security

[Why is Security Necessary? \[page 16\]](#)

With the increasing use of distributed systems and the Internet for managing business data, the demands on security are also on the rise.

[Security Aspects of Data, Data Flow and Processes \[page 17\]](#)

[User Administration and Authentication \[page 20\]](#)

[Authorizations \[page 23\]](#)

SAP Customer Activity Repository uses the authorizations provided by the SAP NetWeaver Application Server ABAP. Therefore, the recommendations and guidelines for authorizations as described in the **SAP NetWeaver Security Guide** also apply to SAP Customer Activity Repository.

[Session Security Protection \[page 53\]](#)

[Network and Communication Security \[page 54\]](#)

Your network infrastructure is extremely important in protecting your system.

[Internet Communication Framework Security \[page 59\]](#)

[Data Storage Security \[page 60\]](#)

[Data Protection and Privacy \[page 62\]](#)

[Security for Additional Applications \[page 94\]](#)

[Security for Omnichannel Article Availability and Sourcing \[page 95\]](#)

When using omnichannel article availability and sourcing (OAA), make sure that you are aware of the following security risks and that appropriate mitigations are in place, in the areas of ATP calculation, sourcing, and temporary reservations.

[Security for Omnichannel Promotion Pricing Using SAP HANA XS Advanced \[page 96\]](#)

[Enterprise Services Security \[page 99\]](#)

[Security-Relevant Logging and Tracing \[page 118\]](#)

[Services for Security Lifecycle Management \[page 119\]](#)

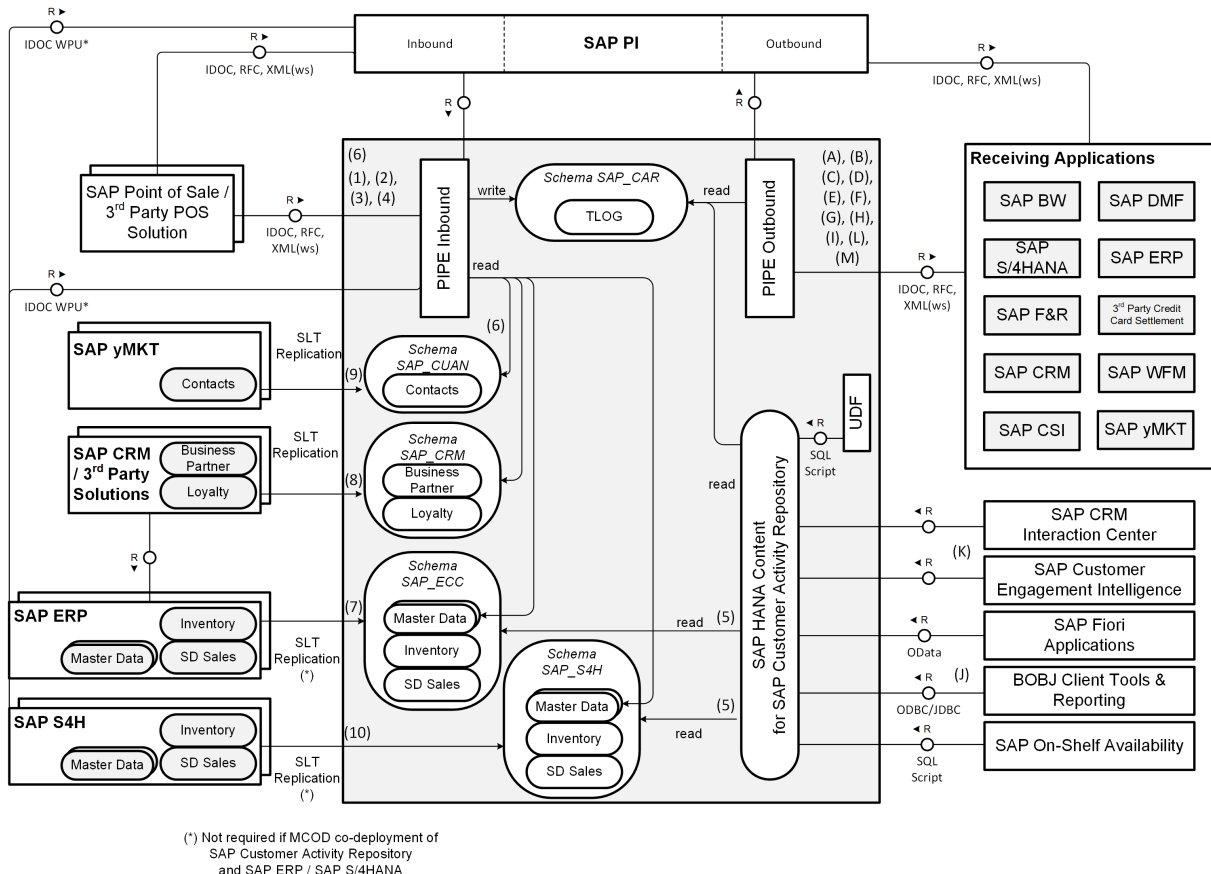
2.1 Why is Security Necessary?

With the increasing use of distributed systems and the Internet for managing business data, the demands on security are also on the rise.

When using a distributed system, you need to be sure that your data and processes support your business needs without allowing unauthorized access to critical information. User errors, negligence, or attempted manipulation on your system should not result in loss of information or processing time. These demands on security apply likewise to the SAP Customer Activity Repository. To assist you in securing the SAP Customer Activity Repository, we provide this *Administration Guide*.


2.2 Security Aspects of Data, Data Flow and Processes

The figure below shows an overview of the data flow process for the SAP Customer Activity Repository application.



The table below shows the security aspect to be considered for the process step and what mechanism applies.

Step	Description	Security Measure
Inbound Flow 1	Manual creation of transaction within POS Workbench (ABAP DynPro / Web DynPro)	SAP Dialog User with necessary authorizations
Inbound Flow 2	Inbound transaction from SAP Retail using IDoc	SAP Communication User with necessary authorizations, ALE tRFC, encryption**
Inbound Flow 3	Inbound transaction using BAPI	SAP Communication User with necessary authorizations, RFC
Inbound Flow 4	Inbound transaction using Web Service	SAP Communication User with necessary authorizations, HTTPS

Step	Description	Security Measure
Inbound Flow 5	Master data retrieval (non-sensitive data)	SAP Dialog/Communication User with necessary authorizations, RFC
Inbound Flow 6	Loyalty card data retrieval from a CRM solution (non- sensitive data)	SAP Dialog/Communication User with necessary authorizations, RFC
Inbound Flow 7 (when required)	Data replication from SAP ERP.	SLT replication (SAP system user with necessary authorizations to set up replication, SAP technical user(s) with necessary authorizations for replication of target schema)
	<div style="border: 1px solid #ccc; padding: 10px; background-color: #f9f9f9;"> <p>i Note</p> <p>Replication is not required in cases of Multiple Components in One Database (MCOB) co-deployment of SAP Customer Activity Repository and SAP ERP.</p> <p>For more information, see http://help.sap.com/car  <i>Installation and Upgrade Information</i> </p> <p><i>Installation Guide</i> .</p> </div>	
Inbound Flow 8	Loyalty data replication from a CRM solution	SLT replication (SAP system user with necessary authorizations to set up replication, SAP technical user(s) with necessary authorizations for replication of target schema)
Inbound Flow 9	Contact data replication from SAP Marketing	SLT replication (SAP system user with necessary authorizations to set up replication, SAP technical user(s) with necessary authorizations for replication of target schema)
Inbound Flow 10 (when required)	Data replication from SAP S4HANA	SLT replication (SAP system user with necessary authorizations to set up replication, SAP technical user(s) with necessary authorizations for replication of target schema)
Outbound Flow A*	Outbound Aggregated Sales to SAP Retail/SAP S/4HANA using IDoc	SAP Communication User with necessary authorizations, ALE tRFC, encryption**
Outbound Flow B*	Outbound Sales Data & Goods Receipt/ Issue Information to SAP F&R using BAPI	SAP Communication User with necessary authorizations, RFC

Step	Description	Security Measure
Outbound Flow C*	Outbound Credit Card Settlement using BAPI	SAP Communication User with necessary authorizations, RFC
Outbound Flow D*	Outbound Payment Card using BAPI	SAP Communication User with necessary authorizations, RFC
Outbound Flow E*	Outbound Inventory Management / Goods Movement to SAP ERP / SAP S/4HANA using BAPI	SAP Communication User with necessary authorizations, RFC
Outbound Flow F*	Outbound (Aggregated) Sales Data to DMF using BAPI	SAP Communication User with necessary authorizations, RFC
Outbound Flow G*	Outbound Loyalty Information using Web Service	SAP Communication User with necessary authorizations, HTTPS
Outbound Flow H*	Outbound Sales Analysis, Error Statistics, and Loss Prevention Information to SAP BI	SAP Dialog/Communication User with necessary authorizations
Outbound Flow I*	Outbound Aggregated Historical Transaction & Product Sales Counts to SAP WFM using IDoc	SAP Communication User with necessary authorizations, ALE tRFC
Outbound Flow J	Analytical query view data (for example, Inventory Visibility, and so on) to reporting tools	SAP Hana Database User with necessary object & analytical privileges, ODBC/JDBC
Outbound Flow K	Customer-based view data (for example, customer segmentation, and so on) to SAP CRM	SAP Communication User with necessary authorizations, RFC
Outbound Flow L*	Outbound Sales Transactions and Goods Movements to SAP Consumer Sales Intelligence using REST Service	SAP Communication User with necessary authorizations, HTTPS, HTTP Connection to External Server
Outbound Flow M*	Outbound Sales Data to SAP Hybris Marketing (yMKT)	SAP Communication User with necessary authorizations, HTTPS, HTTP Connection to ABAP System

* Within Task Processing

** Sensitive data that must be encrypted would consist of credit card information, and this information will be stored in a secure manner within the SAP Customer Activity Repository database (for example, encrypted, masked, and so on).

2.3 User Administration and Authentication

SAP Customer Activity Repository uses the user management and authentication mechanisms provided with the SAP NetWeaver platform, in particular the AS ABAP.

Therefore, the security recommendations and guidelines for user administration and authentication as described in the *SAP NetWeaver Application Server ABAP Security Guide* also apply to SAP Customer Activity Repository.

The SAP HANA content for SAP Customer Activity Repository uses the user management and authentication mechanisms provided with the SAP HANA appliance software. Therefore, the security recommendations and guidelines for user administration and authentication as described in the *Security* section of the *Administrator's Guide, SAP HANA Live for SAP Business Suite, Support Package Stack 02* apply.

In addition to these guidelines, we include information about user administration and authentication that specifically applies to SAP Customer Activity Repository.

User Management

User management for SAP Customer Activity Repository uses the mechanisms provided by the SAP NetWeaver AS ABAP, for example, tools, user types, and password policies. For an overview of how these mechanisms apply for SAP Customer Activity Repository, see the sections below. In addition, we provide a list of the standard users required for operating SAP Customer Activity Repository.

Similarly, other components of the technical system landscape for SAP Customer Activity Repository, such as SAP ERP Central Component (ECC) and/or SAP NetWeaver Process Integration (PI), also use the mechanisms provided with the SAP NetWeaver AS ABAP.

User Administration Tools

The table below shows the tools to use for user management and user administration with SAP Customer Activity Repository.

Tool	Description	Requirements
User and role maintenance with SAP NetWeaver AS ABAP (transactions SU01 , PFCG)	<p>For more information, see:</p> <ul style="list-style-type: none"> • AS ABAP Authorization Concept in the <i>SAP NetWeaver Application Server ABAP Security Guide</i> • SAP Library for SAP NetWeaver on SAP Help Portal at http://help.sap.com/nw74 <ul style="list-style-type: none"> ▶ Application Help ▶ Function-Oriented View ▶ Solution Life Cycle Management ▶ Security and User Administration ▶ 	SAP NetWeaver Application Server ABAP should be running.

User Types

It is often necessary to specify different security policies for different types of users. For example, your policy may specify that individual users who perform tasks interactively have to change their passwords on a regular basis, but not those users under which background processing jobs run.

The user types that are required for SAP Customer Activity Repository include:

- Individual users:
 - Dialog users are used for interactive system access, such as SAP GUI for Windows or RFC connections.
 - Internet users are used for internet connections. The same policies apply as for dialog users, but used for Internet connections.
 - Named users are required for all Business Intelligence clients like SAP BusinessObjects BI Suite UIs.
- Technical users:
 - Communication users are used for dialog-free communication through external RFC calls.
 - Background users are used for background processing and communication within the system, such as, running scheduled inbound/outbound dispatcher jobs.

For more information on these user types, see *User Types* in the *SAP NetWeaver Application Server ABAP Security Guide*.

All user types described in the *SAP HANA Security Guide* are required for the SAP HANA content for SAP Customer Activity Repository. For more information, see *User Types* in the *SAP HANA Security Guide* at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM.

Standard Users

SAP Customer Activity Repository does not require specialized standard users. The POS Data Transfer and Audit component of SAP Customer Activity Repository indirectly uses SAP NetWeaver standard users.

For more information about SAP NetWeaver standard users, see *Protecting Standard Users* in the *SAP NetWeaver Application Server ABAP Security Guide*.

→ Recommendation

We recommend changing the user IDs and passwords for any users that are automatically created during installation.

Users and Roles for SAP Smart Business Applications

For more information on the users and roles required by specific SAP Smart Business applications delivered with SAP Customer Activity Repository, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB>

► <Version> ► *Application Help* ► *SAP Customer Activity Repository* ► *SAP Fiori for SAP Customer Activity Repository* ► *SAP Smart Business for SAP Customer Activity Repository* ► *SAP Smart Business for Multichannel Sales Analytics* ► The *App Implementation* documentation for each SAP Smart Business app contains the information on the required users and roles.

Users and Roles for Standalone SAP Fiori Apps

SAP Customer Activity Repository is delivered with multiple standalone apps. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB>:

- For app descriptions, see section *Standalone SAP Fiori Apps for SAP Customer Activity Repository* in the application help for SAP Customer Activity Repository.
- For setup instructions, see section *Set Up Standalone SAP Fiori Apps for SAP Customer Activity Repository* in the *Common Installation Guide* or the *Common Upgrade Guide*.

User Data Synchronization

The application does not deliver additional user data synchronization related features in addition to those available in the SAP NetWeaver platform. It also does not impose any special needs or restrictions, which would limit the usage of related SAP NetWeaver tools.

→ Recommendation

For any scenarios where system inter-connectedness at the user level is a requirement, it is recommended that the same users exist throughout all the pertinent connected systems in the landscape.

Integration into Single Sign-On Environments

SAP Customer Activity Repository supports the Single Sign-On (SSO) mechanisms provided by the SAP NetWeaver AS ABAP. Therefore, the security recommendations and guidelines for user administration and authentication as described in the *SAP NetWeaver Security Guide* also apply to SAP Customer Activity Repository.

For more information about the available authentication mechanisms, see the *User Authentication and Single Sign-On* section in the *SAP NetWeaver Library*.

More Information

You can find the product documentation for SAP NetWeaver on SAP Help Portal at https://help.sap.com/viewer/p/SAP_NETWEAVER.

2.4 Authorizations

SAP Customer Activity Repository uses the authorizations provided by the SAP NetWeaver Application Server ABAP. Therefore, the recommendations and guidelines for authorizations as described in the **SAP NetWeaver Security Guide** also apply to SAP Customer Activity Repository.

The SAP NetWeaver authorization concept is based on assigning authorizations to users based on roles. For role maintenance, use the profile generator (transaction **PF03**) on the Application Server ABAP.

For more information, see https://help.sap.com/viewer/product/SAP_NETWEAVER/ALL/en-US and select your SAP NetWeaver version. Choose ► *Security* ► *SAP NetWeaver Security Guide* ►.

i Note

For information about how to create roles, see https://help.sap.com/viewer/product/SAP_NETWEAVER/ALL/en-US and select your SAP NetWeaver version. Choose ► *Application Help* ► *SAP NetWeaver Library: Function-oriented View* ► and search for *Role Administration*.

[Authorization Requirements for SAP Customer Activity Repository \(Including Demand Data Foundation, DDF\) \[page 23\]](#)

[Authorization Requirements for Unified Demand Forecast \[page 44\]](#)

Setting up the UDF authorizations is mandatory for SAP Customer Activity Repository and also for the consuming applications. Because of this, the steps are described in the common guides for SAP Customer Activity Repository applications bundle.

[Authorization Requirements for Demand Planning SAP Fiori Apps \[page 44\]](#)

[Authorization Requirements for Omnichannel Article Availability and Sourcing \(OAA\) \[page 46\]](#)

[Authorization Requirements for Omnichannel Promotion Pricing \(OPP\) \[page 53\]](#)

2.4.1 Authorization Requirements for SAP Customer Activity Repository (Including Demand Data Foundation, DDF)

SAP HANA Content for SAP Customer Activity Repository

The SAP HANA content for SAP Customer Activity Repository relies on the access control mechanisms of the underlying SAP HANA database. As a prerequisite, it is assumed that every business user (user accessing SAP HANA content for SAP Customer Activity Repository in the SAP HANA database) is created as a named SAP HANA database user. To control the business user's access to the SAP HANA content and displayed data for SAP Customer Activity Repository, the relevant authorization settings must be configured in the SAP HANA database.

SAP HANA has implemented the regular SQL authorization concept based on privileges. Named SAP HANA database users are normally only granted access to the top-level (query) views required for their direct use,

and this is done using SAP HANA object privileges. In situations where there are further restrictions required on the actual results to be provided by these views, SAP HANA analytical privileges serve to further restrict the data at the row-level. These configurations must be based on specific retailers' needs as well as the types of data involved and the existing authorizations relevant for the data involved.


The SAP HANA content for the SAP Customer Activity Repository follows the same approach to security authorizations privileges as was originally established by SAP HANA Live for SAP Business Suite. For more information, see https://help.sap.com/viewer/p/SAP_HANA_LIVE ► [SAP HANA Live for SAP Business Suite Administrator's Guide](#) ► [Security](#) ► [Authorizations](#) ► [Privileges](#) ►.

It is recommended that any consumption or further extension of the SAP HANA content for SAP Customer Activity Repository also follows these security principles.

Analytics Authorization Assistant

The SAP HANA content for SAP Customer Activity Repository provides views that are very similar to those from SAP HANA Live for SAP ERP. It also provides views that expose data from SAP S/4HANA in a similar way. Although SAP HANA Live for SAP ERP is no longer a required component for view content, there are other beneficial components and tools provided by this solution. For example, you can use the Analytics Authorization Assistant to manage authorizations.

The Analytics Authorization Assistant can transform authorizations that a user has in SAP NetWeaver AS ABAP into analytic privileges and necessary object privileges on the SAP HANA database. It does this by creating a user-based SAP HANA role which can then be granted to the named SAP HANA database user. The created SAP HANA privilege objects are used to access the applicable views, whether they are in SAP HANA Live for SAP ERP, or SAP HANA content for SAP Customer Activity Repository.

The means by which the relevant user-specific authorizations are mapped to specific high-level query views is through the definition of Analytics Authorization Assistant metadata within the view itself using the tool's SAP HANA Developer Studio plug-in. To grant analytic privileges, you must create the metadata for the SAP HANA content for SAP Customer Activity Repository. You can find information on how to do this in SAP Note [2555747](#) . It is also recommended to follow this approach for any custom views as well as for the data associated with them.

The user-specific authorizations required by SAP Customer Activity Repository, specifically, the data found in tables `USRBF2` and `UST12`, are maintained in a source SAP ERP or S/4HANA system. Depending on the deployment option you selected during the installation of SAP Customer Activity Repository, Analytics Authorization Assistant accesses authorization tables as follows:

Deployment Option	Table Access
SAP Customer Activity Repository co-deployed with SAP ERP	Directly from the SAP ERP database schema (<code>SAP_ECC</code>) on the SAP HANA database
SAP Customer Activity Repository co-deployed with S/4HANA	Directly from the S/4HANA database schema (<code>SAP_S4H</code>) on the SAP HANA database

Deployment Option	Table Access
SAP Customer Activity Repository standalone	From tables replicated to a dedicated SAP Customer Activity Repository schema from the source SAP ERP or S/4HANA system

The query views available as part of the SAP HANA content for SAP Customer Activity Repository rely on the following SAP ERP / S/4HANA authorization objects, where applicable:

- M_IS_WERKS (Plant)
- M_IS_VTWEK (Distribution Channel)
- M_IS_VKORG (Sales Organization)
- M_IS_MAKTL (Material Group)

For more information about the Analytics Authorization Assistant in general, refer to SAP Note [1796718](#) and SAP Help Portal under https://help.sap.com/viewer/p/SAP_HANA_LIVE ► *Additional Information* ► *SAP HANA Live Authorization Assistant* ►.

Authorizations to Support Integration Scenarios

SAP Customer Activity Repository supports the following integration scenarios:

- Loss Prevention Analytics (LPA) (task [5001](#), SAP Standard Profile)
- Demand Management Foundation (DMF) sales reporting, provided through task processing (task [0050](#), SAP Standard Profile)
- Inventory Management (IM) goods movement reporting to ERP, provided through task processing (task [0017](#), SAP Standard Profile)
- Forecasting & Replenishment (F&R) sales reporting, provided through task processing (task [0020](#), SAP Standard Profile)
- Credit Card Settlement, provided through task processing (task [0015](#), SAP Standard Profile)
- Oil & Gas SSR Payment Card data processing in ERP, provided through task processing (task [0101](#), SAP Standard Profile)

To enable these integration scenarios, the SAP Activity Repository system communicates with other SAP systems using Remote Function Calls (RFCs). The authorization objects that are verified during this integration are listed in SAP Note [1940161](#).

Role and Authorization Concept for SAP Customer Activity Repository

The tables below show the standard roles and authorization objects that are used in the modules of SAP Customer Activity Repository.

Standard Roles for SAP Customer Activity Repository

The table below shows the standard roles that are used by SAP Customer Activity Repository and its modules (such as Demand Data Foundation, DDF).

Standard Roles

Role	Description
/POSDW/ADMINISTRATOR	<p>Performs administrative activities that should not be executed by regular users. These include deleting data and reconstructing index records.</p> <ul style="list-style-type: none"> • Cross-application Authorization Objects (AAAB): <ul style="list-style-type: none"> ◦ Transaction Code Check at Transaction Start S_TCODE field TCD has values: /POSDW/DELE, /POSDW/IDIS, /POSDW/IMG, /POSDW/ODIS, /POSDW/PDIS, /POSDW/QDIS, /POSDW/QMON, /POSDW/REFI, /POSDW/REFQ, /POSDW/REFT • Basis: Administration (BC_A): <ul style="list-style-type: none"> ◦ Cross Client Table Maintenance S_TABU_CLI field CLII has value: 'X' - Allowed: Maintenance of cross-client tables ◦ Table Maintenance (via standard tools such as SM30) S_TABU_DIS field ACTVT has values: 02 - Change 03 - Display • Basis - Central Functions (BC_Z): <ul style="list-style-type: none"> ◦ ALV Standard Layout S_ALV_LAYO field ACTVT has value: 23 - Maintain • SAP Point-Of-Sale Data Transfer and Audit: <ul style="list-style-type: none"> ◦ Authorizations for Outbound Processing in PIPE W_POS_AGGP field /POSDW/OAC has value: 16 ◦ Authorizations for Aggregation in PIPE W_POS_AGGR field /POSDW/AAC has values: 01, 02 ◦ Authorizations for PIPE-related tasks W_POS_STAT field /POSDW/SAC has value: 01 ◦ Authorizations for Data on POS Transactions W_POS_TRAN field /POSDW/PAC has values: 01, 03, 06, 24, 31, 32, 34

Role	Description
/POSDW/SALES_AUDIT	<p>Performs the daily monitoring of the POS inbound data, including analyses and evaluations.</p> <ul style="list-style-type: none"> • Cross-application Authorization Objects (AAAB): <ul style="list-style-type: none"> ◦ Transaction Code Check at Transaction Start S_TCODE field TCD has values: /POSDW/IDIS, /POSDW/MON0, /POSDW/MON1, /POSDW/MON2, /POSDW/PDIS • Point-Of-Sale Data Transfer and Audit: <ul style="list-style-type: none"> ◦ Authorizations for credit card numbers in the POS Inbound Processing Engine (PIPE) W_POS_CCNR fields have value: * ◦ Authorizations for PIPE-related tasks W_POS_STAT fields have value: * ◦ Authorizations for Data on POS Transactions W_POS_TRAN field /POSDW/PAC has values: 01, 02, 03
/POSDW/SAP_QUERY_TRAN_S_RFC	<p>Role with RFC authorization for query of POS transactions. This role contains all authorizations that are necessary to query POS transactions via the RFC module /POSDW/SALES_QUERY_RFC. It also contains all authorizations that are necessary to post the processing confirmation via the RFC module /POSDW/CONFIRM_AGGR_PACKS_ARFC.</p> <ul style="list-style-type: none"> • Basis and Administration (BC_A): <ul style="list-style-type: none"> ◦ Auth. Check for RFC access S_TCODE field: <ul style="list-style-type: none"> ◦ ACTVT has value: 16 - Execute ◦ RFC_NAME has values: /POSDW/CONFIRM_AGGR_PACK, /POSDW/SALES_QUERY_API, ARFC, ERFC ◦ RFC_TYPE has value: FUGR

Role	Description
SAP_ISR_DDF_MASTER	<p data-bbox="596 371 1390 501">First PFCG role required for the Demand Data Foundation (DDF) module in SAP Customer Activity Repository. The role provides access to the following services (including the modeling and forecasting serves provided by Unified Demand Forecast, UDF):</p> <ul data-bbox="596 524 1018 1281" style="list-style-type: none"> • Check Mass Maintenance • Configure Load Balancing • Maintain Area of Responsibility • Locations • Location Hierarchy • Monitor Compressed Data • Maintain Product Locations • Monitor Exceptions • Monitor Imports • Placeholder Products • Process Inbound Staging Tables • Product • Product Groups • Purging Exceptions from the Database • Remove Time Series • Schedule Model and Forecasts • Search for Scheduled Jobs • Search Placeholder Products • Search Transportation Lane • Where Used Framework for Purging <p data-bbox="596 1303 1390 1370">For more information, execute transaction PFCG, call up the role, and consult the <i>Menu</i> tab.</p> <p data-bbox="596 1393 1390 1559">For service descriptions, see https://help.sap.com/viewer/p/CARAB >> <your release> > Application Help > SAP Customer Activity Repository > Demand Data Foundation > General Services > as well as >> Unified Demand Forecast > General Services >.</p>
SAP_ISR_DDF_READONLY_MASTER	<p data-bbox="596 1599 1390 1688">Second PFCG role required for the Demand Data Foundation (DDF) module in SAP Customer Activity Repository. The role provides read-only access to the same services as the SAP_ISR_DDF_MASTER role (see above).</p> <p data-bbox="596 1711 1390 1778">For more information, execute transaction PFCG, call up the role, and consult the <i>Menu</i> tab.</p> <p data-bbox="596 1800 1390 1973">For service descriptions, see https://help.sap.com/viewer/p/CARAB >> <your release> > Application Help > SAP Customer Activity Repository > Demand Data Foundation > General Services > as well as >> Unified Demand Forecast > General Services >.</p>

Role	Description
/POS DW/DPP_SECURITY	<p>PFCG Role that allows users to access tables with private and sensitive data about a subject. This role contains Data Protection and Privacy (DPP)-relevant authorization objects.</p> <ul style="list-style-type: none"> • Authorization Object S_TCODE <ul style="list-style-type: none"> Allows you to assign a transaction code to a user. <ul style="list-style-type: none"> ◦ /POS DW/DISP_DPD: Transaction code to run the <i>POS Transactions With Subject-Specific Data</i> report (/POS DW/PERSONAL_DATA_DISPLAY) ◦ SLG1: Transaction code for the standard application log • Authorization Object S_APPL_LOG <ul style="list-style-type: none"> Allows you to grant a user authorization to view or delete read access log entries generated by the POS Workbench, and execution information for the <i>POS Transactions with Subject-Specific Personal Data</i> report (/POS DW/PERSONAL_DATA_DISPLAY). • Authorization Object W_POS_DPPV <ul style="list-style-type: none"> Authorization object you use to give a user access to the following activities: <ul style="list-style-type: none"> ◦ 03: Viewing the masked value of personal data in the POS Workbench (/POS DW/MON0) and in the <i>Audit Report for Transaction Logs</i> (/POS DW/DISM) ◦ 04: Executing the POS Transactions with Subject-Specific Personal Data report (/POS DW/PERSONAL_DATA_DISPLAY) ◦ 23: Maintaining DPP-relevant settings in the following Customizing activities: <ul style="list-style-type: none"> ◦ ► <i>POS Data Management</i> ► <i>General Settings</i> ► <i>Define General Settings</i> ► ◦ ► <i>POS Data Management</i> ► <i>Field Selection Profile</i> ► ◦ ► <i>POS Data Management</i> ► <i>POS Transactions</i> ► <i>Define Tender Type</i> ► • Authorization Object W_POS_FSPR <ul style="list-style-type: none"> Authorization object you use to assign field selection profiles to users. Field selection profiles are used to determine which fields a user can see in the POS Workbench.

OData Service Roles for SAP Customer Activity Repository

The table below shows the roles required to use the OData services provided with SAP Customer Activity Repository:

OData Service Roles

OData Service	Role
MaterialQueryResults	sap.is.retail.car.int.roles::MaterialQuery
MaterialInternationalArtINmbrQueryResults	sap.is.retail.car.int.roles::MaterialInternationalArtINmbr-Query
RetailLocationQueryResults	sap.is.retail.car.int.roles::RetailLocationQuery
POSSalesQueryResults	sap.is.retail.car.int.roles::POSSalesQuery
MultiChannelSalesQueryResults	sap.is.retail.car.int.roles::MultiChannelSalesQuery
InventoryVisibilityQueryResults	sap.is.retail.car.int.roles::InventoryVisibilityQuery

i Note

OData services for the standalone SAP Fiori apps for SAP Customer Activity Repository

- **Analyze Forecast:**
For a list of the OData services for this app (SAP HANA XS and SAP Gateway ABAP services), see section *App Implementation: Analyze Forecast (Version 2)* in the *SAP Customer Activity Repository Application Help*.
- **Adjust Forecast:**
See section *App Implementation: Adjust Forecast* in the *SAP Customer Activity Repository Application Help*.

Standard Authorization Objects for SAP Customer Activity Repository

The table below shows the security-relevant authorization objects that are used by SAP Customer Activity Repository.

→ Recommendation

You can use transaction **SU21** to maintain authorization objects and to call up detailed information on each object. For example, to display the values for the `/DMF/AOR` object, select the object, choose *Display* from the context menu, and then *Permitted Activities*. To display more information about the `/POSDW/LPA` object, choose *Display Object Documentation*.

Standard Authorization Objects

Authorization Object	Authorization Object Description	Field	Value	Field Description
/POSDW/LPA	Authorization for Loss Prevention Analytics (LPA)	/POSDW/PTN	<i>ACTV: Active</i> <i>IACT: Inactive</i> <i>IACT: Inactive</i> <i>INIT: Initial</i> <i>NEW: New</i>	Pattern Status
/POSDW/PTR	Authorization for POS Transaction Data	/POSDW/STO	Selection from list of stores currently defined in customizing	Store
		/POSDW/PAC	<i>01 Add or Create</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i> <i>24 Archive</i> <i>25 Reload</i> <i>31 Create TREX Index</i> <i>32 Index TREX</i> <i>33 Read Index TREX</i> <i>34 Delete TREX Index</i> <i>41 Delete Unprocessed Sales Transactions</i> <i>42 Delete Log Entries</i> <i>56 Display Archive</i>	Activities for Authorization for POS Transactions
W_POS_ADMI	Authorization for Administrative Tasks	/POSDW/TAB		Table Name

Authorization Object	Authorization Object Description	Field	Value	Field Description
		/POSDW/ADC	<i>01 Assign tables to Placement Group Types</i> <i>02 Create Level 2 Range Partitions for TLOG tables</i> <i>03 Delete Level 2 Range Partitions for TLOG tables</i> <i>04 View Level 2 Range Partitions for TLOG tables</i> <i>05 Execute Data Aging for TLOG tables</i>	Activities for Authorization for Administrative Tasks
W_POS_AGGP	Authorizations for initiating outbound processing in PIPE	/POSDW/STO	Selection from list of stores currently defined in customizing	
		/POSDW/AGL	Selection from list of aggregation levels currently defined in customizing	Aggregation Level
		/POSDW/OTS	Selection from list of outbound tasks currently defined in customizing	Task for Outbound Processing
		/POSDW/OAC	<i>02 Change</i> <i>03 Display</i> <i>16 Process Outbound Task</i> <i>85 Reverse Outbound Task</i>	Activities for Outbound Processing in PIPE
W_POS_AGGR	Authorizations for performing aggregations in PIPE	/POSDW/STO	Selection from list of stores currently defined in customizing	Store
		/POSDW/AGL	Selection from list of aggregation levels currently defined in customizing	Aggregation Level

Authorization Object	Authorization Object Description	Field	Value	Field Description
		/POSDW/AAC	<i>01 Create Aggregate</i> <i>02 Change Aggregate</i> <i>03 Display Aggregate</i> <i>05 Close Aggregate</i> <i>06 Delete Aggregate</i> <i>24 Archive Aggregate</i> <i>25 Reload Aggregate</i> <i>56 Display Archive Aggregate</i>	Activities for Aggregation in PIPE
W_POS_CCNR	Authorizations for credit card numbers in PIPE	/POSDW/STO	Selection from list of stores currently defined in customizing	Store
		/POSDW/CAC	<i>02 Display Credit Card Number</i>	Activities for Authorization for Credit Card Numbers
W_POS_FSPR	Field Selection Profile	/POSDW/FSP	Selection from list of field selection profiles currently defined in customizing	
W_POS_STAT	Authorizations for PIPE-related tasks	/POSDW/STO	Selection from list of stores currently defined in customizing	Store
		/POSDW/SAC	<i>01 Process Task</i> <i>02 Reject Task</i> <i>03 Prepare Task for Processing</i>	Activities for Authorization for Task Status
		/POSDW/TAS	Selection from list of tasks currently defined in customizing	Task Code
W_POS_TIBQ	Authorizations for performing Inbound Queue operations in PIPE	/POSDW/STO	Selection from list of stores currently defined in customizing	Store

Authorization Object	Authorization Object Description	Field	Value	Field Description
		/POSDW/IAC	01 Create 02 Change 03 Display 06 Delete 16 Process	Activities for TIBQ Authorization
W_POS_TRAN	Authorizations for changing data in POS transactions	/POSDW/PAC	Selection from list of stores currently defined in customizing	Store
		/POSDW/PAC	01 Add or Create 02 Change 03 Display 06 Delete 24 Archive 25 Reload 31 Create TREX Index 32 Index TREX 33 Read TREX Index 34 Delete TREX Index 41 Delete Unprocessed Sales Transactions 42 Delete Log Entries 56 Display Archive	Activities for Authorization for POS Transactions
W_POS_UNPR	Used to validate whether a user can view unprocessed transactions for a store	/POSDW/PLT	4-character customer-defined value	Site number
		/POSDW/UAC	03 Display data	Activities permitted by the authorization
B_CCSEC	Unmasked display of credit card numbers	ACTVT	03 Display 06 Delete 71 Analyze	Activity

Authorization Object	Authorization Object Description	Field	Value	Field Description
W_POS_DPPV	Authorization to view sensitive data	/POSDW/DPP	<p><i>03 Display Masked Value</i></p> <p><i>04 Display POS Transactions with Subject-Specific Personal Data</i></p> <p><i>23 Maintain Field Selection Profile</i></p>	
CA_POWL	Authorizations for the <i>Personal Object Worklist (POWL)</i> iViews for the DDF POWL applications.	<ul style="list-style-type: none"> POWL_APPID POWL_CAT POWL_LSEL POWL_QUERY POWL_RA_AL POWL_TABLE 		<ul style="list-style-type: none"> Application ID Activity Authority state Activity Authority state Authority state
S_START	Used when checking the start authorization for particular TADIR objects (such as Web Dynpro applications).	<p><i>Object Name</i></p> <p><i>Object Type</i></p> <p><i>Program ID</i></p>	<p>/DMF/* and /PRM/* POWL</p> <p>WDYA</p> <p>R3TR</p>	
<div style="border: 1px solid orange; padding: 5px; background-color: #f0f0f0;"> <p>⚠ Caution</p> <p>Do not use this authorization object directly in your own coding. It can only be used through the CL_START_AUTH_CHECK class.</p> </div> <p>For more information about the start authorization check for program objects with object catalog entries, see SAP Note 1413011.</p>				
S_TCODE	Transaction check at transaction start.	TCD	<p>Report /DMF/TS_DELETE</p> <p>RSM37</p> <p>SM37</p>	

Authorization Object	Authorization Object Description	Field	Value	Field Description
/DMF/AOR	Authorization for the <i>Maintain Area of Responsibility (AOR)</i> service.	ACTVT	01 Create or generate 02 Change 03 Display 06 Delete	Activity
/DMF/CANN	Authorization for <i>Cannibalization Pairs</i> .	ACTVT	02 Change 06 Delete	Activity
/DMF/CLSTS	Authorization for <i>Location Cluster Sets</i> .	ACTVT	01 Add or Create 02 Change 03 Display 06 Delete	Activity
/DMF/CM_AT	Authorization to assign attributes.	ACTVT	01 Create or generate 02 Change 03 Display 06 Delete	Activity
/DMF/CM_IM	Authorization to define images.	ACTVT	02 Change 03 Display 06 Delete	Activity
/DMF/DISCH	Authorization for the <i>Distribution Chain</i> object.	ACTVT /DMF/SOCHK /DMF/CHCHK	01 Create or generate 02 Change 03 Display 06 Delete	Activity Internal Organizational Unit Identifiers
/DMF/DMDTS	Authorization to access demand time series data, including any business intelligence (BI) interfaces that would be sending point-of-sale (POS) data or generic consumption data.	ACTVT	01 Create or generate 02 Change 03 Display 06 Delete	Activity

Authorization Object	Authorization Object Description	Field	Value	Field Description
/DMF/EWB	Authorization for the exception handling framework.	ACTVT	01 Create or generate 02 Change 03 Display 32 Save 33 Read	Activity
/DMF/FCANA	Authorization to access forecasting analytics.	ACTVT	16 Execute 71 Analyze	Activity
/DMF/FCSTS	Authorization for the <i>Forecast</i> object.	ACTVT	02 Change 03 Display 06 Delete 16 Execute	Activity
/DMF/IMAGE	Authorization for the <i>Image</i> object.	ACTVT	01 Create or generate	Activity
/DMF/INV	Authorization for the <i>Inventory</i> object.	ACTVT	01 Create or generate 02 Change 03 Display 06 Delete	Activity
/DMF/LANE	Authorization for the <i>Transportation Lane</i> object.	ACTVT	01 Create or generate 02 Change 03 Display 06 Delete	Activity
/DMF/LBUI	Authorization for the <i>Configure Load Balancing</i> service and user interface for the DDF server configuration.	ACTVT	01 Create or generate 02 Change 03 Display 06 Delete 32 Save	Activity
/DMF/LOC	Authorization for the <i>Location</i> object.	ACTVT	01 Create or generate 02 Change 03 Display 06 Delete	Activity

Authorization Object	Authorization Object Description	Field	Value	Field Description
/DMF/LOCHR	Authorization for the <i>Location Hierarchy</i> object.	ACTVT	<i>01 Create or generate</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i>	Activity
/DMF/ME	Authorization for the <i>Monitor Exceptions</i> service.	ACTVT	<i>01 Create or generate</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i>	Activity
/DMF/MI	Authorization check for the <i>Monitor Imports</i> service.	ACTVT	<i>01 Create or generate</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i>	Activity
/DMF/OFFR	Authorization object for maintaining offers.	ACTVT	<i>01 Add or Create</i> <i>02 Change</i> <i>06 Delete</i> <i>23 Maintain</i> <i>37 Accept</i> <i>43 Release</i> <i>48 Simulate</i> <i>61 Export</i> <i>D1 Copy</i> <i>FA Cancel</i>	Activity
/DMF/OFRSO	Internal organizational unit identifiers for the distribution channel and the sales organization.	<ul style="list-style-type: none"> • /DMF/CHCHK • /DMF/SOCHK 	<i>01 Create or generate</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i> <i>37 Accept</i> <i>61 Export</i> <i>78 Assign</i>	Activity

Authorization Object	Authorization Object Description	Field	Value	Field Description
/DMF/OPUI	Authorization to access the user interface of the <i>Schedule Model and Forecasts</i> service.	ACTVT	<i>03 Display</i> <i>16 Execute</i>	Activity
/DMF/PHP	Authorization for the <i>Placeholder Product</i> object.	ACTVT	<i>01 Create or generate</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i>	Activity
/DMF/PLNCG	Authorization for the <i>Planning Configuration</i> object.	ACTVT	<i>03 Display</i> <i>23 Maintain</i>	Activity
/DMF/PROD	Authorization for the <i>Product</i> object.	ACTVT	<i>01 Create or generate</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i> <i>61 Export</i>	Activity
/DMF/PRDHR	Authorization for the <i>Product Hierarchy</i> object.	ACTVT	<i>01 Create or generate</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i> <i>61 Export</i>	Activity
/DMF/PRDLC	Authorization for the <i>Product Location</i> object.	ACTVT	<i>01 Create or generate</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i>	Activity
/DMF/PURCH	Authorization for the <i>Purchase Order</i> object.	ACTVT	<i>01 Create or generate</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i>	Activity
/DMF/PURGE	Authorization to purge USER_ID in transactions.	ACTVT	<i>51 Initialize</i>	Activity

Authorization Object	Authorization Object Description	Field	Value	Field Description
/DMF/SEAS	Authorization for the <i>Season</i> object.	ACTVT	<i>01 Add or Create</i> <i>06 Delete</i>	Activity
/DMF/SLSH	Authorization for the <i>Sales History</i> object.	ACTVT	<i>02 Change</i> <i>03 Display</i> <i>06 Delete</i>	Activity
/DMF/STAGE	Authorization for deleting staging objects.	ACTVT	<i>06 Delete</i>	Activity
/DMF/UDIF	Authorization for the <i>User DIF</i> object.	ACTVT	<i>02 Change</i> <i>06 Delete</i>	Activity
/DMF/UFRFC	Authorization for Unified Demand Forecast Forecasting Remote Function Call	ACTVT	<i>16 Execute</i>	Activity
/DMF/UGEN	Authorization for Unified Demand Forecast Generic.	ACTVT	<i>16 Execute</i>	Activity
/DMF/UMRFC	Authorization for Unified Demand Forecast Modeling Remote Function Call.	ACTVT	<i>16 Execute</i>	Activity
/DMF/UOPUI	Unified Demand Forecast Modeling and Forecasting execution authorization.	ACTVT	<i>16 Execute</i>	Activity
/DMF/UTSDL	Authorization for <i>Unified Demand Forecast</i> access to TS_DELETE.	ACTVT	<i>16 Execute</i>	Activity
/DMF/VDRDL	Authorization for <i>Vendor Fund</i> object.	ACTVT	<i>01 Add or Create</i> <i>02 Change</i> <i>03 Display</i> <i>06 Delete</i> <i>61 Export</i> <i>78 Assign</i>	Activity

Authorization Object	Authorization Object Description	Field	Value	Field Description
/DMF/WS	Authorization for <i>Wholesale Sales</i> object.	ACTVT	<i>O2 Change</i>	Activity

Standard Roles for On-Shelf Availability

The table below shows the standard roles that are used by the On-Shelf Availability (OSA) functionality in SAP Customer Activity Repository. These roles are required in addition to the technical role for SAP Gateway.

Standard Roles

Role	Description	Authorization Objects/Fields
/OSA/MANAGER	Permissions assigned to store managers when they log on.	<ul style="list-style-type: none"> /OSA/STOR:OSA/STORE, ACTVT /OSA/DEPT:OSA/AREA, OSA/STORE, ACTVT /OSA/PROD:OSA/AREA, OSA/STORE, ACTVT
/OSA/EMPLOYEE	Permissions assigned to store employees when they log on.	<ul style="list-style-type: none"> /OSA/STOR:OSA/STORE, ACTVT /OSA/DEPT:OSA/AREA, OSA/STORE, ACTVT /OSA/PROD:OSA/AREA, OSA/STORE, ACTVT
/OSA/ADMINISTRATOR	Permissions for administrative activities: <ul style="list-style-type: none"> Dispatching of the OSA algorithm Archiving the status log data 	<ul style="list-style-type: none"> /OSA/ADM: /OSA/ADM_A

External Roles Specific to Loss Prevention Analytics

The table below shows the **external** roles, that is, roles defined outside of the SAP Customer Activity Repository application, that are only used if you are implementing the Loss Prevention Analytics functionality.

For more information on integrating SAP Customer Activity Repository with the existing Loss Prevention Analytics (LPA) business process of the Store Analytics business scenario, see SAP Note [2010774](#).

External Roles

Role	Description
SAP_BW_LPA_LPO	<p>Performs daily monitoring of point-of-sale activities for the purposes of investigating potential fraudulent activities.</p> <p>For more information, see https://help.sap.com/viewer/p/BI_CONTENT >> <Your version of SAP NetWeaver BI Content> > Application Help > SAP Library > BI Content > Industry Solutions > Trading Industries > Retail Trade > Store Analytics > Loss Prevention Analytics > Roles > Loss Prevention Officer >.</p> <ul style="list-style-type: none"> • Cross-application Authorization Objects (AAAB): <ul style="list-style-type: none"> ◦ Authorization Check for RFC Access <ul style="list-style-type: none"> S_RFC field ACTVT has value: 16 S_RFC field RFC_NAME has values: RFC1, RRMX, RRXWS, RRY1, RSAH, RSBOLAP_BICS, RSBO-LAP_BICS_CONSUMER, RSBOLAP_BICS_PRO-VIDER, RSBOLAP_BICS_PROVIDER_VAR, RSFEC, RSMENU RSOBJS_RFC_INTERFACE, RSOD_BIRM, RSRCI_LOCAL_VIEW, RSR_XLS_RFC, RSWAD, RSWRTEMPLATE, RS_BEX_REPORT_RFC, RS_IGS, RZX0, RZX2, SDIFRUNTIME, SM02, SMHB, SRFC, SUNI, SUSO, SYST, SYSU S_RFC field RFC_TYPE has value: FUGR ◦ Transaction Code Check at Transaction Start <ul style="list-style-type: none"> S_TCODE field TCD has values: RRMX • Basis: Administration (BC_A): <ul style="list-style-type: none"> ◦ C calls in ABAP programs <ul style="list-style-type: none"> S_C_FUNCT field ACTVT has value: 16 - Execute S_C_FUNCT field CFUNCNAME has value: * S_C_FUNCT field PROGRAM has value: * • Basis - Central Functions (BC_Z): <ul style="list-style-type: none"> ◦ Authorizations for Accessing Documents <ul style="list-style-type: none"> S_BDS_D field ACTVT has value: * S_BDS_D field LOIO_CLASS has value: * ◦ Authorizations for Document Set <ul style="list-style-type: none"> S_BDS_DS field ACTVT has value: * S_BDS_DS field ACTVT has value: BW_* S_BDS_DS field ACTVT has value: OT - Other Objects ◦ Authorization Object for Sending <ul style="list-style-type: none"> S_OC_SEND field COM_MODE has value: * S_OC_SEND field NUMBER has value: * • Business Information Warehouse (RS) <ul style="list-style-type: none"> ◦ BI Authorizations in Role

Role	Description
	<p>S_RS_AUTH field BIAUTH has value: LOCA-TIO_AUTH</p> <ul style="list-style-type: none"> ○ BEx Broadcasting Authorization to Schedule <ul style="list-style-type: none"> S_RS_BCS field ACTVT has value: * S_RS_BCS field RS_EVID has value: * S_RS_BCS field RS_EVTYPE has value: * S_RS_BCS field RS_OBJID has value: * S_RS_BCS field RS_OBJTYPE has value: * ○ Business Explorer - Components <ul style="list-style-type: none"> S_RS_COMP field ACTVT has values: 01, 02, 03, 06, 16, 22 S_RS_COMP field RSINFOAREA has value: * S_RS_COMP field RSINFCUBE has value: * S_RS_COMP field RSZCOMPID has value: * S_RS_COMP field RZCOMPPTP has values: CKF, REP, RKF, STR ○ Data Warehousing Workbench - InfoObject <ul style="list-style-type: none"> S_RS_IOBJ field ACTVT has value: * S_RS_IOBJ field RSIOBJ has value: * S_RS_IOBJ field RSIOBJCAT has value: * S_RS_IOBJ field RSIOBJPART has value: * ○ Data Warehousing Workbench - Aggregation Level <ul style="list-style-type: none"> S_RS_ALVL field ACTVT has value: 03 S_RS_ALVL field RSALVLOBJ has value: * S_RS_ALVL field RSINFOAREA has value: * S_RS_ALVL field RSPLSALVL has value: * ○ Data Warehousing Workbench - MultiProvider <ul style="list-style-type: none"> S_RS_MPRO field ACTVT has value: 03 S_RS_MPRO field RSMPROOBJ has value: * S_RS_MPRO field RSINFOAREA has value: * S_RS_MPRO field RSMPRO has value: * ○ Data Warehousing Workbench - InfoSet <ul style="list-style-type: none"> S_RS_ISET field ACTVT has value: 03 S_RS_ISET field RSISETOBJ has value: * S_RS_ISET field RSINFOAREA has value: * S_RS_ISET field RSINFOSET has value: * ○ Business Explorer - Variants in Variable Screen <ul style="list-style-type: none"> S_RS_PARAM field ACTVT has value: * S_RS_PARAM field PARAMNM has value: *

2.4.2 Authorization Requirements for Unified Demand Forecast

Setting up the UDF authorizations is mandatory for SAP Customer Activity Repository and also for the consuming applications. Because of this, the steps are described in the common guides for SAP Customer Activity Repository applications bundle.

See the following guides on SAP Help Portal at <https://help.sap.com/viewer/p/CARAB>:

- For new installations, see the *Common Installation Guide*, section *Set Up Authorizations for Unified Demand Forecast*.
- For upgrade scenarios, see the *Common Installation Guide*, section *Verify Authorizations for Unified Demand Forecast*.

2.4.3 Authorization Requirements for Demand Planning SAP Fiori Apps

In addition to the roles and authorizations required for SAP Customer Activity Repository and Unified Demand Forecast, there is a `PF00` role and several authorization objects for working with the demand planning Fiori apps *Adjust Forecast* and *Manage Demand Influencing Factors*.

For the forecast simulation functionality based on DIF assignments in the *Manage Demand Influencing Factors* app, general roles and authorizations for background processing are required. To start the simulation, users need authorizations to:

- Set up and run jobs for demand modeling and demand forecasting. For more information, see the section on scheduling of model and forecast under *Unified Demand Forecast* in the application help of SAP Customer Activity Repository.
- For **releasing their own batch jobs** for background processing. For more information, please refer to the documentation of the roles and authorizations for background processing provided with the SAP NetWeaver platform.

Roles

The table shows the role that is used by the demand planning apps.

Standard Role

Role	Description
/DMF/DPL	This role allows
Demand Planner (Retail)	<ul style="list-style-type: none"> • Displaying and creating forecast corrections in the <i>Adjust Forecast</i> app. • Forward navigation from the <i>Analyze Forecast</i> to the <i>Adjust Forecast</i> and the <i>Manage Demand Influencing Factors</i> SAP Fiori apps. • Deletion of data from forecast correction tables. • Displaying and creating DIF assignments in the <i>Manage Demand Influencing Factors</i> app. • Deletion of data from the DIF assignment tables.

Authorization Objects for Demand Planning Fiori Apps

Authorization Object	Activities	Description
/DMF/DPL	16 <i>Execute</i>	<p>With this authorization object, the system checks the authorization to</p> <ul style="list-style-type: none"> • Create and display forecast corrections in the SAP Fiori app <i>Adjust Forecast</i> • Navigate forward from the <i>Analyze Forecast</i> to the <i>Adjust Forecast</i> SAP Fiori app. • Create and display DIF assignments in the SAP Fiori app <i>Manage Demand Influencing Factors</i>
/DMF/CLSFC	01 <i>Add or Create</i> 02 <i>Change</i> 03 <i>Display</i> 06 <i>Delete</i>	<p>Controls the maintenance of classification values for forecast corrections in the <i>Forecast Correction Classification</i> app.</p> <p>Needed for transaction /DMF/FCC_MAINT_CLSFC.</p>
/DMF/RULE	01 <i>Add or Create</i> 02 <i>Change</i> 03 <i>Display</i> 06 <i>Delete</i>	<p>Controls the maintenance of overlapping rules in the <i>Forecast Correction Overlapping Rules</i> app.</p> <p>Needed for transaction /DMF/FCC_MAINT_RULES.</p>
/DMF/DIFLB	01 <i>Add or Create</i> 02 <i>Change</i> 03 <i>Display</i> 06 <i>Delete</i>	<p>Controls the maintenance of the demand influencing factor (DIF) definitions in the <i>Demand Influencing Factors Library</i> app.</p> <p>Needed for transaction /DMF/DIF_LIBRARY.</p>

Authorization Object	Activities	Description
/DPL/FCC_R	16 <i>Execute</i>	Controls the deletion of data from forecast correction tables. Needed for report /DPL/REORG_FCC_TABLES <i>Reorganization of Forecast Corrections</i> .
/DPL/FCC_D	16 <i>Execute</i>	Controls the deletion of data from forecast correction draft tables. Needed for report /DPL/REORG_DRAFT_TABLES <i>Forecast Correction: Reorganization of Draft Tables</i> .
/DPL/DIF_R	16 <i>Execute</i>	Controls the deletion of data from the DIF assignment tables. Needed for report /DPL/REORG_DIF_TABLES <i>Reorganization of DIF Assignment Tables (*MAIN/*OCC/*PRD/*LOC)</i> .
/DPL/DIF_D	16 <i>Execute</i>	Controls the deletion of draft data from the DIF assignment tables. Needed for report /DPL/REORG_DIF_DRAFT_TABS <i>DIF Assignments: Reorganization of Draft Tables</i> .

2.4.4 Authorization Requirements for Omnichannel Article Availability and Sourcing (OAA)

There are no OAA-specific PFCG roles; however, there are a number of OAA-specific authorization objects both in SAP Customer Activity Repository and in SAP S/4HANA or SAP Retail. To be able to run the OAA functionality, you need to create 3 technical users, 2 administrator users, 1 SAP HANA database user, and 1 or more business users for the SAP Fiori apps.

Roles

There are no OAA-specific PFCG roles.

Authorization Objects in SAP Customer Activity Repository

Authorization class: `OAA` *Authorization Class for Omnichannel Article Availability*

Authorization Object	Activities	Description
/OAA/ADMIN	16 <i>Execute</i>	Controls execution of administrative tasks for OAA. Needed to execute reports /OAA/CREATE_TRIGGERS and /OAA/CHECK_SYSTEM_SETUP.
/OAA/ATP	16 <i>Execute</i>	Controls execution of the ATP calculation (access to ATP snapshot and to availability information from Inventory Visibility, reconciliation of temporary reservations, aggregation of availability schedule lines). Needed for reports /OAA/ATP_DELTA_CLEANER (SAP CAR) or OAA_CLEAN_DELTA_TABLE (SAP S/4HANA 1909 only).
/OAA/PREC	01 <i>Create or generate</i> 02 <i>Change</i> 03 <i>Display</i> 06 <i>Delete</i>	Controls generation and replication of the ATP snapshot as well as deletion of ATP snapshot entries. Needed for the following reports: <ul style="list-style-type: none"> • /OAA/ATP_SNP_CALC • /OAA/ATP_CALL_PRECALC • /OAA/ATP_VENDOR_CALC • /OAA/ATP_SNAPSHOT_DELETION
/OAA/RESV	01 <i>Create or generate</i> 02 <i>Change</i> 03 <i>Display</i> 06 <i>Delete</i>	Controls access to temporary reservations. The 06 <i>Delete</i> activity is needed for the following reports: <ul style="list-style-type: none"> • /OAA/ATP_RESV_DELETION • /OAA/ATP_OUTDATED_RESV_CLEANUP
/OAA/SRC_D	16 <i>Execute</i>	Controls deletion of OAA database entries for outdated sources. Needed for report /OAA/SOURCE_DELETION.
/OAA/SRC	16 <i>Execute</i> 71 <i>Analyze</i>	Controls execution of sourcing and analysis of sourcing results.
/OAA/RSI	01 <i>Create or generate</i> 02 <i>Change</i> 06 <i>Delete</i> 16 <i>Execute</i>	Controls replication of rough stock indicators. Needed for reports /OAA/ATP_RSI_GENERATION and /OAA/ATP_RSI_GENERATION_SC.
/OAA/NETW	16 <i>Execute</i>	Controls access to business object /OAA/I_NET_NETWORK. This is required for data maintenance in the <i>Manage Sourcing Networks</i> SAP Fiori app.

Authorization Object	Activities	Description
/OAA/SRCST	16 <i>Execute</i>	Controls access to business object /OAA/I_SRC_STRATEGY. This is required for data maintenance in the <i>Manage Sourcing Strategies</i> SAP Fiori app.
/OAA/SC	16 <i>Execute</i>	Controls access to business object /OAA/I_CHANNEL. This is required for data maintenance in the <i>Manage Sales Channels</i> SAP Fiori app.
/OAA/SRC_A	16 <i>Execute</i>	Controls access to business object /OAA/I_SOURCE_PROP. This is required for data maintenance in the <i>Manage Sources</i> SAP Fiori app. The OAA_SOURCE authorization field allows you to restrict the list of sources in the app to the sources that the user (store manager or DC manager) is responsible for.
/OAA/SRC_T	07 <i>Activate, generate</i> 06 <i>Delete</i>	Controls tracing of sourcing information. Needed to activate the sourcing trace and for report /OAA/SRC_TRACE_DELETION.

Authorization Objects in SAP S/4HANA or SAP Retail

Authorization class: WG *Retailing*

Authorization Object	Activities	Description
W_OAA_SITE	16 <i>Execute</i>	Controls replication of sites data via IDoc. Needed for reports OAA_IDOC_SITE_REPLICATION and OAA_CREATE_CEOCODING.
W_OAA_PREC	16 <i>Execute</i> 06 <i>Delete</i>	Controls execution of the parallelized ATP run, generation of the ATP snapshot and replication of the snapshot to SAP Customer Activity Repository. Needed for reports /OAA/ATP_CALL_PRECALC and /OAA/ATP_SNP_CALC. These reports are executed in SAP Customer Activity Repository and call into SAP S/4HANA or SAP Retail via RFC. Needed also for reports /OAA/ATP_DELTA_CLEANER (SAP CAR) or OAA_CLEAN_DELTA_TABLE (SAP S/4HANA 1909 only).

Authorization Object	Activities	Description
W_OAA_VEND	01 <i>Create or generate</i> 03 <i>Display</i> 06 <i>Delete</i>	<p>Controls access to the uploaded vendor stock, determination of the available quantities for articles delivered by vendors and replication of the result to SAP Customer Activity Repository.</p> <p>Needed for reports /OAA/ATP_VENDOR_CALC and /OAA/ATP_SNP_CALC. These reports are executed in SAP Customer Activity Repository and call into SAP S/4HANA or SAP Retail via RFC.</p> <p>Needed also for reports OAA_VEND_STOCK_DELETION and /OAA/ATP_DELTA_CLEANER (SAP CAR) or OAA_CLEAN_DELTA_TABLE (SAP S/4HANA 1909 only).</p>

Required Users

System	Type of User	Description	User Parameters	Authorizations
SAP Customer Activity Repository	Technical user	<p>For communication between SAP Commerce and SAP Customer Activity Repository</p> <p>Calls the ATP REST API, reads the ATP snapshot, executes sourcing, creates temporary reservations.</p> <p>This user is created in SAP Customer Activity Repository (transaction SU01) and is entered in the Backoffice application of SAP Commerce, under SAP Integration > HTTP Destination > HTTP Destination > Authentication Type.</p>	<p>For sourcing strategy determination:</p> <ul style="list-style-type: none"> /OAA/SRC_PAR_SG /OAA/SRC_PAR_WP /OAA/SRC_PAR_WT 	<p>/OAA/ATP <i>Execute</i></p> <p>/OAA/PREC <i>Display</i></p> <p>/OAA/SRC <i>Execute</i></p> <p>/OAA/SRC_A <i>Execute</i></p> <p>/OAA/RESV <i>Create or generate / Change / Display / Delete</i></p>
SAP S/4HANA or SAP Retail	Technical user	<p>For communication between SAP S/4HANA or SAP Retail and SAP Customer Activity Repository</p> <p>Executes the ATP run.</p> <p>This user is created in SAP S/4HANA or SAP Retail (transaction SU01) and is entered in transaction SM59, in SAP Customer Activity Repository, for the corresponding ABAP connection on tab Logon & Security.</p>	<p>For traceability of the parallelized ATP run:</p> <p>W_OAA_JOB_TRACING</p>	<p>W_OAA_PREC <i>Execute</i></p>

System	Type of User	Description	User Parameters	Authorizations
SAP Customer Activity Repository	Technical user	Creates and updates the ATP snapshot in SAP Customer Activity Repository. This user is created in SAP Customer Activity Repository (transaction SU01) and is entered in transaction SM59, in SAP S/4HANA or SAP Retail, for the corresponding ABAP connection on tab Logon & Security .		/OAA/PREC Create or Generate / Change
SAP Customer Activity Repository	Administrator	Performs administrative tasks for OAA. Reports /OAA/CREATE_TRIGGERS and /OAA/CHECK_SYSTEM_SETUP		/OAA/ADMIN Execute
		Manually deletes ATP snapshot. Report /OAA/ATP_SNAPSHOT_DELETION		/OAA/PREC Delete
		Manually deletes temporary reservations. Report /OAA/ATP_RESV_DELETION		/OAA/RESV Delete
		Manually cleans up delta ATP tables. Report /OAA/ATP_DELTA_CLEANER		/OAA/ATP Execute W_OAA_PREC Delete W_OAA_VEND Delete
		Activates sourcing traces. Transaction /OAA/SRC_TRACE_ACT (Activate Sourcing Traces) Manually deletes sourcing traces. Report /OAA/SRC_TRACE_DELETION		/OAA/SRC_T Activate, generate / Delete
		Manually deletes OAA data related to sources that were deleted or archived in the SAP back end. Report /OAA/SOURCE_DELETION		/OAA/SRC_D Execute
		Manually replicates rough stock indicators. Reports /OAA/ATP_RSI_GENERATION and /OAA/ATP_RSI_GENERATION_SC		/OAA/RSI Create or generate / Change / Delete / Execute

System	Type of User	Description	User Parameters	Authorizations
		Manually generates and replicates ATP snapshot for DCs and vendors. Sales channel mode: report /OAA/ ATP_SNP_CALC OAA profile mode: reports /OAA/ ATP_CALL_PRECALC and /OAA/ ATP_VENDOR_CALC		W_OAA_PREC <i>Execute</i> W_OAA_VEND <i>Create or generate / Display</i>
		Manually upgrades data structures for sources, for the <i>Manage Sources</i> app. Report /OAA/SOURCE_UPGRADE		/OAA/SRC_A <i>Execute</i>
		If the reports are to be executed in batch mode, authorizations for the batch user must include those mentioned on the right.		
SAP S/4HANA or SAP Retail	Administrator	Manually replicates site data from SAP S/4HANA or SAP Retail to SAP Customer Activity Repository. Report OAA_IDOC_SITE_REPLICATION		W_OAA_SITE <i>Execute</i>
		Manually determines geocoordinates for OAA sources (SAP Retail only). Report OAA_CREATE_GEOCODING		W_OAA_SITE <i>Execute</i>
		Manually deletes vendor stock entries. Report OAA_VEND_STOCK_DELETION		W_OAA_VEND <i>Delete</i>
		If the reports are to be executed in batch mode, authorizations for the batch user must include those mentioned on the right.		
		Manually cleans up delta ATP tables. Report OAA_CLEAN_DELTA_TABLE (SAP S/4HANA 1909 only)		/OAA/ATP <i>Execute</i> W_OAA_PREC <i>Delete</i> W_OAA_VEND <i>Delete</i>

System	Type of User	Description	User Parameters	Authorizations
SAP HANA in SAP Customer Activity Repository	ABAP database user	<p>This is the generic database user specified for the connection from the SAP NetWeaver back-end server to the SAP HANA database. This user is required for the installation already.</p> <p>For activation of the OAA-related SAP HANA content during post-installation, this user needs the following additional privileges, with option "<i>Grantable to others</i>", on these schemas:</p> <p>On schema <code>_SYS_BIC</code>:</p> <ul style="list-style-type: none"> • Privilege <code>CREATE ANY</code> • Privilege <code>ALTER</code> <p>On schema <code><SAP Retail or SAP S/4HANA schema name></code>:</p> <ul style="list-style-type: none"> • Privilege <code>SELECT</code> <p>In addition, this user needs authorization to create database triggers in SAP Customer Activity Repository.</p> <p>Report <code>/OAA/CREATE_TRIGGERS</code></p>		-
SAP Customer Activity Repository	One or more business users for role <i>Omnichannel Manager</i>	Omnichannel managers maintain data in the SAP Fiori apps relevant for OAA and analyzes the success of sourcing in the online store.		<p><code>/OAA/NETW <i>Execute</i></code></p> <p><code>/OAA/SRCST <i>Execute</i></code></p> <p><code>/OAA/SC <i>Execute</i></code></p> <p><code>/OAA/SRC_A <i>Execute</i></code> (set parameter OAASOURCE to *)</p> <p><code>/OAA/SRC <i>Analyze</i></code></p>
SAP Customer Activity Repository	One or more business users for role <i>Store Manager</i> or <i>DC Manager</i>	Store managers and DC managers maintain data in the <i>Manage Sources</i> SAP Fiori app.		<p><code>/OAA/SRC_A <i>Execute</i></code> (for parameter OAASOURCE, select the sources that the respective manager or group of managers is responsible for)</p>

2.4.5 Authorization Requirements for Omnichannel Promotion Pricing (OPP)

OPP delivers the role `/ROP/OPP_ADMINISTRATOR` as a template. You can copy this template to your own role (or several roles), and add authorization values as required.

Roles

Role	Description
<code>/ROP/OPP_ADMINISTRATOR</code>	<p>This role performs the following administrative activities for OPP that are usually not done by normal users::</p> <ul style="list-style-type: none"> • Transforming offers into OPP promotions using the report <code>/ROP/R_OFFER_TRANSFORM</code>. • Displaying of the application log that is written during the transformation of offers into OPP promotions using, for example, the report <code>/ROP/R_OFFER_APPL_LOG</code>. • Executing the outbound processing of regular prices and OPP promotions with the Data Replication Framework (DRF). • Several deletion activities, for example, the deletion of the replication status information for OPP promotions using report <code>/ROP/R_DELETE_PROMO_REPLSTATUS</code>.

The transaction to transform offers into OPP promotions (`/ROP/OFFER_TRANSFORM`) does not use new authorization objects. Instead, it checks mainly the following authorization objects:

Authorization Object	Description
<code>S_TCODE</code>	The user must have this authorization to start transaction <code>/ROP/OFFER_TRANSFORM</code> .
<code>/DMF/OFRSO</code>	The user must have this authorization to display offers in the related sales organization and the related distribution channel.

2.5 Session Security Protection

To increase security and prevent access to the SAP logon ticket and security session cookie(s), we recommend activating secure session management.

We also highly recommend using SSL to protect the network communications where these security-relevant cookies are transferred.

Session Security Protection on the AS ABAP

To activate session security on the AS ABAP, set the corresponding profile parameters and activate the session security for the client(s) using the transaction SICF_SESSIONS.

For more information, a list of the relevant profile parameters, and detailed instructions, see *Activating HTTP Security Session Management on AS ABAP* in the AS ABAP security documentation.

2.6 Network and Communication Security

Your network infrastructure is extremely important in protecting your system.

Your network needs to support the communication necessary for your business and your needs without allowing unauthorized access. A well-defined network topology can eliminate many security threats based on software flaws (at both the operating system and application level) or network attacks such as eavesdropping. If users cannot log on to your application or database servers at the operating system or database layer, then there is no way for intruders to compromise the machines and gain access to the backend system's database or files. Additionally, if users are not able to connect to the server LAN (local area network), they cannot exploit well-known bugs and security holes in network services on the server machines.

The network topology for the SAP Customer Activity Repository application is based on the topology used by the SAP NetWeaver platform. Therefore, the security guidelines and recommendations described in the SAP NetWeaver Security Guide also apply to the SAP Customer Activity Repository. Details that specifically apply to the SAP Customer Activity Repository application are described here.

Communication Channel Security

The table below shows the communication paths used by SAP Customer Activity Repository, the protocol used for the connection, and the type of data transferred.

Communication Paths

Communication Path	Protocol Used	Type of Data Transferred	Data Requiring Special Protection
Front-end client using SAP GUI for Windows to application server	DIAG	All application data	Passwords, credit card information
Application server to third-party application	HTTPS	System ID, client, and host name	System information (host name), personal data, transactional data, and credit card information

Communication Path	Protocol Used	Type of Data Transferred	Data Requiring Special Protection
Document upload	HTTPS	XML document	Personal data, transactional data, and credit card information
Application server to application server	RFC	Application data	System information, personal data, transactional data, and credit card information
Application server to application server	IDoc	Application data records	Personal data, transactional data, and credit card information
Web service client to Web service provider	SOAP	XML document	Personal data, transactional data, and credit card information
Application server to external receiver	IDoc	Application data records	Omnichannel promotion pricing data, including regular prices and OPP promotions.

DIAG and RFC connections can be protected using Secure Network Communications (SNC). HTTP connections are protected using the Secure Sockets Layer (SSL) protocol. SOAP connections are protected with Web services security.

For more information, see *Transport Layer Security* the *SAP NetWeaver Security Guide*.

→ Recommendation

We strongly recommend using secure protocols (SSL, SNC) whenever possible.

For more information, see *Transport Layer Security* and *Web Services Security* in the *SAP NetWeaver Security Guide*.

Network Security

The network topology for SAP Customer Activity Repository is based on the topology used by the SAP NetWeaver platform. Therefore, refer to the following documentation for information on network security:

- SAP NetWeaver Security Guide
- SAP Supply Chain Management Security Guide
- SAP Supplier Relationship Management Security Guide
- SAP ERP Central Component Security Guide
- SAP S/4HANA Security Guide

- SAP Customer Relationship Management Security Guide
- SAP Marketing Security Guide

If you are implementing the Loss Prevention Analytics functionality, you should also refer to the following documentation:

- Security Guide for SAP NetWeaver BW
- Portal Security Guide

To locate the security guides listed above, go to SAP Help Portal (<https://help.sap.com/viewer/index>), choose your product and then choose Security Information. For example, https://help.sap.com/viewer/p/SAP_NETWEAVER_740 ► [Security](#) ► [SAP NetWeaver Security Guide](#) ►.

Ports

SAP Customer Activity Repository runs on SAP NetWeaver and uses the ports from the AS ABAP. For more information, see the topics for *AS ABAP Ports* in the corresponding [SAP NetWeaver Application Server ABAP Security Guide](#). For other components, for example, SAPinst, SAProuter, or the SAP Web Dispatcher, see also the document *TCP/IP Ports Used by SAP Applications*, which is located on SAP Community Network (SCN) at <http://scn.sap.com/community/security> under ► [Infrastructure Security](#) ► [Network and Communication Security](#) ►.

Communication Destinations

The incorrect configuration of users and authorizations for connection destinations can result in high security flaws. To ensure the proper configuration of users and authorizations, do the following:

- Choose the appropriate user type: Communication or System
- Assign only the minimum required authorizations to a user type
- Choose a secure and secret password for a user type
- Store only connection user logon data for System user types
- Choose trusted system functionality

Connection destinations are particularly important in SAP Customer Activity Repository for connecting incoming datasources and outgoing destinations. SAP Customer Activity Repository does not provide any pre-configured RFC destinations; these destinations are created by customers. Therefore, connection information (such as connection type, user name and password) is not defined directly within SAP Customer Activity Repository; it relies on references to system-defined and/or system-administered connections, for example, RFC destinations or Web service configurations.

You require RFC destinations to connect SAP and non-SAP systems to SAP Customer Activity Repository.

For information on how to set up secure RFC communications, see SAP Note [2008727](#).

If communication is to be accomplished with IDocs using Application Link Enabling (ALE), you may require additional ALE configurations to ensure that the applicable message types are correctly routed.

For inbound communication to SAP Customer Activity Repository, you must do the following:

- Define SAP Customer Activity Repository as a target destination within the source system, for example, as an RFC destination with a specific user identified.
- Define a user with the necessary authorizations for SAP Customer Activity Repository

For outbound communication from SAP Customer Activity Repository, you must do the following:

- Define all target destinations within SAP Customer Activity Repository, for example, as an RFC destination with a specific user identified for the target system.
- Configure SAP Customer Activity Repository Customizing as the target destinations.
- Define all users with the necessary authorizations on the target system(s).

The table below shows an overview of the communication destinations used by the SAP Customer Activity Repository application.

Connection Destinations

Destination	Delivered	Type	User, Authorizations	Description
Customer-defined in external system	No	RFC	<ul style="list-style-type: none"> • S_ICF (for client system) • S_RFC (for server system) • S_RFACL (for trusted systems only) • W_POS_TIBQ (Activity '01' Create) 	Inbound transaction data from BAPI call
Customer-defined through communication channel (either at runtime or configured for proxy/logical port) in external system	No	HTTP(S)	Web Service Authorization Objects: <ul style="list-style-type: none"> • S_SERVICE Web Service Roles: <ul style="list-style-type: none"> • SAP_BC_WEB-SERVICE_CONSUMER 	Inbound transaction data from Web Service call (from POS)
Customer-defined in external system	No	tRFC	<ul style="list-style-type: none"> • S_ICF (for client system) • S_RFC (for server system) • S_RFACL (for trusted systems only) • W_POS_TIBQ (Activity '01' Create) 	Inbound transaction data from IDOC through ALE (such as for SAP Retail, etc.)

Destination	Delivered	Type	User, Authorizations	Description
Customer-defined in Customizing	No	RFC	<p>RFC Authorization Objects:</p> <ul style="list-style-type: none"> • S_ICF (for client system) • S_RFC (for server system) • S_RFACL (for trusted systems only) <p>ALE Authorization Objects:</p> <ul style="list-style-type: none"> • B_ALE_RECV • B_ALE_REDU <p>Authorization Objects:</p> <ul style="list-style-type: none"> • W_POS_AGGP <p>Roles:</p> <ul style="list-style-type: none"> • /POSDW/ADMINISTRATOR • /POSDW/SALES_AUDIT 	Outbound transaction data from BAPI / Function Module resulting from Task Processing (such as for SAP ERP, SAP F&R, Credit Card Settlement, Payment Card, , etc.)
Customer-defined through communication channel (either at runtime or configured for proxy/logical port) of SAP Customer Activity Repository system	No	HTTP(S)	<p>Web Service Authorization Objects:</p> <ul style="list-style-type: none"> • S_SERVICE <p>Web Service Roles:</p> <ul style="list-style-type: none"> • SAP_BC_WEB-SERVICE_CONSUMER <p>Authorization Objects:</p> <ul style="list-style-type: none"> • W_POS_AGGP <p>Roles:</p> <ul style="list-style-type: none"> • /POSDW/ADMINISTRATOR • /POSDW/SALES_AUDIT 	Outbound transaction data from Web Service call resulting from Task Processing (such as for SAP CRM)

Destination	Delivered	Type	User, Authorizations	Description
Customer-defined in external system	No	tRFC	RFC Authorization Objects: <ul style="list-style-type: none"> • S_ICF (for client system) • S_RFC (for server system) • S_RFACL (for trusted systems only) Authorization Objects: <ul style="list-style-type: none"> • W_POS_TIBQ (Activity '01' Create) 	Outbound transaction data from IDOC resulting from Task Processing (such as for SAP Retail, etc.)

2.7 Internet Communication Framework Security

You should only activate those services that are needed for the applications running in your system. For the SAP Customer Activity Repository application (and specifically for the POS Data Transfer and Audit module), the following service is required:

Service	Description
POSTRANSACTERPBLKCRTRQ	Inbound POS Transactions Service

For Loss Prevention Analytics (LPA) services within the SAP NetWeaver Portal, the following services are required:

Service	Description
LPA_WDA_CASHIERLOOKUP	Cashier Lookup
LPA_WDA_TXN_VIEWER	Transaction Viewer
LPA_WDA_JOURNAL_VIEWER	Journal Viewer

You only need to activate these services if you are using LPA functionality. For more information, see SAP Note [1533599](#).

You activate these services using transaction SICF. If your firewall(s) use URL filtering, note the URLs used for the services and adjust your firewall settings accordingly.

For information about activating and deactivating ICF services, see *Activating and Deactivating ICF Services* in the *SAP NetWeaver Library* documentation.

For information about ICF security, see the *RFC/ICF Security Guide* within the *Security Guides for Connectivity and Interoperability Technologies* in the *SAP NetWeaver Security Guide*.

2.8 Data Storage Security

Data Storage

The SAP Customer Activity Repository application saves data in the SAP HANA database of the SAP system (configuration, master, transactional, and aggregation data). Data access for users is controlled through the standard SAP NetWeaver and SAP HANA authorization concepts (see the [Authorizations \[page 23\]](#) section).

The application makes use of data originating from other SAP systems (for example, SAP ERP, or SAP S/4HANA, and optionally SAP CRM or SAP Marketing). SAP Customer Activity Repository accesses data using SAP HANA read-only views included SAP HANA Content for SAP Customer Activity Repository, and optionally SAP HANA Live for SAP ERP. The data is protected through the implementation of the SAP HANA Live for Business Suite authorization concept, which relies on SAP HANA DB object and analytical privileges for users.

Data is not temporarily stored in the file system for any reason. For non-temporary data storage, see the subsequent section for information about file system storage for archived transactional and aggregation data.

Using Logical Path and File Names to Protect Access to the File System

The SAP Customer Activity Repository application can optionally save data in files in the file system (specifically for archiving purposes). Therefore, it is important to explicitly provide access to the corresponding files in the file system without allowing access to other directories or files (also known as directory traversal). This is achieved by specifying logical paths and file names in the system that map to the physical paths and file names. This mapping is validated at runtime and if access is requested to a directory (including subdirectories) that does not match a stored mapping, then an error occurs.

The following lists show the logical file names and paths used by the SAP Customer Activity Repository application and the programs to which these file names and paths apply:

Logical File Names Used in This Application

The following logical file names have been created in order to enable the validation of physical file names:

- ARCHIVE_DATA_FILE_POSDW
 - Programs using this logical file name and parameters used in this context:
 - Archiving object / POSDW/TL
 - Program / POSDW/ARCHIVE_READ
 - Program / POSDW/ARCHIVE_WRITE
 - Program / POSDW/ARCHIVE_DELETE
 - Program / POSDW/ARCHIVE_RELOAD
 - Parameters used in this context ('_' between parameters, and suffix of '_TL.ARCHIVE'):
 - < PARAM_1 >
 - < PARAM_3 >
 - < DATE >
 - < TIME >

- < PARAM_2 >
- ARCHIVE_DATA_FILE_POSDW2
 - Programs using this logical file name:
 - Archiving object /POSDW/AGG
 - Program /POSDW/ARCHIVE_READ_AGGREGATE
 - Program /POSDW/ARCHIVE_WRITE_AGGREGATE
 - Program /POSDW/ARCHIVE_DELE_AGGREGATE
 - Parameters used in this context ('_' between parameters, and suffix of '_AG.ARCHIVE'):
 - < PARAM_1 >
 - < PARAM_3 >
 - < DATE >
 - < TIME >
 - < PARAM_2 >
- ARCHIVE_DATA_FILE_POSDW_F
 - Programs using this logical file name:
 - Archiving object /POSDW/TLF
 - Program /POSDW/ARCHIVE_READ_HDB_F
 - Program /POSDW/ARCHIVE_WRITE_HDB_F
 - Program /POSDW/ARCHIVE_DELETE_HDB_F
 - Program /POSDW/ARCHIVE_RELOAD_HDB_F
 - Parameters used in this context ('_' between parameters, and suffix of '.ARCHIVE'):
 - < PARAM_1 >
 - < PARAM_3 >
 - < DATE >
 - < TIME >
 - < PARAM_2 >

Logical Path Names Used in This Application

The logical file names listed above all use the logical file path ARCHIVE_GLOBAL_PATH.

Activating the Validation of Logical Path and File Names

These logical paths and file names, as well as any subdirectories, are specified in the system for the corresponding programs. For downward compatibility, the validation at runtime is deactivated by default. To activate the validation at runtime, maintain the physical path using the transactions FILE (client-independent) and SF01 (client-specific). To find out which paths are being used by your system, you can activate the corresponding settings in the Security Audit Log.





For more information, see:

- *Logical File Names* in the *SAP NetWeaver Library*
- *Protecting Access to the File System* in the *SAP NetWeaver Application Server ABAP Security Guide*
- *Security Audit Log* in the *SAP NetWeaver Library*

Data Protection

The SAP Customer Activity Repository application does not support or require a Web Browser as its user interface, and therefore does not use cookies to store data on the front-end. Additionally, no data is stored on a client.

The application transactional data may contain sensitive data, in the form of credit card numbers, and so on, which are provided from outside systems. It is strongly recommended that all such data be encrypted at its source, remain encrypted when passed between systems, and remain encrypted within the SAP Customer Activity Repository's application database tables or file system. The following SAP Notes highlight historical product-related changes to support data encryption:

- [1151936](#) 
- [1053296](#) 
- [1041514](#) 
- [1032588](#) 

For business use-cases where the decryption of this type of data is required, specific authorizations are necessary and access is logged for auditing purposes. For more information, see the [Authorizations \[page 23\]](#) section.

2.9 Data Protection and Privacy

[Introduction \[page 62\]](#)

[Glossary \[page 63\]](#)

[Consent \[page 66\]](#)

[Read Access Logging \[page 66\]](#)

[Information Retrieval \[page 67\]](#)

[Deletion of Personal Data \[page 68\]](#)

[Change Log \[page 82\]](#)

[Enabling Data Protection and Privacy-Related Functionality \[page 83\]](#)

2.9.1 Introduction

Data protection is associated with numerous legal requirements and privacy concerns. In addition to compliance with general data protection and privacy acts, it is necessary to consider compliance with industry-specific legislation in different countries. SAP provides specific features and functions to support compliance with regard to relevant legal requirements, including data protection. SAP does not give any advice on whether these features and functions are the best method to support company, industry, regional, or country-specific requirements. Furthermore, this information should not be taken as advice or a recommendation regarding

additional features that would be required in specific IT environments. Decisions related to data protection must be made on a case-by-case basis, taking into consideration the given system landscape and the applicable legal requirements.

i Note

SAP does not provide legal advice in any form. SAP software supports data protection compliance by providing security features and specific data protection-relevant functions, such as simplified blocking and deletion of personal data. In many cases, compliance with applicable data protection and privacy laws will not be covered by a product feature. Definitions and other terms used in this document are not taken from a particular legal source.

⚠ Caution

The extent to which data protection is supported by technical means depends on secure system operation. Network security, security note implementation, adequate logging of system changes, and appropriate usage of the system are the basic technical requirements for compliance with data privacy legislation and other legislation.

i Note

For upgrade recommendations to support General Data Protection Regulation (GDPR) compliance, see SAP Note [2590321](#).

For more information on GDPR compliance, see <https://discover.sap.com/gdpr/en-us/index.html>.

Generic Fields

You need to make sure that no personal data enters the system in an uncontrolled or non-purpose related way, for example, in free-text fields, through APIs, or customer extensions. Note that these are not subject to the read access logging (RAL) example configuration.

2.9.2 Glossary

The following terms are general to SAP products. Not all terms may be relevant for this SAP product.

Term	Definition
Blocking	A method of restricting access to data for which the primary business purpose has ended.

Term	Definition
Business Purpose	The legal, contractual, or in other form justified reason for the processing of personal data to complete an end-to-end business process. The personal data used to complete the process is predefined in a purpose, which is defined by the data controller. The process must be defined before the personal data required to fulfill the purpose can be determined.
Consent	The action of the data subject confirming that the usage of his or her personal data shall be allowed for a given purpose. A consent functionality allows the storage of a consent record in relation to a specific purpose and shows if a data subject has granted, withdrawn, or denied consent.
Data Subject	Any information relating to an identified or identifiable natural person ("data subject"). An identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier, or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural, or social identity of that natural person.
Deletion	Deletion of personal data so that the data is no longer available.
End of business	Defines the end of active business and the start of residence time and retention period.
End of Purpose (EoP)	The point in time when the processing of a set of personal data is no longer required for the primary business purpose, for example, when a contract is fulfilled. After the EoP has been reached, the data is blocked and can only be accessed by users with special authorizations (for example, tax auditors).
End of Purpose (EoP) check	A method of identifying the point in time for a data set when the processing of personal data is no longer required for the primary business purpose . After the EoP has been reached, the data is blocked and can only be accessed by users with special authorization, for example, tax auditors.
Personal Data	Any information relating to an identified or identifiable natural person ("data subject"). An identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier, or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural, or social identity of that natural person.

Term	Definition
Purpose	The information that specifies the reason and the goal for the processing of a specific set of personal data. As a rule, the purpose references the relevant legal basis for the processing of personal data.
Residence Period	The period of time between the end of business and the end of purpose (EoP) for a data set during which the data remains in the database and can be used in case of subsequent processes related to the original purpose. At the end of the longest configured residence period, the data is blocked or deleted. The residence period is part of the overall retention period.
Retention Period	The period of time between the end of the last business activity involving a specific object (for example, a business partner) and the deletion of the corresponding data, subject to applicable laws. The retention period is a combination of the residence period and the blocking period.
Sensitive Personal Data	<p>A category of personal data that usually includes the following type of information:</p> <ul style="list-style-type: none"> • Special categories of personal data such as data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership and the processing of genetic data, biometric data, data concerning health, sex life or sexual orientation or personal data concerning bank and credit accounts • Personal data subject to professional secrecy • Personal data relating to criminal or administrative offenses • Personal data concerning insurances and bank or credit card accounts
Technical and Organizational Measures (TOM)	<p>Some basic requirements that support data protection and privacy are often referred to as technical and organizational measures (TOM). The following topics are related to data protection and privacy and require appropriate TOMs, for example:</p> <ul style="list-style-type: none"> • Access control Authentication features • Authorizations Authorization concept • Read access logging • Transmission control/communication security • Input control/change logging • Availability control • Separation by purpose Subject to the organizational model implemented and must be applied as part of the authorization concept.

2.9.3 Consent

Any personal data collected or processed must be linked to a specific, pre-defined purpose, such as the fulfilment of a contract or legal obligation. If there is no other legal basis for the lawful processing of personal data or - in some cases - if the data is to be sent to a third party, you must obtain consent from the data subject to use their personal data. SAP applications ask for consent of the data subject before collecting any personal data. In some cases, the data subject may also be the user. This SAP product provides functionality that allows data subjects to give and withdraw consent to collect and process their personal data. SAP assumes that the user, for example, an SAP customer collecting data, has consent from its data subject (a natural person such as a customer, contact, or account) to collect or transfer data to the solution.

SAP Customer Activity Repository is a back-office solution that provides data transfer and audit capabilities as well a platform for further analytics on activities, such as sales reporting and inventory counts. As such, SAP Customer Activity Repository does not directly require or support user-based consent management.

SAP Customer Activity Repository has no requirements involving personal data, although personal data may be provided to SAP Customer Activity Repository by retailers based on their own requirements. It is assumed that data provided to SAP Customer Activity Repository has been obtained with any necessary user consent already provided. If consent for use of specific data has not been obtained, then the applicable data provided (for example, within the data provided within any POS Data Transfer and Audit inbound APIs) should be limited by the retailer to only that which is permitted for their use.

It is expected that consumers of SAP Customer Activity Repository data, whether through POS Data Transfer and Audit outbound APIs or SAP HANA content, will ensure that any follow-on activities triggered from this data will consider the consent required for these follow-on activities.

2.9.4 Read Access Logging

Read access to personal data is partially based on legislation, and it is subject to logging functionality. Read access logging (RAL) is used to monitor and log read access to sensitive data. Data may be categorized as sensitive by law, by external company policy, or by internal company policy. Read access logging enables you to answer questions about who accessed particular data within a specified time frame. Here are some examples of such questions:

- Who accessed the data of a given business entity, for example a bank account?
- Who accessed personal data, for example of a business partner?
- Which employee accessed personal information, for example religion?
- Which accounts or business partners were accessed by which users?

From a technical point of view, this means that all remote APIs and UI infrastructures (that access the data) must be enabled for logging.

In read access logging (RAL), you can configure which read-access information to log and under which conditions. SAP delivers sample configurations for applications. The application component scenario logs data to describe business processes.

Fields defined as "Personal" are tracked in the read access log anytime their values are viewed by a user. For information on how read access logging is handled in SAP Customer Activity Repository, see [Enabling Data Protection and Privacy-Related Functionality \[page 83\]](#).

Read access logging is currently available in, but not limited to the following channels:

- Remote Function Calls (sRFC, aRFC, tRFC, qRFC, bgRFC)
- Dynpro (dynpro fields, ALV Grid, ABAP List, F4)
- Web Dynpro
- Web services
- Gateway (for OData)

More Information

SAP Library for SAP NetWeaver on SAP Help Portal at https://help.sap.com/viewer/p/SAP_NETWEAVER
▶ <your SAP NetWeaver Platform version> ▶ SAP NetWeaver Security Guide ▶ Data Protection and Privacy ▶
[Read Access Logging](#) ▶

2.9.5 Information Retrieval

Data subjects have the right to receive information regarding their personal data that is being processed. The information retrieval feature supports you in complying with the relevant legal requirements for data protection by allowing you to search for and retrieve all personal data for a specified data subject. The search results are displayed in a comprehensive and structured list containing all personal data of the data subject specified, organized according to the purpose for which the data was collected and processed.

POS Transactions With Subject-Specific Personal Data

You can use the **POS Transactions With Subject-Specific Personal Data** report (transaction [/n/POSDW/DISP_DPD](#)) to see all POS transactions containing personal data for a specific subject, such as a customer. You can configure the report to search for transactions containing their personal data based on contact information they provided. You can also extend the report to search for their personal data in other custom fields. You can then use this data for further action, such as archiving or blocking the data about the customer.

Audit Report for Transaction Logs

You can use the Audit Report for Transaction Logs ([/POSDW/DISM](#)) to see when any personal or sensitive data about a subject was accessed and modified, and by whom.

For more information, see the report documentation for the transaction in the ABAP system.

Demand Data Foundation (DDF)

The information stored for a business partner ID representing a customer or vendor is available for display. From your application server, use transaction code **NWBC** and navigate to **► Services ► Location Services ► Location ►**. Search for the vendor or customer ID desired to display the stored information.

2.9.6 Deletion of Personal Data

Simplified Blocking and Deletion

When considering compliance with data protection regulations, it is also necessary to consider compliance with industry-specific legislation in different countries. A typical potential scenario in certain countries is that personal data shall be deleted after the specified, explicit, and legitimate purpose for the processing of personal data has ended, but only as long as no other retention periods are defined in legislation, for example, retention periods for financial documents. Legal requirements in certain scenarios or countries also often require blocking of data in cases where the specified, explicit, and legitimate purposes for the processing of this data have ended, however, the data still has to be retained in the database due to other legally mandated retention periods. In some scenarios, personal data also includes referenced data. Therefore, the challenge for deletion and blocking is first to handle referenced data and finally other data, such as business partner data.

Deletion of Personal Data

The processing of personal data is subject to applicable laws related to the deletion of this data when the specified, explicit, and legitimate purpose for processing this personal data has expired. If there is no longer a legitimate purpose that requires the retention and use of personal data, it must be deleted. When deleting data in a data set, all referenced objects related to that data set must be deleted as well. Industry-specific legislation in different countries also needs to be taken into consideration in addition to general data protection laws. After the expiration of the longest retention period, the data must be deleted.

This SAP product might process data (personal data) that is subject to the data protection laws applicable in specific countries as described in SAP Note [1825544](#).

Deletion

To enable even complex scenarios, SAP simplifies existing deletion functionalities to cover data objects that are personal data by default. For this purpose, SAP uses SAP Information Lifecycle Management (ILM) to help you set up a compliant information lifecycle management process in an efficient and flexible manner. The functions that support the simplified blocking and deletion of personal data are not delivered in one large implementation, but in several waves. Scenarios or products that are not specified in SAP Note [1825608](#) (central Business Partner) and SAP Note [2007926](#) (ERP Customer and Vendor) are not yet subject to simplified blocking and deletion. Nevertheless, it is also possible to destroy personal data for these scenarios or products. In these cases, you have to use an existing archival or deletion functionality or implement individual

retention management of relevant business data throughout its entire lifecycle. The ILM component supports the entire software lifecycle including storage, retention, blocking, and deletion of data.

ILM-Enabled Archiving Objects

An ILM-enabled archive object can support the timely deletion of personal data by considering all relevant retention policies defined for the given object.

SAP Customer Activity Repository delivers the following objects for such use:

Archive Object	ILM Object
/POSDW/AGG	POSDW_AGG
/POSDW/TLF	POSDW_TLF

It is assumed that the lifecycle management of all replicated data will take place in the source system as SAP Customer Activity Repository is not considered the owner of such types of data. Properly configured SLT replication ensures that any data that has been deleted or archived in its source system is removed from all replica databases automatically. Retailers who choose to employ a different type of configuration than the expected approach will be required to make additional efforts to ensure that personal data is deleted in accordance with data protection policies for personal data.

Data in Cold Storage

Retailers who use the data aging capabilities available in SAP Customer Activity Repository to move data from memory to cold storage must ensure that any personal information contained in that data is deleted before reaching the cold storage repository. A manual process is required to delete the personal data to support data privacy compliance.

The following SQL statements are provided as an example of code that can be used to delete personal data in the cold storage repository.

⚠ Caution

It is important to run the following SQL statements in the exact order shown below. Deletions from the VT_TLOGF_NLS table must be performed **last**.

📄 Sample Code

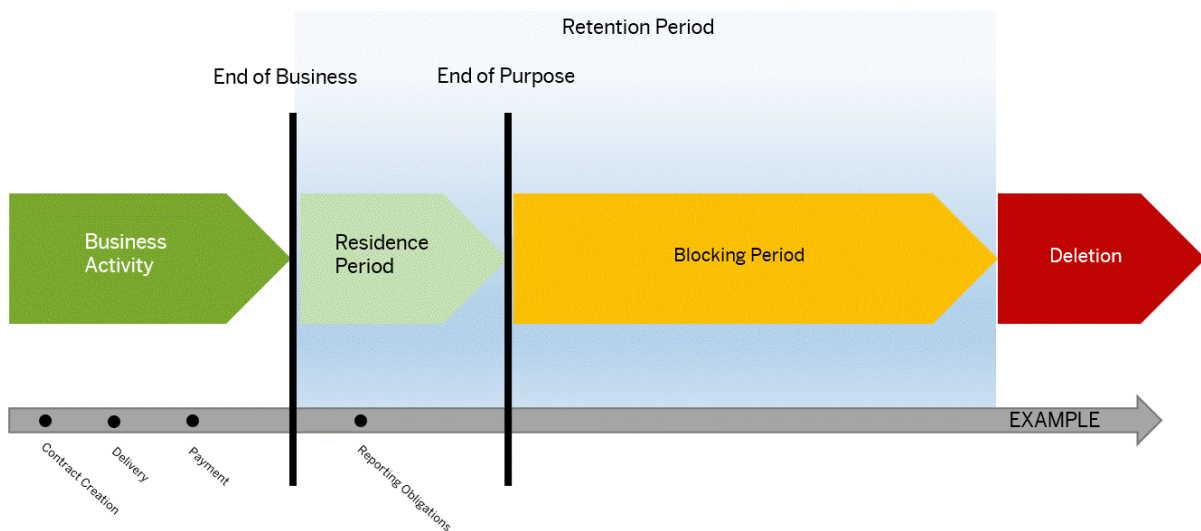
```
DELETE FROM "<SCHEMA>".VT_TLOGF_X_NLS
WHERE (MANDT, RETAILSTOREID, BUSINESSDAYDATE, TRANSINDEX)
IN ( SELECT DISTINCT MANDT, RETAILSTOREID, BUSINESSDAYDATE, TRANSINDEX
FROM "<SCHEMA>".VT_TLOGF_NLS
WHERE CUSTOMERNUMBER = '<CUSTOMERNUMBER>' );
DELETE FROM "<SCHEMA>".VT_TLOGF_EXT_NLS
WHERE (MANDT, RETAILSTOREID, BUSINESSDAYDATE, TRANSINDEX)
IN ( SELECT DISTINCT MANDT, RETAILSTOREID, BUSINESSDAYDATE, TRANSINDEX
FROM "<SCHEMA>".VT_TLOGF_NLS
WHERE CUSTOMERNUMBER = '<CUSTOMERNUMBER>' );
DELETE FROM "<SCHEMA>".VT_TLOGF_NLS
WHERE CUSTOMERNUMBER = '<CUSTOMERNUMBER>';
```

For more information about SAP ILM, see SAP Library for SAP ERP on SAP Help Portal at https://help.sap.com/viewer/p/SAP_ERP | <Version> > Application Help > SAP ERP Cross-Application Functions > Cross-Application Components > SAP Information Lifecycle Management >

End-of-Purpose Check

An end of purpose (EoP) check determines whether data is still relevant for business activities based on the retention period defined for the data. The retention period is part of the overall lifecycle of personal data, which consists of the following phases:

- **Business activity:** The relevant data is used in ongoing business, for example contract creation, delivery or payment.
- **Residence period:** The relevant data remains in the database and can be used in case of subsequent processes related to the original purpose, for example reporting obligations.
- **Blocking period:** The relevant data needs to be retained for legal reasons. During the blocking period, business users of SAP applications are prevented from displaying and using this data. It can only be processed in case of mandatory legal provisions.
- **Deletion:** The data is deleted and no longer exists in the database.



Blocking

Blocking of data can impact system behavior in the following ways:

- **Display:** The system does not display blocked data.
- **Change:** It is not possible to change a business object that contains blocked data.
- **Create:** It is not possible to create a business object that contains blocked data.
- **Copy/follow-up:** It is not possible to copy a business object or perform follow-up activities for a business object that contains blocked data.
- **Search:** It is not possible to search for blocked data or to search for a business object using blocked data in the search criteria.

It is possible to display blocked data if a user has special authorization; however, it is still not possible to create, change, copy, or perform follow-up activities on blocked data.

1. Before blocking or deleting of personal data, you must define the residence time and retention periods in SAP Information Lifecycle Management (ILM) for the corresponding ILM objects.
2. You can choose whether data deletion is required for data stored in archive files or data stored in the database, depending on the type of deletion functionality available.
3. For an end of purpose check regarding business partner master data complete the following steps:
 - Define the required residence and retention policies for the business partner ILM objects.

- Run the corresponding transaction to enable the end-of-purpose check function for business partners. After EoP the master data is blocked and the required retention information is stored.
 - Business users can request unblocking of blocked business partner master data. Users that have the necessary authorizations can unblock the data.
4. You can delete data using the transaction ILM_DESTRUCTION for the ILM objects of application, component, scenario.

Expected Behavior Within SAP Customer Activity Repository

The scenarios used within SAP Customer Activity Repository do not enforce any mandatory data integrity constraints relating to personal data or references to personal data through master data objects. For example, within POS Transfer and Audit, there may exist a business partner number that has been provided within a TLOG transaction, but there is no validation on the validity of such a reference nor any possibility of obtaining more information relating to this referenced business partner. Retailers have the ability to not provide such types of data in cases where the data is considered as blocked from use. As such, POS Data Transfer and Audit is considered as relevant for EoP checking.

Due to the fact that Point-Of-Sale transactions cannot be prevented from being created as a reaction to any data references to external systems' master data objects, such as Business Partner, Customer, or Vendor, it is not possible to enforce the proposed typical system behaviors when there is a blocked reference (preventing the display/change/creation/copy of data referencing a blocked reference). Regardless, the transaction logs must be processed with the original data provided from the Point-Of-Sale system, and transferred to other retail applications.

Within Point-Of-Sale Data Transfer and Audit, customer determination carried out through SAP CRM Loyalty Card or SAP yMKT Contact Facet only considers data that is not blocked from use.

Within SAP HANA content for SAP Customer Activity Repository, views exposing personal data are expected to follow a similar approach to minimize the use of blocked data. For example, views exposing transactional data involving the SAP CRM Business Partner object through its corresponding SAP ECC or S/4HANA Customer object will restrict results to only those where the SAP CRM Business Partner is not considered as blocked from use. This is accomplished through SAP HANA content modeling techniques. It should be noted that if auditing of replicated data that is considered blocked from use is required (where a special authorization is needed), that it would be at the retailers' discretion to implement such an approach, as it is assumed that the originating system would be the only system that would deliver this type of support, if required. Existing views exposing master data objects exposing personal information now restrict the results to only those entries which are not considered as blocked from use. New versions of such views are available for cases where unrestricted results are needed along with the necessary blocking status information, so that appropriate data handling can be supported.

Views Affected by Blocking

The following table provides a list of views affected by blocking. In general views having data that could be relevant for blocking will have implemented blocking. This is the case for the views listed below. Any view named as **Unrestricted* or **_UNRESTRICTED* implies that blocking would be relevant but it is not being done. Blocking-relevant information is provided by the view.

You can consult the following views as examples of how to incorporate blocking into your use of TLOG data. Further details are provided in the view's entry in the table below.

- `sap.is.retail.car/POSSalesQuery`
- `sap.is.retail.car.crm/MULTICHANNEL_BUSINESS_PARTNER_SALE_ITEM`
- `sap.is.retail.car.cuan/POSSales_Hybris_Marketing`

View Affected by Blocking

View Name	Data Relevance		Example of Master Data Objects Involved	
	MD = Master Data	Affected by Blocking (Added)	Affected by Blocking (Indirectly)	Customer -Based Vendor-Based
SAP HANA Live views				
Packages:				
<ul style="list-style-type: none"> • <code>sap.is.retail.ecc</code> • <code>sap.is.retail.s4h</code> 				
AddressTimeZone	MD	X (Direct)		
BillingDocument-Condition	TD	X	SoldToParty, PayerParty	
BillingDocument-Header	TD	X	SoldToParty, PayerParty	
BillingDocumentItem	TD	X	SoldToParty, PayerParty	
CustomerBasic-Data	MD	X (Direct)	Customer	
MaterialProcurementArrangement	MD	X		Vendor
SalesDocument-Header	TD	X	SoldToParty	
SalesDocumentItem	TD	X	SoldToParty	
SalesDocument-ScheduleLine	TD	X	SoldToParty	
Vendor	MD	X (Direct)	Customer	Vendor

View Name	Data Relevance			Example of Master Data Objects Involved	
	MD = Master Data	Affected by Blocking (Added)	Affected by Blocking (Indirectly)	Customer -Based	Vendor-Based
BillingDocumentHeader	TD		X	SoldToParty	
BillingDocumentItem	TD	X		SoldToParty	
BillingDocumentItemArticleHierarchyQuery	TD	X			
BillingDocumentItemQuery	TD	X		SoldToParty, SoldToPartyName	
MultiChannelSalesItemOCDDetermination	TD		X	SoldToParty	
MultiChannelSales	TD		X	CustomerNumber	
MultiChannelSales_V2	TD		X	CustomerNumber	
MultiChannelSalesQuery	TD	X		Customer, CustomerName	

View Name	Data Relevance			Example of Master Data Objects Involved	
	MD = Master Data	Affected by Blocking (Added)	Affected by Blocking (Indirectly)	Customer -Based	Vendor-Based
POSSalesQuery Where blocking is done based on SAP ECC Customer referenced within TLOG item CustomerNumber (as an SAP ECC Customer that has been mapped to a SAP CRM BP), and uses an SQL left outer join to a view that does expose blocked SAP ECC Customers so that results can be explicitly filtered at the last step in the internal view execution.	TD	X		Customer, CustomerName	
SalesOrderItem	TD	X		SoldToParty	
CAR NLS views					
Packages:					
<ul style="list-style-type: none"> • <code>sap.is.retail.car.nls</code> • <code>sap.is.retail.car_s4h.nls</code> 					
MultiChannelSalesPruning_NLS	TD		X	CustomerNumber	
SAP Customer Activity Repository Smart Business Fiori views					
Package: <code>sap.hba.t.rtl.car.mcsa.v</code>					
BillingDocumentItem	TD	X			

View Name	Data Relevance			Example of Master Data Objects Involved	
	MD = Master Data	Affected by Blocking (Added)	Affected by Blocking (Indirectly)	Customer -Based	Vendor-Based
ArticleNetSales			X		
ArticleNetSales-Query					
AverageTransactionValueItemOverview			X		
AverageTransactionValueBase					
AverageTransactionValueByCategory					
AverageTransactionValueByCity					
AverageTransactionValueByCountry					
AverageTransactionValueByOC					
AverageTransactionValueByRegion					
AverageTransactionValueByStore					
AverageTransactionValueCurPerd-Query					
AverageTransactionValueHdr					

View Name	Data Relevance		Example of Master Data Objects Involved	
	MD = Master Data	Affected by Blocking (Added)	Affected by Blocking (Indirectly)	Customer -Based Vendor-Based
GrossMargin			X	
GrossMarginBase				
GrossMarginCurPerdQuery				
GrossMarginHdrQuery				
GrossMarginTopBottomByCountry				
GrossMarginTopBottomByRegion				
GrossMarginQuery				
GrossMarginTopBottomByCategory				
GrossMarginTopBottomByCity				

View Name	Data Relevance		Example of Master Data Objects Involved	
	MD = Master Data	Affected by Blocking (Added)	Affected by Blocking (Indirectly)	Customer -Based Vendor-Based
NetSalesTopBottomByStore			X	
NetSales				
NetSalesBase				
NetSalesCurPeriodQuery				
NetSalesHdrQuery				
NetSalesQuery				
NetSalesTopBottomByCategory				
NetSalesTopBottomByCity				
NetSalesTopBottomByCountry				
NetSalesTopBottomByRegion				
NetSalesTopBottomByStore				
NumberOfSalesItemsPerTransactionBase			X	
NumberOfTransactionsBase				
NumberOfTransactionsItemOverview				
GetMultiChannelSalesConverted			X	
Integration views				
Package: sap.hba.t.rtl.car.int.v				

View Name	Data Relevance			Example of Master Data Objects Involved	
	MD = Master Data	Affected by Blocking (Added)	Affected by Blocking (Indirectly)	Customer -Based	Vendor-Based
MultiChannelSalesOrdersQuery	TD	X		CustomerNumber	
MultiChannelSalesQuery	TD		X		
CAR CRM views					
Packages:					
<ul style="list-style-type: none"> • sap.is.retail.car.crm • sap.is.retail.car_s4h.crm 					
CRMBpSlsItem	TD		X	CUSTOMER_NUMBER	
CRMBusinessPartnerAddress	MD	X		BusinessPartnerid CustomerNumber	
CRMPosItmLoy	TD	X		CUSTOMER_NUMBER SOLD_TO_PARTY	
CRMPosItmSls	TD	X		CUSTOMER_NUMBER SOLD_TO_PARTY	
CRMPosLoySls	TD	X		CUSTOMER_NUMBER SOLD_TO_PARTY	
CRM_BUSINESS_PARTNER_INFO	MD		X	BUSINESS_PARTNER_ID CUSTOMER_NUMBER	

View Name	Data Relevance			Example of Master Data Objects Involved	
	MD = Master Data	Affected by Blocking (Added)	Affected by Blocking (Indirectly)	Customer -Based	Vendor-Based
MULTICHANNEL_BUSINESS_PARTNER_SALE_ITEM	TD		X	BUSINESS_PARTNER_ID	

MULTICHANNEL_BUSINESS_PARTNER_SALE_ITEM

Where blocking is done based on SAP CRM Business Partner referenced within TLOG item

CustomerNumber (as an SAP ECC Customer that has been mapped to a SAP CRM BP) and SAP ECC sales order item SoldToParty, and uses an SQL inner join to a view that does not expose blocked SAP CRM Business Partners.

POSDM views related to CRM data

Package: `sap.is.retail.posdm.crm`

CRMBusinessPartner	MD	X	BusinessPartnerId	CustomerNumber
--------------------	----	---	-------------------	----------------

CAR Hybris Marketing views

Packages:

- `sap.is.retail.car.cuan`
- `sap.is.retail.car_s4h.cuan`

View Name	Data Relevance			Example of Master Data Objects Involved	
	MD = Master Data	Affected by Blocking (Added)	Affected by Blocking (Indirectly)	Customer -Based	Vendor-Based
BillingDocument_Hybris_Marketing	TD	X		SAPHybrisMarketingContactKey	
MultiChannelSalesByTargetGroupPromotionQuery	TD		X	CustomerNumber	
MultiChannelSalesWithTargetGroup	TD	X		CustomerNumber	
MultiChannelSales_Hybris_Marketing	TD		X	SAPHybrisMarketingContactKey	
POSSales_Hybris_Marketing	TD	X		SAPHybrisMarketingContactKey	

Where blocking is done based on SAP yMKT Contact Facet referenced within TLOG item CustomerNumber (as an SAP yMKT Contact Facet Key) , and uses an SQL left outer join to a view that does expose blocked/ obsolete SAP yMKT Contact Facets so that results can be explicitly filtered at the next step in the internal view execution.

View Name	Data Relevance			Example of Master Data Objects Involved	
	MD = Master Data	Affected by Blocking (Added)	Affected by Blocking (Indirectly)	Customer -Based	Vendor-Based
Assumes private views are omitted	TD = Transaction Data				
SegmentationTargetGroup	MD	X		ERPCustomer-Number	
POSDM views related to SAP Marketing data					
Package: sap.is.retail.posdm.cuan					
INTERACTION_CONTACT_FACET	MD	X		CONTACT_KEY FACET_ID_KEY IC_FACET_ID	

It is assumed that in scenarios where no personal data is present in the exposed results of a view, it is acceptable that no further data restrictions would be needed in order to support retailers' reporting needs such as for period-over-period sales comparisons and so forth.

Retailers must take care to ensure that any custom SAP HANA content created based on SAP HANA content for SAP Customer Activity Repository adheres to similar approaches to comply with any legal requirements relating to personal data.

Expected Behavior Within Demand Data Foundation (DDF)

DDF imports the Customer and Vendor Business Partner (BP) objects to allow consuming applications to plan. The scenario for DPP is when an SAP ERP application sends data to an application in SAP Customer Activity Repository applications bundle and has requested a Business Partner ID (vendor or customer) to be masked. This is not applicable for 3rd-party source systems. When the Data Replication Framework (DRF, transaction **DRFOUT**) is executed for location type customer or vendor (outbound implementation `PCUST` or `PVEN`) data, it can contain a `<Block Status Flag>` on. The location import process looks for this status and masks the appropriate Customer and Vendor Business Partner ID and name in the DDF tables.

In order to use this DPP functionality there are prerequisite Customizing activities. In addition, a `BADI` has been introduced so the consuming applications can add specifics for their application to be executed after the import. These activities are in the [SAP Customizing Implementation Guide](#) and are accessed using transaction code **SPRO**. Navigate to structure node [Customer Activity Repository > Demand Data Foundation > Data Maintenance > Data Protection and Privacy](#) to view the activities and associated documentation.

Another case for deletion of personal data is when a user has requested to be forgotten. Users that are created in the system are also created as Business Partner IDs. The resulting User ID in the consuming application screens and data sources are usually saved in a `Created By` or `Changed By` field. This requirement is fulfilled on

the DDF data by using a transaction code that will run this request. Transaction code [/DMF/PURGE_USER_ID](#) executes report [/DMF/PURGE_CREATEDBY_CHANGEDBY](#).

An authorization object is required to run the report. To update your authorization, use transaction code [SE80](#) and in the selection dropdown, choose [Development Object](#) and object [/DMF/PURGE](#). Double click the object name in the list. On the [Display Authorization Object](#) screen, you update the object by selecting the [Permitted Activities](#) button, select [Activity 51](#) and save.

1. To process the mask User ID request, execute transaction code [/DMF/PURGE_USER_ID](#). Enter the **User ID** to be masked. The following fields are masked for the *User ID* value.
 - [/DMF/CHANGED_BY](#)
 - [/DMF/CREATED_BY](#)
 - [/PRM/CREATED_BY](#)
 - [/PRM/CHANGED_BY](#)
 - [/RAP/CREATED_BY](#)
 - [/RAP/CHANGED_BY](#)
 - [/OAA/CREATED_BY](#)
 - [/OAA/CHANGED_BY](#)
2. You should verify any entry containing the *User ID* value is removed from log files or an exception monitor by performing steps a. and b.
 1. Purge exceptions from the exception monitor. Use transaction code [NWBC](#) to access [Services](#) [Mass Maintenance Services](#) [Purging Exceptions from the Database](#).
 2. Search the standard application logs using transaction code [SLG1](#) to search for existence of the User ID, and [SLG2](#) to delete the records.

Where-Used Check

i Note

SAP Customer Activity Repository does not deliver a WUC at this time.

2.9.7 Change Log

Creation and change of personal data need to be documented. Therefore, for review purposes or as a result of legal regulations, it may be necessary to track the changes made to this data. When these changes are logged, you should be able to check which employee made which change, the date and time, the previous value, and the current value, depending on the configuration. It is also possible to analyze errors in this way.

Displaying Change Logs in SAP Customer Activity Repository

You can access the change log of each change request or activity in the *worklist* for SAP Customer Activity Repository.

i Note

Change logs can only be displayed if the user is assigned the authorization role [SAP_AUTH_MOC_ADMIN](#).

Under ► *Evaluate New Audit Trail* ► *Enhancement Mode* (transaction **S_AUT10**), you can see all changes that have been processed for the change document objects in <SAP product>, S_/IAM/ACT (activity) and /IAM/ISSUE (change request).

More Information

For more information on change documents, see the documentation at https://help.sap.com/viewer/p/SAP_NETWEAVER. Choose the relevant SAP NetWeaver version and open the following documentation:

- Under *Application Help*, navigate to ► *SAP NetWeaver Library: Function-Oriented View* ► *Application Server ABAP* ► *Other Services* ► *Services for Application Developers* ► *Change Documents*.
- Open the *SAP NetWeaver Security Guide* and navigate to ► *Security Aspects for Lifecycle Management* ► *Auditing and Logging*.

2.9.8 Enabling Data Protection and Privacy-Related Functionality

Use

SAP Customer Activity Repository supports data protection by providing updated functions that allow you to mask select fields and track when anyone accesses them.

Prerequisites

To enable or use the data protection features in SAP Customer Activity Repository, the /POSDW/DPP_SECURITY role is required in all cases. Additionally, there are other authorization requirements a user will need to perform functions such as running reports or making changes to data protection-related Customizing settings. The following table shows the various functions that SAP Customer Activity Repository provides to support data protection and the specific authorization elements required to use them.

⚠ Caution

The /POSDW/DPP_SECURITY role is vital to the functions related to data protection and privacy. Failure to assign this role to a user may result in unintended data being available to them.

Authorization Requirements to Enable and Use Data Protection and Privacy Functions

DPP-Related Entity	Description	Transaction or Command to Generate	DPP Relevance	Authorization Requirements
Customizing Activities	<ul style="list-style-type: none"> • Field Selection Profile • Maintain TLOG Customer Enhancement Field Mapping 	SPRO	Customizing activities that allow you to control actions on selected fields, or how their output should be handled. For example, you can mask field values that would normally appear unmasked in the <i>Audit Report for Transaction Logs</i> , the read access log, or in the POS Workbench.	<p>Role = /POS DW/ DPP_SECURITY</p> <p>The following authorization objects are required to work with this Customizing activity:</p> <ul style="list-style-type: none"> • W_POS_FSPR is required to associate a user with a specific field profile. The value of the profile number is specified in field /POS DW/FSP • W_POS_DPPV is required to perform the task of selecting fields for masking in POS Workbench and in the <i>Audit Report for Transaction Logs</i>. Activity = 23 [Maintain Field Selection Profile]
Report	POS Transactions with Subject-Specific Personal Data Report	/n/POS DW/DISP_DPD	Allows you to search the transaction log for personal information on a specific subject using their name, customer number, or other contact information as search criteria	<p>Role = /POS DW/ DPP_SECURITY</p> <p>Authorization object = W_POS_DPPV</p> <p>Activity = 04 [Display]</p>

DPP-Related Entity	Description	Transaction or Command to Generate	DPP Relevance	Authorization Requirements
Application Log	<p>Audit Report for Transaction Logs</p> <div style="background-color: #f0f0f0; padding: 5px; border: 1px solid #ccc;"> <p>i Note</p> <p>This report may also be referred to as the Modifications Report.</p> </div>	/n/POSDW/DISM	Updated to provide a filter that will only search for transactions with changes to personal data and to mask data for select fields according to their assigned field selection profile.	Role = /POSDW/ DPP_SECURITY Authorization object = W_POS_DPPV Activity = 03 [Display Masked Value]
Application Log	<p>Analyze Application Log</p> <p>Read Access Log</p>	SLG1 Object: /POSDW/DPP <ul style="list-style-type: none"> • Sub-object: RAL To see who viewed masked fields in the POS Workbench or in the Audit Report for Transaction Logs (modifications report) • Sub-object = DISPLAY_PERSON DATA To see who had previously run the POS Transactions with Subject-Specific Personal Data Report 	Logs the following activities: <ul style="list-style-type: none"> • When selected masked fields have been viewed by a user • When unencrypted fields related to payments cards have been viewed • When anyone runs the POS Transactions with Subject-Specific Personal Data Report 	Role = /POSDW/ DPP_SECURITY Authorization object = S_APPL_LOG Activity = 03 [Display] Object = /POSDW/DPP Sub-object = * (Administrator)
Application Log	<p>Evaluate Log Records Using Payment Card Access</p> <p>Read Access Log for Payment Cards</p>	CCSEC_LOG_SHOW	Logs when encrypted payment card fields have been accessed and viewed by a user.	Authorization object = B_CCSEC Activity = 71 [Analyse]

DPP-Related Entity	Description	Transaction or Command to Generate	DPP Relevance	Authorization Requirements
SAP HANA views	<p>SAP HANA views in <code>sap.is.retail.car</code> and <code>sap.is.retail.car_s4h</code> packages:</p> <ul style="list-style-type: none"> • <code>DPPRelevantFieldsQuery</code> • <code>ProcessLogFieldValueChangedQuery</code> 		<p><code>DPPRelevantFieldsQuery</code>:</p> <p>This view provides the names of the fields which are flagged as personal in a user's assigned field selection profile.</p> <p><code>ProcessLogFieldValueChangedQuery</code>:</p> <p>This view allows users to see field value changes made in POS Workbench and masks the values of the <code>FieldValueOld</code> and <code>FieldValueNew</code> fields for fields that are flagged as personal based on data provided by the <code>DPPRelevantFieldsQuery</code> view.</p>	<p>You must ensure that users who will work with these views have the required field selection profile assigned to them and that required SAP HANA analytic privileges are created for them to access the SAP HANA views.</p> <p>Before creating the analytic privileges you must create metadata for the SAP HANA views as SAP no longer delivers the metadata for the views (due to technical limitations). Information on how to do this is provided in SAP Note 2551735.</p>

Customizing Settings for Encryption and Masking

The following section describes activities you may need to complete to enable your system to take advantage of enhanced masking features, depending on the fields you need to mask. SAP Customer Activity Repository provides Customizing settings that allow you to set masking for payment card types, such as debit cards and loyalty cards, and for additional fields that may be associated with them, such as the customer name or contact information. It also provides flexibility that allows you to set different masking logic for each payment instrument associated with the same payment card type.

You can make settings in three different Customizing activities to enable encryption or masking of personal or sensitive data in SAP Customer Activity Repository. You may need to make settings in all activities or only in some of them depending on your data and your masking requirements.

Relevant for Fields Related to Payment Cards

- Encryption/masking Customizing settings provided by SAP NetWeaver

SAP NetWeaver already provides your system with encryption and masking capabilities for payment card number fields that you can set through the *Make Security Settings for Payment Cards* Customizing activity under **► Cross-Application Components ► Payment Cards ► Basic Settings ► Make Security Settings for Payment Cards ►**. You can use these settings to turn on global payment card encryption and define masking for payment cards. When you use this setting, you set the encryption and masking rule for all payment instruments associated to this payment card type.

- Tender type Customizing settings
 - To enable the encryption of debit cards or credit cards, you must first define tender types for them in the **► POS Data Management ► POS Inbound Processing ► POS Transaction ► Define Tender Type ►** Customizing activity.
 - To enable the encryption of loyalty cards, you must define the loyalty card type in the *Loyalty Card type for Mask/Encryption* field in the **► POS Data Management ► POS Inbound Processing ► General Settings ►** Customizing activity.
- In the *Field Selection Profile* Customizing activity under **► POS Data Management ► POS Inbound Processing ►**, mark the required fields in their corresponding segments as personal, as required:
 - **Card number** of the credit card segment
 - **Account number** of the debit card segment
 - **Customer card number** of the loyalty card segment

The following table illustrates the system response when you make the settings in various combinations.

SAP NetWeaver Setting			
'Make Security Settings for Payment Cards'	POSDT&A Setting 'Define Tender Type'	POSDT&A Setting 'Field Selection Profile'	Result
X	X	X	Precedence given to the POSDT&A <i>Define Tender Type</i> setting This setting overwrites any settings created in the SAP NetWeaver <i>Make Security Settings for Payment Cards</i> setting.
X	Not set	X	Precedence given to the SAP NetWeaver setting <i>Make Security Settings for Payment Cards</i>
Not set	X	X	Precedence given to the POSDT&A <i>Define Tender Type</i> setting

SAP NetWeaver Setting 'Make Security Settings for Payment Cards'	POSDT&A Setting 'Define Tender Type'	POSDT&A Setting 'Field Se- lection Profile'	Result
X	X	Not set	Precedence given to the POSDT&A <i>Define Tender Type</i> setting. This setting overwrites any settings created in the SAP NetWeaver <i>Make Security Settings for Payment Cards</i> setting.

Relevant for Other Fields

Settings for masking of non-payment cards fields

The Customizing for *Field Selection Profile* provides functions that allow you to mask non-payment fields that may contain personal or sensitive data.

Setting in Field Selection Profile Customizing	Result of Setting
<p><i>Mask in Log</i></p> <p>Relevant for the process log and the Audit Report for Transaction Logs</p>	<p>This setting masks the old and new values of a changed field in the <i>Audit Report for Transaction Logs</i> and in the PLOGF DB table.</p> <p>When you use this setting, you have the option of leaving some characters at the beginning and/or at the end of the field value unmasked. You can define this in the <i>At Start</i> and <i>At End</i> fields. The entire field is masked if you do not specify anything in these fields.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>i Note</p> <p>When this indicator is set, the system automatically sets the <i>Personal Data Flag</i> indicator as well.</p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>⚠ Caution</p> <p>Once values are masked the original values of the fields can never be restored in the <i>Audit Report for Transaction Logs</i>, even if you deselect the <i>Mask in Log</i> option because the data is saved as masked in the PLOGF DB table.</p> </div>

Setting in Field Selection Profile Customizing	Result of Setting
<p><i>Personal Data Flag</i></p> <p>Relevant for the POS Workbench and for Read Access Logging (RAL)</p>	<p>This setting tells the system to log every instance when a defined field is viewed in POS Workbench to the read access log. This consists of writing an entry in the system application log <code>SLG1</code> with object name <code>/POSDW/DPP</code> and subobject name <code>RAL</code>.</p> <p>When you use this setting, you have the option of leaving some characters at the beginning and/or at the end of the field value unmasked. You can define this in the <i>At Start</i> and <i>At End</i> fields.</p>
<p><i>Mask Display</i></p> <p>Relevant for the POS Workbench</p> <p>Used in conjunction with the <i>Personal Data Flag</i> setting</p>	<p>This setting tells the system to mask the displayed value of a defined field in the following instances:</p> <ul style="list-style-type: none"> • POS Workbench • Audit Report for Transaction Logs <p>When you use this setting, you have the option of leaving some characters at the beginning and/or at the end <i>At Start</i> and <i>At End</i> fields.</p>
<p><i>Mask in RAL</i></p> <p>Relevant for Read Access Logging</p>	<p>Masks the value of a field that is logged in the read access log (application log). When you use this setting, you have the option of leaving some characters at the beginning and/or at the end of the field value unmasked. You can define this in the <i>At Start</i> and <i>At End</i> fields.</p>
<p><i>At Start</i></p>	<p>Defines how many characters to leave unmasked at the beginning of a field value</p>
<p><i>At End</i></p>	<p>Defines how many characters to leave unmasked at the end of a field value.</p>

Example of Settings in Field Selection Profile

The following table provides an illustration of the results you can expect to see for the *Cardholder Name* field with a value of **SMITHSON** when you use various combinations of the *Field Selection Profile* settings.

Mask in Log	Personal Data Flag	Mask Display	Mask in RAL			Impact to / Masking Result	Field Value Masking Result
PLOG	Read Access Log	Workbench	Application log SLG1	At Start	At End		
	X	X		2	3	Impact to: <ul style="list-style-type: none"> • POS Workbench • Audit Report for Transaction Logs Entry created in application log (RAL process) as soon as someone views the personal field	SM***SON <div style="border: 1px solid orange; padding: 5px; margin-top: 10px;"> <p>⚠ Caution</p> <p>This will completely expose the field value in the process log.</p> </div>
X	X*			2	2	In Workbench: Entry created in application log (RAL process) as soon as someone views the personal field	SMITHSON (No masking)

Mask in Log	Personal	Mask Display	Mask in RAL	At Start	At End	Impact to / Masking Re- sult	Field Value Masking Re- sult
	Data Flag						
PLOG	Read Access Log	Workbench	Application log SLG1				
						In Audit Re- port for Transaction Logs: This scenario is not relevant for RAL since the values of the personal fields are masked per- manently in the process log and they cannot be un- masked in the Audit Report for Transac- tion Logs.	SM****ON
X	X	X		2	2	In Audit Re- port for Transaction Logs: This scenario is not relevant for RAL since the values of the personal fields are masked per- manently in the process log and they cannot be un- masked in the Audit Report for Transac- tion Logs.	SM****ON

Mask in Log	Personal	Mask Display	Mask in RAL	At Start	At End	Impact to / Masking Re- sult	Field Value Masking Re- sult
	Data Flag						
PLOG	Read Access Log	Workbench	Application log SLG1				
	X	X	X	1	1	PLOGF	<div style="border: 1px solid orange; padding: 5px;"> <p>⚠ Caution</p> <p>This will completely expose the field value in the process log.</p> </div>
						POS Workbench	S*****N
						Audit Report for Transaction Logs	S*****N
						Read Access Log	S*****N
	X					For POS Workbench and Audit Report for Transaction Logs: Entry created in application log (RAL process) as soon as someone views the personal field	SMITHSON (No masking) <div style="border: 1px solid orange; padding: 5px;"> <p>⚠ Caution</p> <p>This will completely expose the field value in the process log.</p> </div>

Mask in Log	Personal	Mask Display	Mask in RAL	At Start	At End	Impact to / Masking Re- sult	Field Value Masking Re- sult
	Data Flag						
PLOG	Read Access Log	Workbench	Application log SLG1				
X	X					<p>In Workbench:</p> <p>Entry created in application log (RAL process) as soon as someone views the personal field</p> <hr/> <p>In Audit Report for Transaction Logs:</p> <p>This scenario is not relevant for RAL since the values of the personal fields are masked permanently in the process log and they cannot be unmasked in the Audit Report for Transaction Logs.</p>	*****

Other Encryption or Masking Requirements

Encryption of sensitive or personal data in the IDOC database

To set encryption of fields related to the **card number** in the credit card segment, the **account number** in the debit card segment, and the **customer card number** in the loyalty card segment ensure that the following BAdI implementations are activated:

/POSDW/PCA_IDOC, MAP	To encrypt data and insert it into the IDOC database
/POSDW/PCA_IDOC_CRYPT	To retrieve encrypted data from the IDOC database and decrypt it

Enable inbound processing to process encrypted bin data

These functions are used by a store's POS system to send data to SAP Customer Activity Repository. You will need to ensure that the processes that now encrypt loyalty card data are activated on your system. Run any of the following relevant functions according to the inbound process that you use.

BAPI function	/POSDW/BAPI_POSTR_CREATE
IDOC process	/POSDW/POSTR_CREATEMULTIPLE06
Web service	PointOfSaleTransactionERPBulkCreateRequest_In

2.10 Security for Additional Applications

The SAP Customer Activity Repository application does not have any additional third-party applications associated with it or delivered with it, nor does it have any mandatory dependencies on third-party applications.

For customer scenarios when third-party applications are optionally used, the relevant security settings for the applicable application should be considered in combination with those of the SAP Customer Activity Repository application.

2.11 Security for Omnichannel Article Availability and Sourcing

When using omnichannel article availability and sourcing (OAA), make sure that you are aware of the following security risks and that appropriate mitigations are in place, in the areas of ATP calculation, sourcing, and temporary reservations.

ATP Snapshot for DCs

If the omnichannel manager accidentally adds too many sources to the sourcing network, for example by including sources that were never set up for delivering articles ordered online, the number of article/source combinations to be processed in the parallelized ATP run increases. This results in the following:

- The system load rises, while the system performance decreases on the server group used for the parallelized ATP run.
- When the system load exceeds a certain level, generation of the ATP snapshot is no longer possible.
- Obsolete reservations cannot be cleared, and new ones keep building up.
- The follow-on processes cannot be started. For example, articles ordered online cannot be shipped although they are available.

i Note

Make sure that no irrelevant sources are included in the sourcing network and that the number of article/source combinations to be processed is still manageable.

When generation and replication of the ATP snapshot for DCs is triggered, SAP CAR calls an RFC function module in the back-end system (SAP S/4HANA or SAP Retail) to retrieve the availability data for the DCs. If the RFC connection to the back-end system is not set up in a secure way in SAP CAR, unauthorized callbacks to SAP CAR might become possible.

i Note

Make sure that the RFC connections in SAP CAR are set up in a secure way, by using a positive callback list for your RFC destination.

Called Function Module: back-end RFC `OAA_RFC_WRAP_ATP_CHECK`

Callback Function Module: SAP CAR RFC `/OAA/ATP_PRECALC_WRITE`

Availability Calculation

There is a risk that you as the owner of an online store inadvertently disclose a DC's or a vendor's identity and availability information, by exposing it in the online store. This information might be of high interest to your competitors. The situation is particularly critical if a vendor is a company run by a single person and if the vendor ID is that person's name.

i Note

Make sure that the setup of your online store does not allow manipulation, e.g. through CSRF. Never use people's names as vendor IDs.

Sourcing and Temporary Reservations

If there are too many temporary reservations for the same article, for example through creation by a bot, the article incorrectly shows up as not being available and cannot be sold any more.

i Note

Make sure that a web application firewall protects your online store from requests that show malicious patterns.

Do not implement sourcing for any of the ordering steps that precede the checkout. Restrict the implementation of sourcing to checkout only since when going to checkout, customers need to provide their credentials to sign in.

2.12 Security for Omnichannel Promotion Pricing Using SAP HANA XS Advanced

Output Format of Response

To send a request to the promotion pricing service (PPS), you must add a header with one of the following content types:

- `application/xml` to send a request in XML format
- `application/json` to send a request in JSON format

The PPS processes the request and carries out the output encoding related to the content type. The response contains a header for the content type according to the content type of the request. The output encoding makes sure that cross side scripting cannot occur on caller side.

For more information about the output format of the PPS response, see the documentation of the OPP Client API on SAP Help Portal under <https://help.sap.com/viewer/p/CARAB> ► <Version> ► Development ► Client API for Omnichannel Promotion Pricing ►.

Restriction of Access Rights of the Database User to OPP Database Tables and Views

To access the database tables and views that contain price and promotion information in SAP Customer Activity Repository, you need a specific database user for the promotion pricing service powered by SAP HANA XS Advanced (XSA).

SAP recommends to restrict the access rights of this database user to read access for the required tables.

You can restrict the access rights by creating a role in SAP HANA that contains only the required database tables and views, and by assigning this role to the database user. The database user needs read access for the following database tables and views:

Name	Description
/ROP/ELIGIBILITY	Price derivation rule eligibility
/ROP/EX_ACT_PARM	External action parameter for OPP promotion
/ROP/EX_ACT_TEXT	External action text for OPP promotion
/ROP/MAM_ITEM	Mix-and-match price derivation item
/ROP/PRICE_RULE	Price derivation rule
/ROP/PROMO_BU	Business units relevant for OPP promotion
/ROP/PROMO_RULE	Promotion price derivation rule
/ROP/PROMO_TEXT	Language-dependent texts of an OPP promotion
/ROP/PROMOTION	OPP promotion
/DMF/BASE_PRC_V	View to read regular prices
/ROP/MERCH_SET	Product group

For more information about how to create a restricted database user in SAP HANA, see the *SAP HANA Administration Guide* on SAP Help Portal under https://help.sap.com/viewer/product/SAP_HANA_PLATFORM/<Version> Administration SAP HANA Administration Guide Security Administration.

Transfer of Database User and Password

To read regular prices and OPP promotions from the database, the central promotion pricing service needs a database user. You have to specify this database user and the password during creation of the database service. When you have created the database service, clear the command history to prevent unauthorized disclosure of the password.

For more information about XSA-specific configuration of the promotion pricing service, see the *Common Installation Guide for CARAB* on SAP Help Portal under <https://help.sap.com/viewer/p/CARAB> **|** *<Version>* **>** *Installation and Upgrade* **>** *Common Installation Guide* **>** *Post-Installation* **>** *SAP Customer Activity Repository* **>** *Configure Omnichannel Promotion Pricing for Use with SAP Customer Activity Repository* **>** *Central Deployment of the Promotion Pricing Service* **>**.

Secure Setup and Configuration

With the configuration of the promotion pricing service, you can determine the maximum number of items in a request. Requests that exceed the maximum number of items are rejected.

SAP recommends to set this parameter to a suitable value.

For more information about the description of parameters, see the *Development and Extension Guide for OPP* on SAP Help Portal under <https://help.sap.com/viewer/p/CARAB> **|** *<Version>* **>** *Development* **>** *Development and Extension Guide for Omnichannel Promotion Pricing* **>** *sap.client-impl.maxnumberoflineitems* **>**.

If you want to add your own extension to the promotion pricing service, choose suitable access rights for both, the used directory and the jar file that contains your extension. The access should be restricted to the most possible extent (only to trusted users).

For more information about the extensibility of the promotion pricing service, see the *Development and Extension Guide for OPP* on SAP Help Portal under <https://help.sap.com/viewer/p/CARAB> **|** *<Version>* **>** *Development* **>** *Development and Extension Guide for Omnichannel Promotion Pricing* **>** *OPP Extensibility* **>**.

The promotion pricing service relies on the following functions and frameworks that need a secure setup and configuration:

Function/Framework	Documentation
SAP HANA XSA application server	<i>SAP HANA Administration Guide</i> on SAP Help Portal under https://help.sap.com/viewer/product/SAP_HANA_PLAT-FORM/ <i><Version></i> > <i>Administration</i> > <i>SAP HANA Administration Guide</i> > <i>Maintaining the Application Services Run-Time Environment</i> > <i>Maintaining the SAP HANA XS Classic Model Run-Time</i> > <i>SAP HANA XS Administration Tools</i> >
SAP HANA Database	<i>SAP HANA Administration Guide</i> on SAP Help Portal under https://help.sap.com/viewer/product/SAP_HANA_PLAT-FORM/ <i><Version></i> > <i>Administration</i> > <i>SAP HANA Administration Guide</i> > <i>Security Administration</i> >

Role Collection in SAP HANA XSA for the Processing of Calculation Requests

To authenticate the calculation requests, OPP uses basic authentication (user, password). Therefore, you must assign a special application role collection to the user to enable processing of the calculation requests.

For more information about XSA-specific configuration of the promotion pricing service, see the *Common Installation Guide for CARAB* on SAP Help Portal under <https://help.sap.com/viewer/p/CARAB> |> <Version> |> *Installation and Upgrade* |> *Common Installation Guide* |> *Post-Installation* |> *SAP Customer Activity Repository* |> *Configure Omnichannel Promotion Pricing for Use with SAP Customer Activity Repository* |> *Central Deployment of the Promotion Pricing Service* |>.

Secure Network Connection (HTTPS)

To provide a secure network connection (using https) for the transfer of calculation requests to the promotion pricing service, you have to do the following:

- Set up SAP HANA XSA for https connections only.
For more information, see the *SAP HANA Administration Guide* on SAP Help Portal under https://help.sap.com/viewer/product/SAP_HANA_PLATFORM/ |> <Version> |> *Administration* |> *SAP HANA Administration Guide* |> *Maintaining the Application Services Run Time Environment* |> *Maintaining the SAP HANA XS Classic Model Run Time* |> *SAP HANA XS Administration Tools* |>.
- Import the SAP HANA XSA server certificate on client side.
- Set up the client for https instead of http.

2.13 Enterprise Services Security

The following sections in the *SAP NetWeaver Security Guide* and documentation are relevant for all enterprise services delivered with the POS Data Transfer and Audit module of SAP Customer Activity Repository:

- *Web Services Security*
- *Recommended WS Security Scenarios*
- *SAP NetWeaver Process Integration Security Guide*

2.14 Payment Card Security According to PCI-DSS

2.14.1 Introduction





The Payment Card Industry Data Security Standard (PCI-DSS) was developed jointly by major credit card companies to create a set of common industry security requirements for the protection of credit card holder

data. Compliance with this standard is relevant for companies processing credit card data. For more information, see <http://www.pcisecuritystandards.org> .

This section is provided to assist you in implementing payment card security aspects. It also presents issues that you must consider in order for your deployment to be PCI-DSS compliant.

Caution

PCI-DSS includes more than the issues and information provided in this section. Ensuring that your system is PCI-DSS compliant is entirely the customer's responsibility. SAP is not responsible for ensuring that a customer is PCI-DSS compliant.

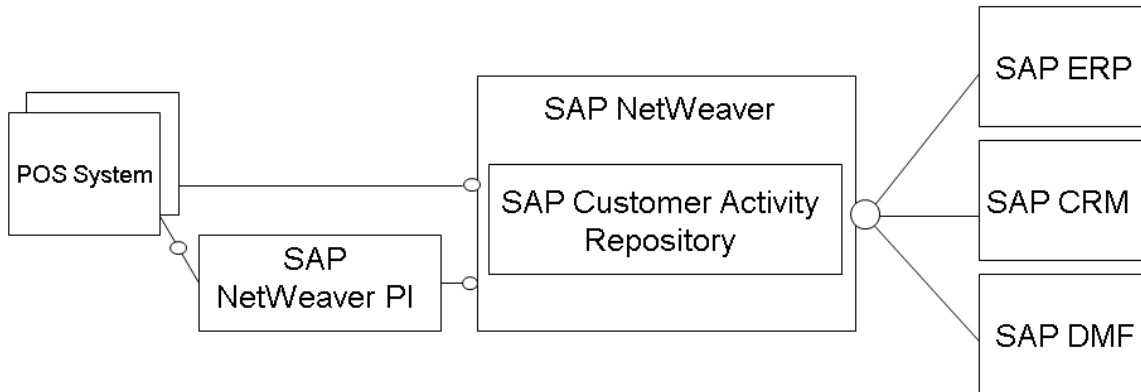
The PCI-DSS compliance information provided in this guide is application-specific. For general information on ensuring payment card security, see: <http://help.sap.com/erp>  [Security Information](#)  [Security Guide](#)  [Payment Card Security](#) .

For updated general PCI-DSS information, see also SAP Note [1609917](#) .

2.14.2 Credit Card Usage Overview

2.14.2.1 Introduction

The SAP Customer Activity Repository is an integral part of the Store Connectivity scenario. It is possible that each connection contains PCI-relevant data. As such, each communication line displayed in the diagram below could be subject to the PCI-DSS, as could each component. (PCI-DSS implications for each component are discussed in the individual security guides).



Communication Lines

2.14.2.2 SAP Customer Activity Repository

SAP Customer Activity Repository

SAP Customer Activity Repository can be used to support the Sales Audit transaction, during which credit card settlements are reviewed. As such, it must be configured to allow the Sales Auditor to access credit card data. SAP Customer Activity Repository can also serve as a transaction repository, where transactional data (including credit card data) can be aggregated and forwarded to other systems (Credit Card Settlement, SAP CRM, and SAP NetWeaver BW [for BI Content]) for additional processing.

The POS Inbound Processing Engine (included in the POS Data Transfer and Audit module) includes the following functionality to support your PCI-DSS compliance:

- Encryption of credit card data within PIPE using the `SAPCRYPTOLIB` encryption library
- Decryption of credit card data and decrypted display within PIPE
- Tracing and logging of decryption requests within PIPE
- Masking the display of credit card data in the POS Workbench
- Managing and distributing keys to the source POS

2.14.2.3 Detailed Data Flow of Credit Card Data

The PCI-DSS relevant data within a POS transaction consists of credit card data that can be stored within an application, and sensitive authentication data that must not be stored within an application.

Credit card data is transferred as part of the POS transaction data from a POS to SAP Customer Activity Repository; the service code is not transmitted with this data. Depending on the configuration of your transaction transfer application, the credit card data can be unencrypted or encrypted (symmetrically in an asymmetric envelope) using the PAYCRV application.

You can configure your system to transfer the credit card data using the HTTPS communication protocol, regardless of how the individual parts of the TLOG are encrypted.

The data is transferred from the POS to SAP Customer Activity Repository as follows:

1. The SOAP adapter residing in the adapter engine, the J2EE Stack, processes the HTTPS request. The SOAP adapter calls additional EJBs to encrypt the message, but the payload itself does not use SOAP-enveloping. Optionally, encrypted parts of the payload can be decrypted.
2. The SOAP adapter replaces all credit card data with dummy values and appends a privacy container as an RSA-encrypted attachment to the XML message using the SAP Store, Secure and Forward (SSF) API.
3. The XML messages are mapped to the format of the SAP Customer Activity Repository inbound interface and forwarded to SAP Customer Activity Repository through an RFC adapter (which also resides in the adapter engine).

You can configure the communication to use Secure Network Communication (SNC) for the Remote Function Call (RFC), which results in an encrypted data transfer between the SAP NetWeaver PI and SAP Customer Activity Repository.

During the lifetime of a message in SAP NetWeaver PI, all credit card data is stored in the database as part of the encrypted XML message attachment (both on the ABAP stack and the J2EE stack).

4. SAP Customer Activity Repository receives the TLOG messages and stores the content within the TLOG table in the transactional database.
5. The credit card data is separated as follows:
 - The credit card holder's name and the card's expiration date are stored in unencrypted format in the TLOG table. (The TLOG table content can be accessed by an authorized user in the POS Workbench, where the data is displayed in clear text format.)
 - The Permanent Account Number (PAN) is stored in encrypted and secure format using the PAYCRV application.

Only users with the required authorization can view the PAN in clear text format. Authorized users can request that the PAN be displayed in clear text format by choosing the corresponding button in the interface. Each time a user requests to view a PAN unmasked, it is logged in the application log.

1. The IDoc containing the POS transactional data is sent from SAP Customer Activity Repository to the SAP ERP POS Inbound over HTTPS. During the process, all PCI-DSS relevant data is unencrypted.
2. SAP ERP POS Inbound stores the data with an unencrypted or encrypted PAN using the PAYCRV application.

2.14.3 PCI-Related Customizing

2.14.3.1 SAP Basis Customizing Prerequisites

2.14.3.1.1 Introduction

SAP Customer Activity Repository PCI-DSS Security Customizing settings enhance the Customizing settings of SAP Basis. The required SAP Basis Customizing settings consist of:

- Installing and configuring the `SAPCRYPTOLIB` encryption library
- Establishing the payment card security settings
- Configuring the key versioning

Depending on your system, you may require additional configurations. Check your system to verify if you need to set up any of the following:

- Your POS to use the public key and version for encryption
- Your POS to transfer secured credit card data with the public key
- SAP NetWeaver PI for secure handling of the credit card data
- SAP ERP, SAP CRM, or other subsequent systems for secure handling of credit card data
- Secure IDoc and BAdI communication

2.14.3.1.2 Installation of the Encryption Library `SAPCRYPTOLIB`

The `SAPCRYPTOLIB` encryption library contains the functions required to encrypt credit card numbers.

You can define general settings for the execution of the encryption software in Customizing under ► [SAP NetWeaver](#) ► [Application Server](#) ► [System Administration](#) ► [Maintain the Public Key Information for the System](#) ►.

For more information on installing the `SAPCRYPTOLIB` encryption library, see the section [Installing SapCryptolib](#) in SAP Note [662340](#).

If you set the encryption with the `SSFA` transaction, you must use the `PAYCRV` application.

2.14.3.1.3 Payment Card Security Settings

Payment card security settings are applied to all newly created or changed POS transactions that include credit card information.

Basic Settings

You must configure the checking rules for payment card types as described in Customizing under [Cross-Application Components](#) > [Payment Cards](#) > [Basic Settings](#) > [Assign Checking Rule](#). These rules are used for entering the payment card number. To avoid possible errors when making entries, you can use the checking rules to verify that you have met the conditions of the relevant payment card type.

Settings for Payment Card Security

You must configure settings for the encryption, masking and access logs of payment cards. For information on configuring the settings, see Customizing under [Cross-Application Components](#) > [Payment Cards](#) > [Basic Settings](#) > [Make Security Settings for Payment Cards](#).

i Note

For SAP NetWeaver 7.0, you can access this activity from [Maintain View](#) `V_TCCSEC`.

Sample settings are as follows:

- [Security Level - Masked Display and Encrypted When Saved](#)
- [Access Log - Logging of Unmasked Display](#)
- [Additional Authorization Check for Unmasked Display](#) - Enabled
- Visible Characters for Masking:
 - [At Start](#) - 4
 - [At End](#) - 4
 - [Key Replacement Active](#) - Enabled

i Note

To enable encryption, choose the [Masked Display and Encrypted When Saved](#) option in the [Security Level](#) field.

⚠ Caution

If you select the [Masked Display, Not Encrypted When Saved](#) as the security level, credit card numbers may be lost in the SAP system. Only choose this setting if the payment data is not to be processed any further.

Maintain Payment Card Types

You must execute the steps described in this section only if you have set the [Masked Display and Encrypted When Saved](#) security level to the values described in the previous section.

To specify if payment card numbers for a credit card institution must be encrypted, enter the payment card type and assign a check rule. If you want to enable data encryption for a credit card type, choose the encryption check box.

For detailed instructions, see Customizing under [Cross Application Component](#) > [Payment Cards](#) > [Maintain Payment Card Type](#).

⚠ Caution

Note that if the encryption indicator for a credit card institution is not set, but the general security level is set to *Masked Display and Encrypted Save*, the security level for the credit card institution will be lowered to *Masked Display, No Encrypted Save*.

Masking Credit Card Number in IDocs

The `WECRYPTDISPLAY` transaction allows you to mask the display of credit card numbers in IDocs. To do so, you must make the following entries in the *Assignment: Encrypted Segment Field Display* table:

- *Message Type*: `WPUBON`
- *Segment Type*: `E1WPB06`
- *Field Name*: `KARTENNR`

ERP Customizing - Customizing of Encryption Save Mode

The Customizing of Encryption Save Mode allows you to specify if existing Globally Unique Identifiers (GUIDs) can be reused for different credit cards. You can create your own BAdI implementation. If you do not create your own, the application uses the following existing GUID:

Enhancement spot: `ES_WPOS_PCA_SECURITY`

BAdI definition: `WPOS_PCA_SECURITY`

2.14.3.2 SAP Customer Activity Repository Customizing

SAP Customer Activity Repository Customizing

In addition to the configuration settings described in the *SAP Basis Customizing Prerequisites* section, the SAP Customer Activity Repository Customizing activity defines how to store, process, and use sensitive data. For more information, see [SAP Customer Activity Repository](#) > [POS Data Management](#) > [POS Inbound Processing](#) > [General Settings](#) > [Define Security Profiles](#).

The table below shows the settings for the encrypted storage of payment card numbers and how they are displayed on the User Interface. The encryption and display settings are:

Setting	Description	Example
Security Profile	Displays the identifier of the security profile.	0001
Description	Describes the security profile.	SAP Standard Security Profile
SSF Application	Identifies the <code>STRUST</code> application, which is part of SAP Basis.	<code>PAYCRV</code> (versioned keys)
Save Mode	<p>Indicates whether the reference of the encrypted payment card number, which is a GUID (Globally Unique Identifier), is always re-used for the same payment card number. Otherwise different GUIDs are assigned for the same payment card number.</p> <p>There is a trade-off between performance and increasing encryption table size during encryption, but there is no performance impact during decryption.</p> <p>As an example, this could provide you with the option to Re-use Existing Entry for a cross-selling analysis of a credit card number or GUID in a further process/system. This setting does not affect your PCI-DSS compliancy. However, according to PCI-DSS, cross-selling analysis with card numbers should not be used, and data mining on a credit card could invalidate your PCI-DSS compliancy.</p>	Reuse Existing Entry
Security Check	The security check must be set to <i>Allow Security Level Check</i> to be compliant with the PCI-DSS standard. This allows SAP Customer Activity Repository to work and check according to the payment card settings in the <code>TCCSEC</code> table in SAP Basis.	Allow Security Level Check

2.14.4 Rotation or Changing of Encryption Keys

2.14.4.1 Introduction

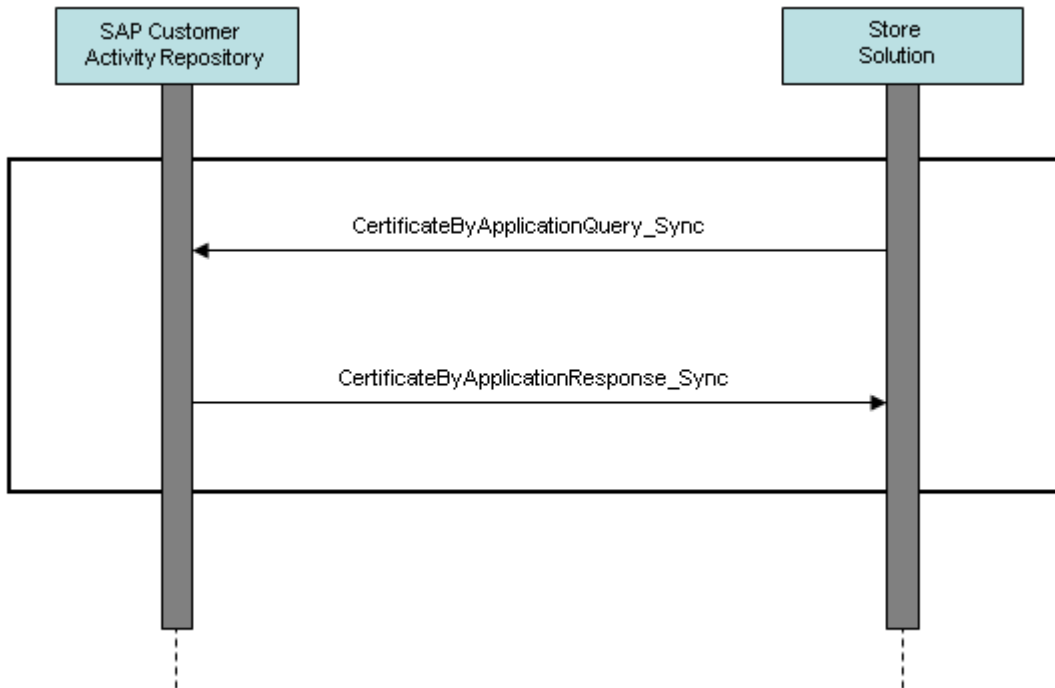
To be PCI-DSS compliant, encryption keys must be changed on a regular basis. See SAP Note [1151936](#) for more information about key replacement for encryption of payment card data.

2.14.4.2 Key Distribution Web Service

PCI-DSS requires that credit card data must be encrypted if it is transmitted over open, public networks. To fulfill this requirement, the Key Distribution Web service was implemented for the distribution of X.509 certificates. The Web service was under the NetWeaver governance approach. No SAP Business Objects or ARIS content are delivered with the Web service.

2.14.4.3 Pull Mechanism in SAP Customer Activity Repository

A pull mechanism is used between SAP Customer Activity Repository and the POS. The POS is the Web service consumer and SAP Customer Activity Repository is the service provider. The communication between the two systems is peer-to-peer and does not use SAP NetWeaver PI.



Pull Mechanism

2.14.4.4 Message Choreography SAP Customer Activity Repository and POS Store Solution

Certificates sent using Web services have an X.509 format, the standard format for public key certificates.

The Web service has a query/response pattern that contains one service interface for the query and one for the response. These service interfaces are modeled on the SAP NetWeaver PI system (SAP ABA 7.02 and SAP ABA 7.20). SAP NetWeaver PI core and global data types are used as the data types.

Service Interface

The `CertificateByApplicationQueryResponse_In` service interface, which has a query/response communication pattern, contains the following three messages:

Name	Type	Role	Description
<code>CertificateByApplicationQuerySync</code>	Message Type	Request	Request for the certificate and the application
<code>CertificateByApplicationResponseSync</code>	Message Type	Response	Response that contains the certificate and the version

Name	Type	Role	Description
StandardMessageFault	Fault Message Type	Fault	Fault message

CertificateByApplicationQuery_sync is the message type for the request section of the CertificateByApplicationQueryResponse_In service interface. It contains the SSF application for which the certificate is being requested.

Name	Type	Description
Application	String	SSF Application

The CertificateByApplicationResponse_sync message contains the current certificate and version of the requested application.

Name	Type	
Certificate	BinaryObject	X
Version	IntegerValue	C
Log	Log	G

The SSF application is required for the following reasons:

- It is the importing parameter of the SSFV_GET_CURRENT_KEYVERS_RFC function module, which is called from the proxy class.
- Without the SSF application, it is not possible to get the key version.

```
IMPORTING
  VALUE (IF_APPLIC) TYPE SSFAPPL
EXPORTING
  VALUE (EF_KEYVERSION) TYPE SSFKEYVERS
  VALUE (EF_CERTIFICATE) TYPE XSTRING
EXCEPTIONS
  VERSION_NOT_FOUND
  CERTIFICATE_NOT_FOUND
```

The corresponding class of the proxy contains a method with an importing parameter that is the request message type and an exporting parameter that corresponds to the response message type.

SAP Customer Activity Repository Keys

Key rotation in SAP Customer Activity Repository is performed using the STRUST transaction. SAP Customer Activity Repository also provides you with a key management tool. The /POSDW/KEY_DISTRIIB_DISPLAY report displays information about used and distributed key versions.

→ Recommendation

The key management tool performs a selection on a large central log database that can be used by many applications, therefore you must make the selection as specific to your needs as possible. For example, select the following:

- Application log object: `KEY_DIST`
- SSF application: `PAYCRV`

The results of the selection allow you to identify:

- Any key versions activated for deletion
- The key versions still in use
- The system to which the key was distributed

2.14.4.5 Key Distribution User Interface

The `/POSDW/DISP_KEYV` transaction displays a list of the key versions and allows you to do the following:

- Track which users required a key
- Link to the transaction where an administrator can perform key management
- Flag a key version for deletion. This requires a manual verification by the administrator to ensure that there are no inbound messages using the encrypted key that is flagged for deletion.

Customizing

At least one key version must exist. An administrator can create key versions using the `SSFVA` transaction.

Process

Every time the user uses the Key Distribution Web service, the information is saved in the application log. The key version is written in a message structure of the log. The user name, date, time, `KEY_DISTR` application log object, `SSFV` application name, transaction and log number are also written to the log.

An administrator can run the `/POSDW/KEY_DISTRIB_DISPLAY` report to search the application log and display information. The existing backend capacity of the application log provides search functionality, persistence of data and retrieval functionality from the database. The displayed information is read-only.

After the administrator manually verifies in the POS, SAP NetWeaver PI, and SAP Customer Activity Repository to ensure that they do not contain encrypted information with a particular key version, the administrator can flag this key version for deletion using the corresponding button (under the description `FLG_DEL`). The rest of the deletion process can be carried out by choosing the `KEY_MGNT` button to execute the `SSFVA` transaction.

2.14.5 Masked/Unmasked Display

The payment card security settings, described in the [SAP Customer Activity Repository Customizing \[page 105\]](#) section, specify the following:

- Security level - with or without encryption/masking
- Update of the access log with unmasked display
- Selection of additional authorization check with unmasked display
- Number of unmasked characters displayed

In SAP Customer Activity Repository, credit card numbers can only be displayed in the POS Workbench (using the `/POSDW/MONO` transaction). When a user displays the details of a sales transaction with a means of payment that includes a credit card settlement segment, the credit card details are masked (that is, an asterisk (*) is used to replace each number). If the `B_CCSEC` authorization object exists in the user's master record, the user has the authorization level required to display the credit card details in an unmasked form. The user can display the credit card details using the magnifier icon next to the credit card number. This action triggers a new entry in the access log and opens a new window that displays the unmasked details.

The logging mechanism allows you to trace which user has displayed which payment card and when. If the user does not have the authorization level required to display unmasked credit card numbers, the magnifier icon is not displayed in the POS Workbench.

Caution

In order for a user to be able to view any credit card information in the POS Workbench, you must enable the `W_POS_CCNR` authorization object for activity 02, Display Credit Card Number.

The SAP Basis authorization role `B_CCARD` is enhanced to allow the display of unmasked credit card data.

The `/POSDW/SALES_AUDIT` authorization role allows auditors to review credit card settlement information.

At a minimum, the following credit card data fields must be encrypted:

- Credit card expiration date
- Credit card holder name
- Authorization number
- Credit card number

The `W_POS_FSPR` authorization object specifies the protection level required for this sensitive data. The authorization object has only one field, *Field Selection Profile*. It is used to specify if data is to be displayed in the interface or not, depending on which profiles are added to it for a specific user or role.

In Customizing for SAP Customer Activity Repository, you can define field selection profiles. This allows you to define what information is displayed for a user profile, that is, which list of structures and fields are visible to a user based on a user's profile.

2.14.6 Logging of Payment Card Number Access

SAP Customer Activity Repository uses the following SAP Basis reports and programs to display and delete logs about user access to unmasked credit card data:

- The `CCSEC_LOG_SHOW` transaction - allows users to display a log of users who have viewed decrypted credit card information in the POS Workbench. To access the log, a user must have authorization for activity 71 in the `B_CCSEC` authorization object.
- The `CCSEC_LOG_DEL` transaction - allows users to delete log records about users who have accessed unmasked credit card data in the POS Workbench. A user can only delete log records that are at least one year old. To activate the deletion program, a user must have authorization for activity 06 in the `B_CCSEC` authorization object.

i Note

The integrity of the log does affect your PCI-DSS compliance. If the log is not secured, your PCI-DSS compliance is compromised.

2.14.7 Encryption, Decryption, and Storage of Encrypted Credit Card Numbers

2.14.7.1 Introduction

SAP Customer Activity Repository stores transactional data in the `/POSDW/TLOGF` table. The table contains the `/POSDW/LRAW` transactional data, which is stored in a 32000-length LRAW string. This is the only table in SAP Customer Activity Repository in which credit card data is stored. All credit card data stored in the LRAW strings must be encrypted.

2.14.7.2 SAP Customer Activity Repository

IDoc Encryption

BADIs are used to encrypt and decrypt data. The `IDOC_DATA_MAPPER` BAdI is used to encrypt and save data to the IDoc database. The `IDOC_DATA_CRYPTION` is used to read and decrypt data from the IDoc database.

Three IDoc types contain credit card numbers:

- `WPUBON01`
- `WPUTAB01`
- `/POSDW/POSTR_CREATEMULTIPLE02`

The `/POSDW/PCA_IDOC_MAP` BAdI is used to encrypt credit card numbers in the `WPUBON01` and `WPUTAB01` IDocs. The `/POSDW/PCA_IDOC_CRYPT` BAdI implementation is used to decrypt credit card numbers in the `WPUBON01` and `WPUTAB01` IDocs.

To enable the encryption of credit card numbers in the /POSDW/POSTR_CREATEMULTIPLE02 IDoc type, the CARDGUID and ENCTYPE fields have been added to the /POSDW/E1BPCREDITCARD segment of the /POSDW/POSTR_CREATEMULTIPLE02 IDoc basic type. The /POSDW/PCA_IDOC_MAP and /POSDW/PCA_IDOC_CRYPT BAdIs have been enhanced to process the updated segment type.

Processing of Incoming Encrypted Data

The /POSDW/BAPI_POSTR_CREATE BAPI, the /POSDW/CREATE_TRANSACTIONS_EXT remote function module and the service inbound interfaces have been enhanced to contain a secured data segment or cipher; they have all been asymmetrically encrypted using PKCS7.

The decrypted secured data must conform to a defined XML structure and is converted to an internal table for later processing by the /POSDW/XSLT_SECUREXMLTOTABLE simple transformation.

2.14.7.3 SAP ERP

IDoc Encryption Process

Once the IDoc data records have been sent to the IDOC_PCI_ENCR_IM BAdI implementation, the encryption of the credit card data begins. The encryption process is as follows:

1. The segment in the IDoc record that contains the credit card information is identified.
2. The encryption process maps the data from the E1WPZ02 and E1WPB06 segments to the internal structure.
3. The data is used to retrieve the card GUID, the name of the credit card institution number, and the credit card number.
4. The security level check is performed.
In Customizing, each credit card institution is assigned a security level. If the security level is set to 2, the credit card number is encrypted; if the security level is set to 1, the credit card number is masked.
5. The card GUID and encryption type are mapped to the structure for decryption.
6. A message is created to confirm the success or failure of the encryption.
7. The consistency check is performed.

Decryption Process

Once the IDoc data records have been sent to the IDOC_PCI_DECRYPTION_IM BAdI implementation, the decryption of credit card data begins. The decryption process is as follows:

1. The segment in the IDoc record that contains the credit card information is identified.
2. The decryption process maps the data from the E1WPZ02 and E1WPB06 segments to the internal structure.
3. The data is used to retrieve the card GUID, the encryption type, and the credit card number.

The encryption type is currently a fixed value set to 2.

1. The credit card number is decrypted.
2. A message is created to confirm the success or failure of the decryption.

Secure Handling of Credit Card Information During POS Processing

In SAP Customer Activity Repository, credit card data is handled during inbound and outbound processing. Inbound and outbound processing are executed using IDoc types.

During outbound processing, store systems are provided with customer-specific credit card master data. Outbound processing is executed using the `WP_PER01` IDoc type. However as this IDoc type is for internal use only, it cannot be used for the encryption of credit card data.

During inbound processing, credit card details are a payment attribute of sales transactions. Encryption is required on the IDoc database to support IDoc types that contain credit card data. No other changes are required to securely handle credit card data:

- No encryption of the customer POS database is required as no business data or credit card data is stored in it.
- Follow-on applications, such as the Retail Information System (RIS) or Business Warehouse (BW), are only provided with masked credit card numbers in order to perform cross-selling analysis, therefore they do not require to support encryption.
- No changes are required to the user interfaces of the POS Monitor or Sales Audit because the behavior remains the same as it was before the IDoc database was encrypted: the credit card information is provided in clear text format. Credit card information is temporarily available in clear text during inbound processing to internal applications and when the data is transferred to follow-on applications (such as Analytics and Sales & Distribution). However, as the risk of losing credit card data at this point is minimal, no changes for encryption are required.
- Only authorized users can see the credit card data; regular users cannot see secure data while it is being processed internally.

2.14.8 Migration

The `/POSDW/PCA_MIGRATION` report allows you to move decrypted or encrypted credit card numbers from other systems to masked or encrypted credit card numbers in SAP Customer Activity Repository. You can access the `/POSDW/PCA_MIGRATION` report using the `/POSDW/PCAM` transaction.

To use the `/POSDW/PCA_MIGRATION` report, you must have authorization for activity O2 in the `W_POS_TRAN` authorization object. The required underlying security settings must also be configured.

You can consult the migration log to determine for which transactions the data was not migrated successfully. The log provides an overview, by store and transaction date, of how many transactions were found and whether or not the data was successfully changed. If an error occurred for a transaction, no credit card numbers or information is displayed in the log, only the transaction index, store number, posting date, and task number are provided.

Transaction data can only be changed if it is not posted in any task. All tasks for the transaction must have one of the following statuses:

- Ready
- Error
- Canceled
- Canceled with Warning

Only transaction data that is not posted to a task can be changed. All transactions must have one of the following statuses:

- Ready
- Error
- Canceled
- Canceled with Warning

i Note

Only transaction data from a task with a *Completed* status can be changed.

2.14.9 Deletion of Credit Card Storage

You may be required to delete credit card data, for example, if credit card information is outsourced or in order to improve your PCI-DSS compliance. Once TLOG transactional data has been archived, SAP Customer Activity Repository assumes that the old credit card information is no longer accessible and that it will be deleted eventually. The process deleting old credit card information takes approximately two years as the old data is overwritten by the new data.

The `RCCSECV_DATA_DEL` SAP standard report from the `CCSECV_DATA_DEL` transaction allows you to delete unused, encrypted credit card data. By default, credit card data is considered unused when it has not been used in a report or transaction for a minimum of 500 days.

If you have any existing transactions that contain credit card information without an assigned security level, you can use the `/POSDW/PCAM` transaction to migrate it.

2.14.10 Archiving

Only masked credit card information can be archived. Clear text credit card information must not be archived. Archiving encrypted credit card information is problematic because archived data must remain unchanged. PCI-DSS requires that encrypted credit card information be re-encrypted with a different key, for example, with key rotation. However, it is not possible to change data in this way in an archive.

Archiving must be disabled on applications and transactions that do not retain the encryption state of the source data, such as on SAP NetWeaver PI, ABAP Web Services, or Forward Error Handling (FEH). IDocs that contain credit card information must not be archived. The following IDocs are affected because they may contain credit card information:

- `WPUBON` - POS interface: Upload sales docs (receipts) non-aggregated

- WPUTAB- POS interface: Upload day-end closing POS
- WPUFIB - POS interface: Upload Fin.Acc. interface SRS/POS
- /POSDW/POSTR_CREATEMULTIPLE - PIPE: BAPI for Creating Several POS Transactions

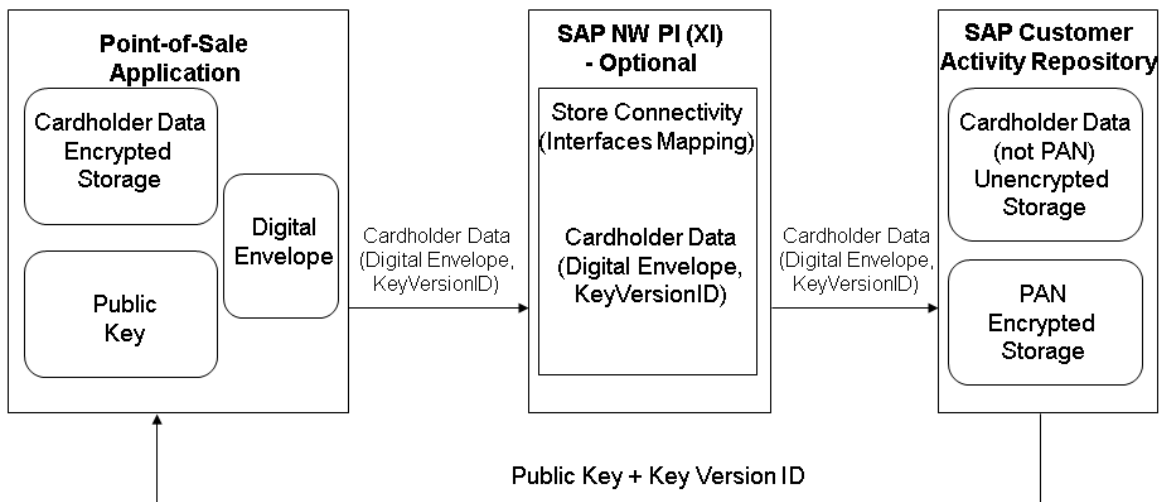
You use the CA_PCA_SEC archiving object to archive the encrypted credit card numbers.

You use the following object to archive TLOG transaction data (which may also contain credit card information):

- /POSDW/TLF

2.14.11 Interfaces for IDoc/Services

In a typical SAP Customer Activity Repository landscape, credit card information is communicated as follows:



Credit Card Information Communication Flow

See the [Detailed Data Flow of Credit Card Data \[page 102\]](#) section for more information.

The following interfaces are available for use:

- Web services `CertificateByApplicationQuery_Sync` and `CertificateByApplicationResponse_Sync` are used as a pull mechanism from SAP Customer Activity Repository.

- Store Connectivity 2.0 or 3.0 can optionally be used to map the encrypted data container to the SAP Customer Activity Repository inbound proxy.

The interface determinations must contain the

POSLog_To_PointOfSaleTransactionERPBulkCreateRequest_In interface mapping

- The IDOC_DATA_MAPPER IDoc for database encryption is called before saving data to the IDoc database and IDOC_DATA_CRYPTION IDoc for database decryption is called after reading data from the database.
- The POSDW/BAPI_POSTR_CREATEBAPI, the /POSDW/CREATE_TRANSACTIONS_EXT remote Function Module and the service inbound interfaces have been enhanced to contain a secured data segment or cipher; they have all been asymmetrically encrypted with PKCS7. The decrypted secured data must conform to a defined XML structure and is converted to an internal table for processing later by the /POSDW/XSLT_SECUREXMLTOTABLE transformation.

The following IDoc types contain credit card numbers:

- WPUBON01:
Encryption in BAdI function /POSDW/PCA_IDOC_MAP
- WPUTAB01:
Encryption in BAdI function /POSDW/PCA_IDOC_CRYPT
- /POSDW/POSTR_CREATEMULTIPLE02:
To enable the encryption of the credit card number in the IDoc type, the CARDGUID and ENCTYPE fields have been added to the /POSDW/E1BPCREDITCARD segment of the IDoc basic type.

⚠ Caution

IDoc segments cannot store credit card numbers in clear text due to the PCI-DSS compliance. Once an IDoc is being processed within the IDoc Framework, all values are temporarily stored, including the credit card number in clear text format.

For more information about how to process IDocs that contain credit card information, see [Handling Sensitive Data in IDocs](#) in the SAP NetWeaver [Security Guide ALE \(ALE Applications\)](#) .

2.14.12 RFC Debugging

You must disable RFC debugging when you process credit card information in a productive system. Do not activate the [Set RFC Trace](#) option in your productive system. If this option is activated, the system will save all RFC call input data in clear text to file. If credit card numbers (including the PAN) are included in calls to a function module, then this data would be stored to the same file. According to PCI-DSS, credit card numbers must be encrypted when stored, therefore if you activate the [Set RFC Trace](#) option you would no longer be PCI-DSS compliant.

2.14.13 Forward Error Handling

In SAP Customizing, you must disable Forward Error Handling (FEH) for all services that contain credit card numbers.

2.14.14 Card Verification Values

You must not process any asynchronous services that contain a card verification code or card verification value (CVV) data (such as CAV2, CID, CVC2, CVV2). The payload of asynchronous services is persisted in the database until the service is processed, however, PCI-DSS does not allow the persistence of card verification values. Synchronous services can be processed because their payload is not persisted.

i Note

In SAP services, these values correspond to the `PaymentCardVerificationValueText` SAP Global Data Type (GDT).

2.15 Security-Relevant Logging and Tracing

SAP Customer Activity Repository relies on the logging and tracing mechanisms of SAP NetWeaver.

For more information on tracing and logging, see [Auditing and Logging](#) in the *SAP NetWeaver Security Guide*.

The SAP Customer Activity Repository application (and specifically the POS Data Transfer and Audit module) delivers and uses `/POSDW/PIPE`, an SAP NetWeaver Application Server ABAP application log object for application log entries. This object contains the following subobjects:

- `CHANGE_TASKSTATUS`: Used for task status change related operations
- `CREATETREX`: Used for TREX index-related operations
- `CREDITCARD_MIGRATION`: Used for credit card migration operations
- `DELETE`: Used for operations related to transaction deletion
- `DELETE_AGGREGATE`: Used for operations related to transaction aggregate deletion
- `IDOC_DISPATCHER`: Used for the execution of IDoc Dispatcher processing
- `INBOUND_DISPATCHER`: Used for the executions of Inbound Processing Dispatcher using Queue
- `OUTBOUND_DISPATCHER`: Used for execution of Outbound Processing of Aggregates
- `PIPEDISPATCHER`: Used for execution of PIPE/POS Dispatcher processing
- `REFRESH_INDEX`: Used for operations related to reconstruction of the transaction index
- `REORG_TIBQ`: Used for operations related to the reorganization of the inbound queue for point-of-sales transactions (TIBQ)
- `STOREDAYCHANGE`: Used for operations related to POS Data Key Changes
- `XML_IN`: Used for execution of the Import POS Transaction as XML File
- `XML_OUT`: Used for execution of the Export POS Transaction as XML File
- `DELETE_PLOG`: Used for the deletion of process log entries
- `DELETE_TLOGUS`: Used for the deletion of unprocessed sales
- `MAINTAIN_PARTITIONS`: Used to maintain partitions
- `REFRESH_EXTENSIONS`: Used for the migration of customer enhancement extension segments
- `RESTORE_ARCHIVE`: Used to restore archived TLOG entries
- `TLOG_MIGRATION`: Used for POS Transaction Data Migration

Logging and Tracing for Customizing Changes

To evaluate changes the individual SAP Customer Activity Repository Customizing tables, you can activate the logging of changes to table data:

1. Use transaction **SE13** to change the technical settings of the desired table and activate the logging of changes.
2. Use transaction **SCU3** to evaluate the generated logs.

Logging of Payment Card Number Display

SAP Customer Activity Repository users with the appropriate authorization (**B_CCSEC** authorization object) can view complete credit card numbers in clear text in the POS Workbench. When a user displays a payment card number in clear-text format, SAP Customer Activity Repository logs it in an access log. SAP Customer Activity Repository allows you to perform a trace to determine which user has displayed a particular card number and when. You can make changes to the authorization log using one of the following programs:

Program	Description	Prerequisite
CCSEC_LOG_SHOW	Allows you to evaluate the access to payment card data	Authorization for activity 71 in the B_CCSEC authorization object
RCCSEC_LOG_DEL	Allows you to delete log records that are more than one year old	Authorization for activity 06 in the B_CCSEC authorization object

2.16 Services for Security Lifecycle Management

Use

The following services are available from Active Global Support to assist you in maintaining security in your SAP systems on an ongoing basis.

Security Chapter in the EarlyWatch Alert (EWA) Report

This service regularly monitors the Security chapter in the EarlyWatch Alert report of your system. It tells you:

- Whether SAP Security Notes have been identified as missing on your system.
In this case, analyze and implement the identified SAP Notes if possible. If you cannot implement the SAP Notes, the report should be able to help you decide on how to handle the individual cases.
- Whether an accumulation of critical basis authorizations has been identified.
In this case, verify whether the accumulation of critical basis authorizations is okay for your system. If not, correct the situation. If you consider the situation okay, you should still check for any significant changes compared to former EWA reports.

- Whether standard users with default passwords have been identified on your system.
In this case, change the corresponding passwords to non-default values.

Security Optimization Service (SOS)

The Security Optimization Service can be used for a more thorough security analysis of your system, including:

- Critical authorizations in detail
- Security-relevant configuration parameters
- Critical users
- Missing security patches

This service is available as a self-service within SAP Solution Manager, as a remote service, or as an on-site service. We recommend you use it regularly (for example, once a year) and in particular after significant system changes or in preparation for a system audit.

Security Configuration Validation

The Security Configuration Validation can be used to continuously monitor a system landscape for compliance with predefined settings, for example, from your company-specific SAP Security Policy. This primarily covers configuration parameters, but it also covers critical security properties like the existence of a non-trivial Gateway configuration or making sure standard users do not have default passwords.

Security in the RunSAP Methodology / Secure Operations Standard

With the E2E Solution Operations Standard Security service, a best practice recommendation is available on how to operate SAP systems and landscapes in a secure manner. It guides you through the most important security operation areas and links to detailed security information from SAP's knowledge base wherever appropriate.

More Information

For more information about these services, see:

- EarlyWatch Alert: <https://support.sap.com/support-programs-services/services/earlywatch-alert.html>
- Security Optimization Service / Security Notes Report: <https://support.sap.com/support-programs-services/services/security-optimization-services.html>
- Comprehensive list of Security Notes: <https://support.sap.com/securitynotes>
- Configuration Validation: <https://support.sap.com/solution-manager/processes/change-control-management.html>
- Implement SAP: <https://support.sap.com/support-programs-services/methodologies/implement-sap.html>

3 Business Scenario

Get information on the SAP Customer Activity Repository business scenario and the business processes it contains.

Use

You use the SAP Customer Activity Repository business scenario to collect transactional data that was previously spread over multiple independent applications into one common foundation. For example, this scenario includes a business process that allows you to receive transactions from the point-of-sale (POS) terminals in your stores, cleanse and audit this data, and store it in SAP Customer Activity Repository.

You use the other business processes included in this scenario to obtain transactional data that can originate from a number of possible sources (for example, SAP CRM) and is stored in SAP ERP in the form of sales documents.

Once this data is available in SAP Customer Activity Repository, these business processes allow you to harmonize the transactional data originating from several order channels and to perform a wide spectrum of analytical operations on this data. The analyses you perform can improve decision-making in your retail business. For example:

- Do some articles/products sell better in a particular channel? Based on this information, should my assortment per order channel be updated?
- What is the profitability of the different order channels in my retail business?
- What products does a particular customer buy in the store or on the web?

i Note

The customer for a given point-of-sale (POS) transaction can only be identified if the customer uses a loyalty card at the time of purchase.

- What is my current inventory (including unprocessed POS transactions)?
- What are the forecasted sales for a given product/location combination?
- Do I have any product on-shelf availability issues in my stores?

3.1 Performing POS Data Transfer and Audit

You can use this business process to manage point-of-sale (POS) transactions. During this process, cash register sales data from individual stores is transmitted (typically using trickle feed) to SAP Customer Activity Repository. Administrators monitor and troubleshoot the inbound queues.

After the transactional data is received, you can process, cleanse and audit the data. Auditors ensure the consistency of the sales transaction data.

You can also use outbound tasks of SAP Customer Activity Repository to send the processed transactional data to follow-on applications. Alternatively, you can store transactional data in the repository. Any consuming applications can access the stored data in near-real-time through SAP HANA views provided in the SAP HANA content for SAP Customer Activity Repository.

Process

1. Define workbench display parameters.
2. Perform short/over balancing.
3. Check data transfer.
4. Control task processing.
5. Analyze error messages.
6. Display follow-on documents.
7. Search for POS transactions.
8. Execute mass change for POS transactions (optional).

Result

Transactional data received from your stores is received, processed and stored in SAP Customer Activity Repository. This data is sent to all required follow-on applications and is made available to any consuming applications through SAP HANA views.

3.2 Performing POS Transaction Data Migration

Use

You can use this business process to move POS transaction data from an existing implementation of SAP NetWeaver BI Content (version 7.x6 or earlier) or SAP POS DM 1.0 to SAP Customer Activity Repository 1.0. You only need to perform this process if you want to re-use the POS transaction data already accumulated in your existing implementation to a new SAP Customer Activity Repository implementation.

Process

1. Read the *SAP POS DM and SAP Customer Activity Repository POS Transaction Data Migration Guide*. You can find this guide on SAP Help Portal for SAP Customer Activity Repository applications bundle under <https://help.sap.com/viewer/p/CARAB> ► <Version> ► *Integration* ►.
2. Examine your Customizing settings on the target SAP Customer Activity Repository system and disable all tasks set to *Immediate Processing*, as described in the migration guide.

3. Configure and execute the *POS Transaction Data Migration Report*.

Result

POS transactions are migrated from the source system to the new SAP Customer Activity Repository system.

3.3 Performing POS Sales Analysis

Use

You can use this business process to analyze POS sales data stored in SAP Customer Activity Repository in near real-time.

POS transactions are transferred to the repository using the *Performing POS Data Transfer and Audit* business process. Trickle feed posting of transactions from connected stores combined with the speed of the underlying SAP HANA database enables you to quickly analyze POS sales data.

Different roles in your retail organization need to analyze POS data at different levels. Some need to analyze data at the transaction line item level, and others need to quickly roll up POS transactional data to various aggregation levels. All these analysis scenarios are supported by this business process.

Prerequisites

Carry out the *Performing POS Data Transfer and Audit* business process.

Process

1. Process POS transaction data for analysis using tasks (if required).
2. Filter data by customer identifier (optional).
To narrow your results, you can apply a filter to the Customer Identifier field.
3. Filter data by order channel (optional).
To narrow your results, you can apply a filter to the Order Channel field to specify one or more channels.
4. Expose POS sales KPIs through SAP HANA VDM.
The POSSalesQuery is a set of characteristics and measures from the transaction log of the POS system combined with master data from SAP ERP. The amount measures are available with currency conversion in the display currency field.

Result

POS transaction data and Key Performance Indicators (KPIs) are made available using SAP HANA views included in SAP HANA content for SAP Customer Activity Repository.

3.4 Performing Inventory Visibility Analysis

You can use this business process to get accurate, near-real-time visibility of inventory during store operations, sales and other business processes. Current inventory considers SAP ERP unrestricted stock amounts and POS transactions stored in SAP Customer Activity Repository that are not yet posted to SAP ERP (unprocessed sales.) Combining these figures gives you a more accurate view of the current inventory levels in your retail business.

Implementing this business process to obtain a near-real-time snapshot of your inventory levels gives these benefits:

- Transparency on critical stock levels
- Overview of critical inventory characteristics and KPIs such as valuated stock, unprocessed sales quantities, stock valuations, and safety stock levels
- Answers to critical questions, such as *"Does this store have inventory in stock for a given article?"*
- A high degree of customer satisfaction when combined with sales, service or other store operation business processes.

Prerequisites

Carry out the [Performing POS Data Transfer and Audit](#) business process.

Process

1. Configure splitting of structured articles.
You execute SAP Customizing in SAP ERP to see the impact of splitting structured articles on current stock.
2. Obtain current SAP ERP stock quantities.
The stock quantities are replicated to SAP Customer Activity Repository using SAP Landscape Transformation (SLT).
3. Determine unprocessed sales from the POS transactions worklist.
An unprocessed sale is a POS sales transaction that has not yet been sent to SAP ERP for posting through two-step task processing.
4. Expose near-real-time inventory counts through the SAP HANA Virtual Data Model (VDM).

The stock quantities information in SAP Customer Activity Repository is combined with quantities from unprocessed sales to derive the current stock in stores. The standard inventory visibility content includes three stock types:

- Unrestricted stock
- Stock in transit
- Stock in transfer

The following SAP HANA VDMs expose inventory visibility KPIs:

- InventoryVisibilityQuery
- InventoryVisibility
- InventoryVisibilityStockQuantities

Result

Near-real-time inventory data and KPIs are made available using SAP HANA views included in SAP HANA content for SAP Customer Activity Repository.

3.5 Performing Sales (Billing) Document Analysis

Use

You can use this business process to analyze the sales data that is generated in a source SAP ERP and made available in near-real-time in SAP Customer Activity Repository.

As sales take place, they are processed by SAP ERP, where corresponding sales documents are created. Certain types of sales documents, such as billing documents, are made available in SAP Customer Activity Repository in near-real-time.

Different roles in your retail organization need to analyze billing document data at different levels of detail. Some need to analyze data at the billing document line item level, and others need to quickly roll up billing document data to various aggregation levels. All these analysis scenarios are supported by this business process.

Process

1. Obtain current sales documents from SAP ERP
Sales (billing) document transactions are replicated from SAP ERP into Customer Activity Repository using the SAP Landscape Transformation (SLT) application.
2. Filter data by customer Identifier (optional).
To narrow your results, you can apply a filter to the Customer Identifier field.
3. Filter data by order channel (optional).
To narrow your results, you can apply a filter to the Order Channel field to specify one or more channels.

4. Expose Sales KPIs through SAP HANA VDM.
The BillingDocumentItemQuery is a set of characteristics and measures from the replicated Sales (Billing) Document combined with master data from SAP ERP.

Result

Billing document data and Key Performance Indicators (KPIs) are made available using SAP HANA views included in SAP HANA content for SAP Customer Activity Repository.

3.6 Performing Multichannel Sales Analysis

Use

You can use this business process to analyze multichannel sales data available in SAP Customer Activity Repository.

POS transactions created in your brick-and-mortar stores, also referred to as the store order channel, are transferred to the repository using the [Performing POS Data Transfer and Audit](#) business process.

Sales that take place through other order channels in your business, are processed by SAP ERP, where corresponding sales documents are created. Certain types of sales documents, such as billing documents, are made available in SAP Customer Activity Repository in near real-time.

SAP Customer Activity Repository consolidates sales data from these order channels to give you a holistic view of sales data in near-real-time. Capturing sales data from different order channels in one single platform provides:

- Near-real-time access and visibility into customer sales data across channels.
Different roles in your retail organization need to analyze multichannel sales data at different levels. Some need to analyze data at the line item level, and others need to quickly roll up sales data to various aggregation levels. All these analysis scenarios are supported by this business process.
- Near-real-time flash reports within split seconds
- Ability to compare current sales with sales from last year as well as forecasted sales
- Data required by follow-on business scenarios such as new segmentation and call center scenarios, as well as integration with SAP Customer Engagement Intelligence.

Prerequisites

Carry out the [Performing POS Data Transfer and Audit](#) business process.

Process

1. Prepare POS transaction data (SAP Customer Activity Repository).
Ensure that order channels are assigned to POS transactions at the line item level, and are based on the settings of the Assign Order Channels to Sales Item Type Customizing activity.
2. Obtain sales documents from SAP ERP (SAP Customer Activity Repository).
3. Consolidate multichannel data for analysis (SAP Customer Activity Repository).
A virtual data model (VDM) is provided that brings together the POS transactions and sales documents.
4. Filter data by customer identifier (optional) (SAP Customer Activity Repository).
To narrow your results, you can apply a filter to the Customer Identifier field.
5. Filter data by order channel (optional) (SAP Customer Activity Repository).
To narrow your results, you can apply a filter to the Order Channel field to specify one or more channels.
6. Enable forecasting KPIs (SAP Customer Activity Repository).
7. Expose figures using SAP HANA views (SAP HANA).
The following templates are available:
 - Multichannel Forecast measures view exposes the forecast from DDF/UDF and has a dependency on the table /POSDW/TLOGF and /DMF/UFC_TS
 - Sales and Forecast comparison by date
 - Multichannel Sales By Location Week Comparison
 - Multichannel Sales By Article Week Comparison
 - Multichannel Sales By Article Location
 - Multichannel Sales In Display Currency
 - MultiChannelSalesQuery, which is a set of characteristics and measures that combines measures from POS and Billing documents with master data from SAP ERP. The amount measures are available with currency conversion in the display currency field.
8. View Multichannel Sales Analytics Dashboards (SAP FIORI)
Multichannel sales analytics dashboards use SAP Fiori technology to provide category managers with real-time insight to sales activities across multiple sales channels.

Result

Multichannel sales data and KPIs are made available using SAP HANA views included in SAP HANA content for SAP Customer Activity Repository.

3.7 Enabling Demand Data Foundation and Creating Demand Forecast

You must enable Demand Data Foundation (DDF) to support consuming applications of SAP Customer Activity Repository and to create a demand forecast with Unified Demand Forecast (UDF). For more information about the DDF and UDF modules in SAP Customer Activity Repository, see SAP Help Portal at [https://help.sap.com/viewer/p/CARAB->>><Version>>>Application Help > SAP Customer Activity Repository > Demand Data Foundation >](https://help.sap.com/viewer/p/CARAB->>><Version>>>Application%20Help%20SAP%20Customer%20Activity%20Repository%20Demand%20Data%20Foundation%20and%20Unified%20Demand%20Forecast) and [Unified Demand Forecast](#).

The UDF demand forecast can serve as the basis for various cross-industry planning and automation use cases. UDF also provides insights into shopper behavior, enabling retailers to perform predictive analytics.

The demand forecast is generated in two steps:

1. **Demand modeling** is the process of finding the values for the parameters of a defined statistical model to explain the historical demand. The parameters of this demand model typically describe the effects of demand influencing factors (DIFs) in the past. The parameter values can then be used to predict the effects of similar DIF occurrences in the future, a process referred to as demand forecasting.
2. **Demand forecasting** predicts the demand for a particular product or group of products, in a particular location, for a given scenario (for example, promotion, sales channel), for a specific time period in the future (forecast horizon). Any aggregation of demand forecasts across products, locations, scenarios, or time is also a demand forecast.

The demand forecast uses the following master data:

- Location
- Location hierarchy
- Product
- Product hierarchy
- Product location combination
- Offer (optional)
- User DIF (optional)

The demand forecast uses the following organizational data:

- Sales organization
- Distribution channel
- Distribution chain
- Order channel

The demand forecast can use the following transaction data (time series):

- Point-of-sale (POS) data from SAP Business Warehouse (SAP BW) or from an external application
- Consumption data from an external application
- Syndicated data obtained from an external provider (sales data commonly aggregated to a weekly level and locations).

Note

For more information on the different master data objects and time series, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> > <Version> > Application Help > SAP Customer Activity Repository > Demand Data Foundation > Data Management >.

Business Process Steps

This business process runs as follows:

1. Send master data (SAP ERP)
SAP ERP prepares and sends the master data through a Remote Function Call (RFC) by using the data replication framework (DRF, transaction **DRFOUT**).

You have the following outbound implementations:

Sequence	Replication Mode	SAP ERP Outbound Implementation	SAP ERP Description	DDF Inbound Interface
1	Initialization	EMCH	Material Group Hierarchy	/DMF/ MDIF_PROD_HIER_INBOUND Product Hierarchy
2	Initialization, Change, and Manual	SEASON	Season	/DMF/ MDIF_SEASON_INBOUND Season
3	Initialization, Change, and Manual	EMAT	Material	/DMF/ MDIF_PRODUCT_INBOUND Product
4	Initialization, Change, and Manual	PPLT	Plant	/DMF/ MDIF_LOCATION_INBOUND Location
5	Initialization, Change, and Manual	EMPL	Material and Plant	/DMF/ MDIF_PROD_LOC_INBOUND Product Location
6	Change	PSPR	Sales Price	/DMF/ MDIF_PROD_LOC_INBOUND Product Location
7	Initialization, Change, and Manual	PCON	Consumption	/DMF/ TS_GENERIC_INBOUND Generic
8	Initialization, Change, and Manual	PCUS	Customer	/DMF/ MDIF_LOCATION_INBOUND Customer

Sequence	Replication Mode	SAP ERP Outbound Implementation	SAP ERP Description	DDF Inbound Interface
9	Initialization, Change, and Manual	PINV	Inventory	/DMF/ OPIF_INVENTORY_INBOUND Inventory
10	Change	PMAP	Moving Average Price	/DMF/ MDIF_PROD_LOC_INBOUND Product Location
11	Initialization, Change, and Manual	PSOS	Source of Supply	/DMF/ MDIF_LANE_INBOUND Transportation Lane
12	Initialization, Change, and Manual	PVEN	Vendor	/DMF/ MDIF_LOCATION_INBOUND Location
13	Initialization, Change, and Manual	PBBY	ERP Bonus Buy Transferred as Offer	/DMF/ OPIF_OFFER_INBOUND Offer
14	Initialization, Change, and Manual	POFF	ERP Promotion Transferred as Offer	/DMF/ OPIF_OFFER_INBOUND Offer
15	Initialization	PPHY_CLASS	Plant Hierarchy and Group from Classification System	/DMF/ MDIF_LOC_HIER_INBOUND Location Hierarchy
16	Initialization	PAHY	Article Hierarchy	/DMF/ MDIF_PROD_HIER_INBOUND Product Hierarchy

Sequence	Replication Mode	SAP ERP Outbound Implementation	SAP ERP Description	DDF Inbound Interface
17	Initialization	PPHY	Plant Hierarchy	/DMF/ MDIF_LOC_HIER_INBOUND Location Hierarchy
18	Initialization, Change, and Manual	PMCS	Material and Plant (Wholesale)	/DMF/ MDIF_PROD_LOC_INBOUND Customer Location/Product
19	Initialization, Change, and Manual	PWEB	Documents (Sales Order/Shipment/Billing)	/DMF/ OPIF_DOCUMENT_INBOUND
20	Initialization, Change, and Manual	PURCH_ORDR	Purchase Order	/DMF/ OPIF_PURCH_ORDR_INBOUND Purchase Order /DMF/ OPIF_CONFIRMATION_INBOUND Confirmation

Note

For more information about the ERP outbound processes, see the *Configuring Data Replication from SAP ERP to DDF* section of the *SAP Customer Activity Repository Administration Guide*.

For more information about the DDF inbound interfaces, see <https://help.sap.com/viewer/p/CARAB>

► <Version> ► *Application Help* ► *SAP Customer Activity Repository* ► *Demand Data Foundation* ► *Integration Information* ►

When replicating the data, the system automatically generates data replication logs, which you can then evaluate. You can access this option via *SAP Easy Access SAP Retail* (transaction **w10T**) under ► *Logistics* ► *Retailing* ► *Distributed Retailing* ► *Merchandise Lifecycle Optimization* ► *Outbound* ► *Analyze Log for Outbound Implementations (DRFLOG)* ►.

2. Receive master data (DDF)

DDF can receive master data from the following:

- Multiple SAP ERP applications
- Non-SAP applications

By default, the data is stored in the DDF staging tables. From there, you transfer the data to the production tables by using one of the following options:

- The *Monitor Imports* function
You use this function to transfer data from the staging tables to the production tables, review erroneous records, delete erroneous records, and clean up the staging tables. Note that you correct the erroneous records in the source application, and then you send the data again. For more information about this function, see <https://help.sap.com/viewer/p/CARAB> >> <Version> > [Application Help](#) > [SAP Customer Activity Repository](#) > [Demand Data Foundation](#) > [General Services](#) > [Monitor Imports](#) >.
- The *Process Inbound Staging Tables* function
For more information, see <https://help.sap.com/viewer/p/CARAB> >> <Version> > [Application Help](#) > [SAP Customer Activity Repository](#) > [Demand Data Foundation](#) > [General Services](#) > [Monitor Imports](#) > [Process Inbound Staging Tables](#) >.
- The `/DMF/PROCESS_STAGING_TABLES` report
For more information, see the accompanying system documentation (transaction **SE38**).

i Note

You can choose to bypass the staging tables in Customizing under >> [Cross-Application Components](#) > [Demand Data Foundation](#) > [Basic Settings](#) > [Integration](#) > [Define Import Settings](#) >. For more information, see the Customizing activity documentation (transaction **SPRO**).

DDF inbound process performs validation checks before inserting the data into the production tables.

For more information about how the data from external applications is processed, see <https://help.sap.com/viewer/p/CARAB> >> <Version> > [Application Help](#) > [SAP Customer Activity Repository](#) > [Demand Data Foundation](#) > [Integration Information](#) > [Inbound Processing](#) >.

3. Define sales history (DDF)
For more information on how to define the sales history, see section *Integrating Historical Demand Data* in .
4. Provide SAP Planning for Retail information (SAP BW)
This step is optional. It is currently used only by SAP Assortment Planning or SAP Merchandise Planning to compare the planned assortment figures to the open-to-buy (OTB).
For more information about the standard SAP BW InfoProvider, see https://help.sap.com/viewer/p/BI_CONTENT >> <Version> > [Application Help/SAP Library](#) > [BI Content](#) > [Industry Solutions](#) > [Trading Industries](#) > [Retail Trade](#) > [Merchandise and Assortment Planning](#) > [Retail Planning](#) > [MultiProvider](#) > [Merchandise Retail Plan](#) >.
5. Receive SAP Planning for Retail information (DDF)
This step is optional. It is currently used only by SAP Assortment Planning to compare the planned assortment figures to the open-to-buy (OTB).
Run report `/DMF/BI_IF_MERCH_PLAN` (transaction **SE38**) to receive the SAP Planning for Retail information from SAP Business Warehouse (SAP BW) to DDF. You can run this report as a scheduled background job (transaction **SM36**).

i Note

- Provide the required settings in the Customizing activities *Define SAP BW Application for Merchandise Planning* and *Define Field Mapping for Merchandise Planning* under >> [Cross-Application Components](#) > [Assortment Planning](#) > [Imported Demand Data Foundation Settings](#) > [Integration](#) >.

Alternatively, provide a custom implementation for the *BAdI: Read Merchandise Planning* Business Add-In.

- If you use the standard settings in the *Define Field Mapping for Merchandise Planning* Customizing activity, that is, you are importing the OTB from the `ORP_MP12` MultiProvider, you must specify **MMF** (*Finalized Merchandise Version*) in the *Merchandise Plan Version* field of the report.

6. Schedule demand model (UDF)

You can schedule the system to create the demand model with the following options:

- Model by hierarchy
With this option, you can select a node to include all products and locations assigned to that hierarchy branch.
- Model by product location
With this option, you can specify a list of one or more products and one or more locations.

For more information, see <https://help.sap.com/viewer/p/CARAB> ► *Version* ► *Application Help* ► *SAP Customer Activity Repository* ► *Unified Demand Forecast* ► *General Services* ► *Schedule Model and Forecast* ►.

7. Schedule demand forecast (UDF)

You can schedule the system to create the demand forecast with the following options:

- Forecast by hierarchy
With this option, you can select a node to include all products and locations assigned to that hierarchy branch.
- Forecast by product location
With this option, you can specify a list of one or more products and one or more locations.

For more information, see <https://help.sap.com/viewer/p/CARAB> ► *Version* ► *Application Help* ► *SAP Customer Activity Repository* ► *Unified Demand Forecast* ► *General Services* ► *Schedule Model and Forecast* ►.

Result

The system generates the demand forecast, which is then saved in the database.

⚠ Caution

If you are using workbooks in SAP Assortment Planning or SAP Merchandise Planning, only the following standard characters are valid in values for characteristics (in the sense of BI Content objects): `!"%&'()*+,-./:;<=>?_0123456789ABCDEFGHIJKLMNPOQRSTUVWXYZ`.

Values of characteristics that only consist of the character `#` or that begin with `!` are not valid.

For more information about allowed characters in SAP BW systems, see SAP note [173241](https://support.sap.com/en/notes/173241.html) ►.

3.8 Monitoring On-Shelf Availability

You can use this business process to perform monitoring or analysis:

- Perform monitoring to retrieve a regularly updated list of product locations that are likely out-of-shelf at a specific point in time in one or more stores. You can use this information to trigger follow-on actions, such as replenishment from the backroom, correction of inventory information, and tidying of the shelf to allow for an unobstructed view of the product.
- Perform an analysis to determine which product locations had on-shelf availability issues at what times in the past. This makes you aware of the on-shelf availability situation and allows you to define appropriate follow-up activities to improve the situations where necessary.

By detecting product locations that are likely out-of-shelf using a statistical algorithm based on POS transaction data in SAP Customer Activity Repository, you can determine possible out-of-shelf situations even if you have no separate system inventory for the shelf or the figures are not correct due to spoilage, theft or misplacement.

Process

1. Run the intra-week pattern analyzer.
The intra-week pattern models the regular intra-week and intra-day sales fluctuations of single items or categories. Sales rates are aggregated by product location, store, and store sub-department.
2. Calculate the estimation model parameters.
This calculation models the waiting time between two sales and determines the effect of the trend and sales influencing factors.
3. Perform monitoring or analysis.
 - Perform monitoring to detect and address operational out-of-shelf situations.
 - Perform an analysis to create calculation results for reporting
4. Evaluate the results.
The results of the monitoring are stored in table `/OSA/MONITORING`. Each record in the table represents an expected out-of-shelf situation. This situation is amended by the probability the item is considered to be out-of-shelf, the estimated lost transactions/lost sales/lost revenue (if activated in the monitoring step) and further attributes.
The results of the analysis are stored in table `/OSA/MON_ANA`. This table then contains the transaction intervals that are probably out-of-shelf situations.

Result

For monitoring, the result of this business process is a regularly updated list of product locations that are likely to be out-of-shelf.

For an analysis, the result of this business process is a list of transaction intervals in which the product location was probably out-of-shelf.

More Information

For more information, see <https://help.sap.com/viewer/p/CARAB> |> <Version> |> *Application Help* |> *SAP Customer Activity Repository* |> *On-Shelf Availability* |>.

4 Configuration

Configure different modules of SAP Customer Activity Repository as required for your scenario.

[Configure Demand Data Foundation \(DDF\) \[page 136\]](#)

Set up and enable the DDF module in SAP Customer Activity Repository for creating demand forecasts with Unified Demand Forecast (UDF) and supporting the consuming applications. In this section, you also find a list of the Customizing activities for both DDF and UDF.

[Set Up and Configure DDF Services \[page 174\]](#)

Set up and configure services that the Demand Data Foundation module in SAP Customer Activity Repository provides for different scenarios and consuming applications.

[Configure Unified Demand Forecast \(UDF\) \[page 186\]](#)

Configure the UDF module in SAP Customer Activity Repository to adjust demand modeling and forecasting for your scenario. You can select from multiple UDF features, optimize performance for your scenario, and configure parameters for modeling and for forecasting. Additionally, you can set up the demand planning apps.

[Optimize OAA Performance \[page 254\]](#)

Get recommendations on how to optimize OAA performance with regard to availability calculation and sourcing, for example by checking the setup of the server group used for the parallelized ATP run, by deleting outdated data, or by putting additional load on the system where absolutely required only.

[Set Up SAP Fiori Apps for SAP Customer Activity Repository \[page 257\]](#)

SAP Customer Activity Repository includes multiple apps that support different scenarios and consuming applications. For a full list of these apps, see the **SAP Fiori for SAP Customer Activity Repository** section of the application help for SAP Customer Activity Repository.

4.1 Configure Demand Data Foundation (DDF)

Set up and enable the DDF module in SAP Customer Activity Repository for creating demand forecasts with Unified Demand Forecast (UDF) and supporting the consuming applications. In this section, you also find a list of the Customizing activities for both DDF and UDF.

i Note

This section provides additional information for the DDF Customizing activities, which you can find in the [SAP Customizing Implementation Guide](#) (transaction **SPRO**) under **► Cross-Application Components ► Demand Data Foundation ►**.

Prerequisites

- You have ensured that the tasks relevant for SAP Customer Activity Repository in the *Common Installation Guide* (for new installations) or the *Common Upgrade Guide* (for upgrade scenarios) have been performed. You can find both guides on SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> under **▮ <Version>** **▸ Installation and Upgrade ▾**.
- You have ensured that the source master data system (SAP Retail, SAP S/4HANA) has been customized to send master data and transactional data to DDF. The data is sent/replicated to DDF by using the data replication framework (DRF, transaction **DRFOUT**).

Use of OData Services

OData services have been included as of SAP Customer Activity Repository applications bundle 4.0. If you choose to use them to load master data, instead of using the data replication framework (DRF), you must activate the services and have a user-defined job stream.

For information on what OData services are available for DDF and how to activate them, see section *Activate OData Services* of the *Common Installation Guide*.

For technical details and entity descriptions for each service, see <https://help.sap.com/viewer/p/CARAB> under **▮ <Version>** **▸ Application Help ▸ SAP Customer Activity Repository ▸ Demand Data Foundation ▸ OData Services ▾**.

Procedure

1. If you wish to use the DDF standard screens, execute transaction **SICF** and ensure that the services under **▮ Service ▸ default_host ▸ sap ▸ bc ▸ webdynpro ▸ dmf ▾** are activated. If a service is not active, activate it.
2. Define the calendar in Customizing under **▮ SAP NetWeaver ▸ Basic Settings ▸ Maintain Calendar ▾**.

i Note

- If you are integrating DDF with SAP Retail, ensure that the factory calendars between DDF and SAP Retail are synchronized. If you are not integrating DDF with SAP Retail, you must manually create your factory calendars and ensure that they are assigned to their respective locations for import.
- If you are integrating DDF with SAP Business Warehouse (SAP BW), ensure that the DDF calendar is synchronized with the SAP BW fiscal year variant.

3. Configure event type linkages.
 1. Execute transaction **SWETYPV** and select the *Linkage Activated* field for all object types that start with **/DMF/CL**. After you have selected the field, the report runs automatically for the following:
 - Created product group and location group
 - Imported product hierarchy and location hierarchy

- Execute transaction SWETYPV and select the *Enable Event Queue* field for the following object types:

Objects Types for Enable Event Queue

Object Category	Object Type	Event	Receiver Type
ABAP Class	/DMF/CL_LOCATION	LOCATION_CREATED	CLASS
ABAP Class	/DMF/CL_LOCATION	LOCATION_UPDATED	CLASS
ABAP Class	/DMF/ CL_LOCATION_HIER	CREATE_LOC_HIER	/DMF/ CL_FLATTENER_TRIGGER
ABAP Class	/DMF/CL_PRODUCT_HIER	CREATE_PROD_HIER	/DMF/ CL_FLATTENER_TRIGGER

- Define number ranges for DDF.

Define the number ranges in Customizing for *Number Range Object Maintenance* under [Cross-Application Components](#) > [General Application Functions](#) > [Records and Case Management](#) > [Basic Settings](#) > [Unique Indicator](#) > [Maintain Number Ranges](#).

The following table shows the relevant number ranges for DDF:

Number Ranges for DDF

Number Range Object	Description	Number	Range From	Range To
/DMF/OFRID	External offer identifier	01	000000001	999999999
/DMF/LHR10	Location hierarchy identifier	01	000000001	000020000
		02	000020001	999999999
/DMF/PHR10	Product hierarchy identifier	01 (imported hierarchies)	000000001	000020000
		02 (manually created hierarchies)	000020001	999999999
/DMF/LBJID	Controller job identifier	01	00000001	99999999
/DMF/MD_M2	Background job identifier for the mass maintenance of master data	01	00001	99999
/DMF/MD_MM	Error job identifier for the mass maintenance of master data	01	00001	99999

Number Range Object	Description	Number	Range From	Range To
/DMF/VNDDL	Vendor deal identifier	01	0000000001	9999999999
/DMF/PHPID	Placeholder product identifier	01	00000000000001	99999999999999
<div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin: 5px 0;"> <p>Note</p> <p>This range must not conflict with product numbers.</p> </div>				
/DMF/TSEQ	Time stamp identifier	01	0000000001	9999999999
/DMF/OPJOB	Scheduler job identifier	01	0000000001	9999999999
/DMF/TSKID	Offer financials identifier	01	0000000001	9999999999
/DMF/CLSID	Location cluster identifier	01	0000000001	9999999999

5. Define mandatory SAP NetWeaver and general Customizing activities for all consuming applications.

Customizing Activities for NetWeaver/General Area

Configuration Object	Customizing Activity
/IWBEP/BOR_EVENT	▶ SAP NetWeaver > Gateway Service Enablement > Backend OData Channel > Backend Event Publisher Administration > Event Type Linkages
OBIL-ALE-11	▶ SAP NetWeaver > Application Server > IDoc Interface/ Application Link Enabling (ALE) > Modeling and Implementing Business Processes > Configure Predefined ALE Business Processes > Cross-Application Business Processes > Central User Administration > ALE Mandatory Activities for Central User Administration > Define Logical System

Configuration Object	Customizing Activity
OBIL-ALE-12	SAP NetWeaver > Application Server > IDoc Interface/ Application Link Enabling (ALE) > Modeling and Implementing Business Processes > Configure Predefined ALE Business Processes > Cross-Application Business Processes > Central User Administration > ALE Mandatory Activities for Central User Administration > Assign Logical System to Client >
OALE_RFCDEST_SM59	SAP NetWeaver > Application Server > IDoc Interface/ Application Link Enabling (ALE) > Modeling and Implementing Business Processes > Configure Predefined ALE Business Processes > Cross-Application Business Processes > Central User Administration > ALE Mandatory Activities for Central User Administration > Create RFC Connections >
_RMPS_REF_SNRO	Cross-Application Components > General Application Functions > Records and Case Management > Basic Settings > Unique Indicator > Maintain Number Ranges >

6. Review all Customizing activities and Business Add-Ins (BADIs) under [Cross-Application Components](#) > [Demand Data Foundation](#) > that are relevant and/or mandatory for your consuming application. Review the activities and read the accompanying documentation to determine how the activity fits your scenario. If the activity is applicable for an application, this is indicated by **X** (mandatory) or **(X)** (optional) in the table below.

DDF Customizing Activities and Their Relevance for Consuming Applications

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/LOG_SYS	Cross-Application Components > Demand Data Foundation > Basic Settings > Define Logical Systems >	X	X	X	X
/DMF/V_C_MD_DFLT	Cross-Application Components > Demand Data Foundation > Basic Settings > Define Default Values >	X	X	-	X
/DMF/BUS_WEEK	Cross-Application Components > Demand Data Foundation > Basic Settings > Define Business Week >	X	X	X	-

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/SKIPSTAG	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Integration ▶ Define Import Settings ▶	(X)	(X)	(X)	(X)
/DMF/ V_BI_SYSPLN	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Integration ▶ Define SAP BW Application for Merchandise Planning ▶	X	X	-	-
/DMF/ V_MAP_BI_PL	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Integration ▶ Define Field Mapping for Merchandise Planning ▶	X	X	-	-
/DMF/ SYS_MAP_GEN	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Integration ▶ Sending System and Master Data System Coupling ▶	X	X	X	X
/DMF/BI_TO_MD	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Integration ▶ BI and Master Data System Coupling ▶	(X)	(X)	(X)	(X)
/DMF/PLAN- NED_DATA_DEF	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Integration ▶ Enhancements Using Business Add-Ins ▶ BAdI: Read Merchandise Planning ▶	(X)	(X)	-	-
/DMF/ PROP_DESRIP- TIONS_DEF	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Integration ▶ Enhancements Using Business Add-Ins ▶ BAdI: Description of Replicated Properties ▶	(X)	(X)	-	-

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/EM_01	<ul style="list-style-type: none"> ▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Exception Management ▶ Maintain Configuration Data for High Level Exceptions ▶ 	X	X	X	X
/DMF/EM_02	<ul style="list-style-type: none"> ▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Exception Management ▶ Maintain Configuration Data for Low Level Exceptions ▶ 	X	X	X	-
/DMF/MSGCUST	<ul style="list-style-type: none"> ▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Exception Management ▶ Define Customer-Specific Replacement Messages ▶ 	(X)	(X)	(X)	(X)
/DMF/MSGSTATUS	<ul style="list-style-type: none"> ▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Exception Management ▶ Define Customizable Message Status ▶ 	(X)	(X)	(X)	(X)
/DMF/EM_CON-TEXT_CHART_SWF_FIL	<ul style="list-style-type: none"> ▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Exception Management ▶ BADl: Exception Monitor Context Chart SWF File Replacement ▶ 	(X)	(X)	(X)	(X)
/DMF/V_WUF_CUST	<ul style="list-style-type: none"> ▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Purging ▶ Define Purge Settings ▶ 	X		X	X

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/ WUF_MOD- IFY_OBJ_DELE- TION1	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Purging ▶ Enhancements Using Business Add-Ins ▶ BAdI: Change Object List Before Actual Deletion Starts ▶	X		X	X
/DMF/ORG_SO_V	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Organizational Data ▶ Maintain Sales Organization ▶	X	X	X	X
/DMF/ORG_CH_V	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Organizational Data ▶ Maintain Distribution ChannelOrganization ▶	X	X	X	X
/DMF/ ORG_DISCH_V	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Organizational Data ▶ Maintain Distribution Chain ▶	X	X	X	X
/DMF/ORG_PO_V	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Organizational Data ▶ Maintain Purchasing Organization ▶	X	X	X	X
/DMF/ORG_PG_V	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Organizational Data ▶ Maintain Purchasing Group ▶	X	X	X	X

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/ ORG_DIST_CH_AU TH_CHECK	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Organizational Data ▶ BAI: Distribution Chain-Based Authority Check ▶	X	X	X	X
/DMF/ AMOUNT_ROUNDING_DEF	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶ Global Enhancements Using Business Add-Ins ▶ BAI: Rounding of Currency Amount Value ▶	(X)	(X)	(X)	(X)
/DMF/MD_03	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Maintain Master Data Field Attributes ▶	(X)	(X)	(X)	(X)
/DMF/ MIME_PATH	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Image ▶ Define Path to MIME Objects ▶	(X)	(X)	(X)	(X)
/DMF/ IMAGE_SEARCH	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Image ▶ Maintain Image Search Parameters ▶	(X)		X	(X)
/DMF/MAIN- TAIN_IMAGE	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Image ▶ BAI: Maintain Promotion Specific Verifications for Images ▶	-	-	(X)	

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/LOCATION_EXTENSION_CUST	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Location ▶ Enhancements Using Business Add-Ins ▶ BAdI: Enhance Header Data for Location ▶	(X)	(X)	(X)	(X)
/DMF/CUSTOMER_LOCATION_VALIDATE	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Location ▶ Enhancements Using Business Add-Ins ▶ BAdI: Validation of Extensions for Location ▶	(X)	(X)	(X)	(X)
/DMF/CUSTOMER_PRODUCT_VALIDATE	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Product ▶ Enhancements Using Business Add-Ins ▶ BAdI: Validation of Extensions for Product ▶	(X)	(X)	(X)	(X)
/DMF/IF_PRODUCT_QUERY	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Product ▶ Enhancements Using Business Add-Ins ▶ BAdI: Addition of Parameters to the Product Query ▶	(X)	(X)	(X)	(X)
See activity path using SPRO	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Product Hierarchy ▶ Enhancements Using Business Add-Ins ▶	(X)	(X)	(X)	(X)
See activity path using SPRO	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Product Location ▶ Enhancements Using Business Add-Ins ▶	(X)	(X)	(X)	(X)

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
See activity path using SPRO	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Offer ▶ Enhancements Using Business Add-Ins ▶		(X)	(X)	-
/DMF/ V_WS_CONF	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Sales Orders ▶ Maintain Document Types ▶	(X)	X	(X)	-
/DMF/ V_WS_DCTYP	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Sales Orders ▶ Maintain Discount Condition Types ▶	(X)	X	(X)	-
/DMF/ V_WS_RCODE	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Sales Orders ▶ Maintain Reason Codes for Rejection ▶	(X)	X	(X)	-
/DMF/ V_WS_SO_SCH	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Sales Orders ▶ Maintain Schedule Line Category ▶	(X)	X	(X)	
/DMF/ V_TS_CONF	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Time Series ▶ Define Times Series For Key Figure Configuration ▶	-	-	-	-
/DMF/NR_TSID	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Time Series ▶ Maintain Number Range for Time Series ▶	X	X	X	(X)

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/BI_IF_02	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Time Series ▶ Initial Transfer Settings ▶ Interface for Initial Data from BI to Time Series Activation ▶	(X)	(X)	(X)	(X)
/DMF/BI_IF_01	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Time Series ▶ Initial Transfer Settings ▶ Interface for Initial Data from BI to Time Series Profile ▶	(X)	(X)	(X)	(X)
See activity path using SPRO for more entries.	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Time Series ▶ Initial Transfer Settings ▶ Enhancements Using Business Add-Ins ▶	(X)	(X)		(X)
/DMF/SALES_HIST_PURCH_PRC See activity path using SPRO for more entries.	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Time Series ▶ Enhancements Using Business Add-Ins ▶ BAdI: Determination of Purchase Price for Sales History Record ▶ Interface for Initial Data from BI to Time Series Profile ▶	(X)	(X)	-	-
See activity path using SPRO for more entries.	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Imported Data ▶ Transportation Lane ▶ Enhancements Using Business Add-Ins ▶	(X)	(X)	-	(X)
/DMF/MD_04	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Maintain General Master Data Attributes ▶	(X)	-	-	(X)

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/ WHATIF_SRC	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Define Time Series Source ▶	(X)	(X)	X	
/DMF/NR_MD_M2	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Mass Maintenance ▶ Maintain Number Ranges for Batch Jobs ▶	-	-	X	(X)
/DMF/ NR_MD_MM	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Mass Maintenance ▶ Maintain Number Ranges for Error Recovery ▶	-	-	(X)	(X)
/DMF/PLN_CFG	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Planning Configuration ▶ Maintain Number Range for Planning Configuration ▶	X	X	-	-
/DMF/PRM_CFG	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Planning Configuration ▶ Maintain Number Range for Parameter Configuration ▶	X	-	-	-

Not
e
Version
2.0
FP02
and
later

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/ MPR_READ_KPI_DATA	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Planning Configuration ▶ Enhancements Using Business Add-Ins ▶ BAdI: Read Merchandise Planning KPI Data ▶	X	-	-	-
/DMF/ MPR_DSO_INIT	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Planning Configuration ▶ Enhancements Using Business Add-Ins ▶ BAdI: Initialize BW DSO for Product and Market Hierarchy CR ▶	-	X	-	-
/DMF/ VC_ATTRIBUTE	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Attributes ▶ Maintain Attributes ▶	X	(X)	-	X
/DMF/ V_ATR_FN_TP	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Attributes ▶ Define Function Types ▶	X	(X)	-	X
/DMF/NR_ATR	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Attributes ▶ Maintain Number Range for Attributes ▶	X	(X)	- a	X
/DMF/ NR_ATR_VAL	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Attributes ▶ Maintain Number Range for Attribute Values ▶	X	(X)		X

is Not
e
Version
2.0
FP02
and
later

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
See activity path using <code>SPRO</code> for more entries.	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Attributes ▶ Enhancements Using Business Add-Ins ▶	(X)	(X)	(X)	-
/DMF/V_INV_HIST	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Inventory ▶ Define Historical Inventory Information ▶	X	X	-	-
/DMF/V_INV_HIST	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Inventory ▶ BAdI: Definition for Season Determination ▶	X	X	-	-
/DMF/NR_LHR	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Location Hierarchy ▶ Maintain Number Ranges for Location Hierarchy ▶	X	-	X	X
See activity path using <code>SPRO</code> for more entries.	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Location Hierarchy ▶ Enhancements Using Business Add-Ins ▶	(X)	-	-	-
/DMF/PROC_PUR	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Define Processing Purpose ▶	-	-	(X)	-
/DMF/V_FIN_CUST	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Specify Parameters for Offer Financials ▶	-	-	X	-

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/ OFR_DELETE	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Offer Delete Options ▶	-	-	X	-
/DMF/NR_OFR	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Maintain Number Range for Offer ▶	-	-	X	-
/DMF/ OFR_PUR_PRC	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Maintain Indicators for Offer Calculations ▶	-	-	X	-
/DMF/ PROMO_TACTIC	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Maintain Promotion Specific Tactics ▶	-	-	X	-
/DMF/ V_OFR_TRMSG	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Define Term Style Groups ▶	-	-	(X)	-
/DMF/ OTS_DEF_VCL	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Define Term Style Configuration ▶	-	-	X	-
/DMF/ IMPL_OFR_TACTIC_SWITCH	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Implementation: Activate Time Dependent Tactic ▶	-	-	(X)	-

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/ IMPL_FIORI_PMR_SW	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Implementation: Fiori PMR Offers Switch ▶	-	-	(X)	-
/DMF/ V_CUAN_CONN	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Marketing Interface ▶ Maintain Export Connection ▶	-	-	(X)	-
/DMF/ V_MKT_AREA	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Marketing Interface ▶ Maintain Marketing Area ▶	-	-	(X)	-
/DMF/ IMPL_OFR_TGT_GRP_SW	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Implementation: Activate Offer Target Group ▶	-	-	(X)	-
/DMF/ BADI_TGT_GRP_DATA	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ BAdI: Target Group Data Accessp ▶	-	-	-	-
/DMF/V_INCENT	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Maintain Incentives ▶	-	-	X	-
/DMF/INT_01	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Offer Export to the Execution System ▶ Maintain ERP Promotion Type IDs ▶	-	-	X	-

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/ V_OFR_LEAD	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Offer Export to the Execution System ▶ Maintain Offer Lead Times ▶	-	-	X	-
/DMF/ META_ATTR	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Offer Export to the Execution System ▶ Maintain Metadata Attributes by Class ▶	-	-	X	-
/DMF/OFR_GRP	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Offer Export to the Execution System ▶ Maintain ERP Outbound Metadata Attributes ▶	-	-	X	-
/DMF/ BI_OFFER_PLUGIN	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶ Offer Export to the Reporting System ▶ Implementation: Activate Track Offer Changes ▶	-	-	X	-
/DMF/ V_PHP_BASIC	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Placeholder Products ▶ Maintain Basic Settings ▶	X	-	X	-
/DMF/NR_PHP	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Placeholder Products ▶ Maintain Number Range for Placeholder Products ▶	X	-	X	-

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/ V_PHP_CRT	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Placeholder Products ▶ Define Fields for Placeholder Product Creation ▶	-	-	X	-
/DMF/ V_PHP_MNT	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Placeholder Products ▶ Define Fields for Placeholder Product Maintenance ▶	-	-	X	-
/DMF/VC_PHP	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Placeholder Products ▶ Maintain ERP Transfer Settings ▶	-	-	(X)	-
/DMF/NR_PHR	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Product Hierarchy ▶ Maintain Number Range for Product Hierarchy ▶	X	-	X	X
/DMF/ PRHR_CUST	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Product Hierarchy ▶ Control Parameters for Product Hierarchies ▶	(X)	-	(X)	(X)
/DMF/NR_VNDDL	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Vendor Fund ▶ Maintain Number Range for Vendor Deal ▶	-	-	X	-

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/ FUND_TYPE	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Vendor Fund ▶ Maintain Fund Type by Sales Organization ▶	-	-	X	-
/DMF/OFFER_IMG	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Vendor Fund ▶ Margin and Price Allocation for Fund Types ▶	-	-	X	-
/DMF/ IMPL_VF_EXPORT	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Vendor Fund ▶ Implementation: Activate Vendor Fund Export ▶	-	-	X	-
/DMF/ IMPL_VF_LATE	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Vendor Fund ▶ Implementation: Activating Late Change Function in VF ▶	-	-	X	-
/DMF/ IMPL_VF_PG	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Vendor Fund ▶ Implementation: Product Group Usage in Vendor Funds ▶	-	-	X	-
/DMF/ PROMO_CHARS	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Content Template ▶ Maintain Special Characters ▶	-	-	X	-
/DMF/ OFR_PRIORITY	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Content Template ▶ Maintain Offer Priority ▶	-	-	X	-

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
DMF/ V_C_MD_HRL	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Location Clustering ▶ Location Clustering Settings ▶	X	(X)	-	X
/DMF/CLSTS_NR	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Location Clustering ▶ Maintain Number Range for Location Cluster Sets ▶	X	(X)	-	X
/DMF/BP_SUB_T	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Location ▶ Maintain Text of BP Role ▶			X *wholesale offers	X
/DMF/NR_MDID	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Assortment Modules ▶ Maintain Number Range for Assortment Modules ▶	X	-	-	-
/DMF/ V_DCC_CAPPL *All consuming applications of SAP Customer Activity Repository are delivered	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Distribution Curve Configuration ▶ Define Consuming Applications for Distribution Curves ▶	(X)	(X)	(X)	X
/DMF/ V_DCC_UTP	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Distribution Curve Configuration ▶ Define Usage Types for Distribution Curves ▶	(X)	(X)	(X)	X

Configuration Object	Customizing Activity	SAP Assortment Planning	SAP Merchandise Planning	SAP Promotion Management	SAP Allocation Management
/DMF/ V_DCC_UTPCA	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Distribution Curve Configuration ▶ Assign Consuming Applications to Usage Types ▶	(X)	(X)	(X)	X
/DMF/ V_DRAFT_ADM	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Distribution Curve Configuration ▶ Maintain Expiry and Reorganization Periods for Drafts ▶	(X)	(X)	(X)	X
/DMF/ BADI_TLOG_DATA_ACCESS	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Analytics ▶ BAdI: TLOG Data Access ▶	-	-	(X)	-
/DMF/V_BP_DPP	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Data Protection and Privacy ▶ Enable Business Partner ID Blocking ▶	(X)	(X)	(X)	(X)
/DMF/ BP_OB_NUM	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Data Protection and Privacy ▶ Maintain Number Range for Blocked ID ▶	(X)	(X)	(X)	(X)
/DMF/BP_BLOCK	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Data Protection and Privacy ▶ Enhancements Using Business Add-Ins ▶ BAdI: Block Business Partner ID ▶	(X)	(X)	(X)	(X)

7. The Customizing activities for modeling and forecasting are shipped with default settings. The activities are listed in the following table.

Customizing Activities for Modeling and Forecasting

Configuration Object	Customizing Activity
/DMF/V_DIAG_ID	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Modeling and Forecasting ▶ Define Diagnostic IDs ▶
DMF/V_UMD_CAT	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Modeling and Forecasting ▶ Define Model Categories ▶
/DMF/V_UMRP_MOD	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Modeling and Forecasting ▶ Assign Material Requirements Planning Types to Model Categories ▶
/DMF/V_MOD_MAP	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Modeling and Forecasting ▶ Assign Demand Model Definitions ▶
/DMF/V_UMD_CONFIG	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Modeling and Forecasting ▶ Define Modeling Control Settings ▶
/DMF/V_UFC_CONFIG	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Modeling and Forecasting ▶ Define Forecasting Control Settings ▶
/DMF/V_HPR_CTRL	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Modeling and Forecasting ▶ Configure Hierarchical Priors ▶
/DMF/V_FCQUALIDX	▶ Cross-Application Components ▶ Demand Data Foundation ▶ Modeling and Forecasting ▶ Define Categories for Forecast Confidence Index ▶

8. The consuming applications may be affected by settings available in the ▶ SAP NetWeaver Business Client ▶ Services ▶ menu. For more information, see the *General Services* section for DDF at <https://help.sap.com/viewer/p/CARAB> under ▶ <Version> ▶ Application Help ▶ SAP Customer Activity Repository ▶ Demand Data Foundation ▶.
- In particular, review your settings for the *Configure Load Balancing* service, which can have a considerable impact on performance. This is true for consuming applications (such as the what-if forecast generated for SAP Promotion Management) and for functionality within SAP Customer Activity Repository (such as modeling and forecasting with UDF).
9. (Optional) Partition large tables for forecasting scenarios. For recommendations and instructions, see [Partition Tables for UDF and DDF \[page 225\]](#).

4.1.1 Enable Time-Dependent Article Hierarchies (Optional)

Create SAP ERP article hierarchies with status *Active* and replicate them to the application server as product hierarchies. When used by the consuming application, time-dependent hierarchies are active during the defined validity period in the future.

Use

You must replicate time-dependent article hierarchies with a **full refresh**. For instance, if you add a new node or article to a node, do not run the data replication framework (DRF, transaction `DRFOUT`) as a delta activity (changed-only activity). If you do, the consuming application will only receive the new hierarchy information. For more information, see SAP Note [2264864](#).

If you wish to use a time-dependent article hierarchy, you must first create it in the source master data system. Flag the article assignment as main assignment so it can be replicated for the node.

Then activate the hierarchy in Customizing so that DDF can recognize it. Follow these steps:

Procedure

1. In Customizing (transaction `SPRO`), activate the time-dependent article hierarchy under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Data Maintenance* ► *Product Hierarchy* ► *Control Parameters for Product Hierarchies* ▾. For more information, see the Customizing activity documentation.

More Information

For information about replicating data to DDF, see the following information on SAP Help Portal at <https://help.sap.com/viewer/p/CARAB>:

- *SAP Customer Activity Repository Application Help*, section *Master Data Replication from SAP ERP to Demand Data Foundation*
- *SAP Customer Activity Repository Administration Guide*, section *Introduction to SAP Customer Activity Repository*

For information about Customizing for article hierarchies in the source master data system, see the activities under ► *Logistics - General* ► *Article Hierarchy* ▾.

4.1.2 Configure Data Replication from SAP ERP to DDF

Configure data replication using the data replication framework (DRF, transaction **DRFOUT**) to support the enabling of Demand Data Foundation (DDF).

Use

You use this procedure to support the enabling of DDF for different consuming applications and for demand forecasting with Unified Demand Forecast (UDF). For more information, see the business process.

Prerequisites

- You have successfully installed and implemented SAP Customer Activity Repository as described in the *Common Installation Guide* (for new installations) or the *Common Upgrade Guide* (for upgrade scenarios). You can find both guides on SAP Help Portal under <https://help.sap.com/viewer/p/CARAB> >> <Version> >> [Installation and Upgrade](#) >.
- You have ensured that the following actions have been performed in the SAP ERP application:
 - The user must have access to the following transaction codes: SPRO, MM43, SE11, SM59, and DRFIMG.
 - The user has been authorized to execute transaction **DRFOUT** (authorization object DRF_ADM).
 - If you are using SAP ECC, the following business functions have been activated:
 - ISR_APPL_OUTBOUND_DMF
 - ISR_RETAIL_OUTBOUND_DMF
 - The logical system has been defined in the Customizing activity [Define Logical System](#).
 - The remote function call (RFC) connection has been created (transaction **SM59**).
 - The business system has been defined in the Customizing activity [Define Technical Settings for Business System](#).
- ◦ You have ensured that the following actions have been performed in the DDF system:
 - The remote function call (RFC) connection has been created (transaction **SM59**).
 - The logical system has been defined in the Customizing activity [Define Logical System](#).

Procedure for SAP ERP System

1. Transport ISO codes to DDF. For more information about ISO codes, see SAP ERP Customizing under >> [SAP NetWeaver](#) > [Basic Settings](#) > [Check Units of Measurement](#) > [ISO Codes](#) > (T006I table).
2. Transport units of measurement to DDF. For more information about units of measurement, see SAP ERP Customizing under >> [SAP NetWeaver](#) > [Basic Settings](#) > [Check Units of Measurement](#) > [Units of Measurement](#) > (T006 table).
3. Define the calendar in Customizing under >> [SAP NetWeaver](#) > [Basic Settings](#) > [Maintain Calendar](#) >. Ensure that the factory calendars between DDF and SAP ERP are aligned.

4. Activate the *DRF BC Set for SAP Content* (CA_MDP_DRF_01) business configuration set (transaction **SCPR20**).
5. Select which business objects you want to transfer in Customizing under **Logistics - General** **Outbound** **Data Replication Framework**.

i Note

Verify that you have made the necessary settings to ensure that you only transfer the business objects that you need in your target system.

6. Replication models are a function of the SAP Master Data Governance. For more information see: SAP Help Portal for SAP Master Data Governance at https://help.sap.com/viewer/p/SAP_MASTER_DATA_GOVORNANCE **Application Help** **SAP Master Data Governance** **Working with SAP Master Data Governance** **Working with SAP MDG, Central Governance** **General Functions** **Data Replication**.

Define the custom settings for data replication (transaction **DRFITMG**).

- Define Technical Settings for Business Systems
Assign a business system, a logical system, and an RFC destination to initialize the data transfer. You can initialize only one defined business system. Ensure that you have **not selected** the *Disabled for Replication* field for the target business system.
Note that you can send data manually for the other business systems.

- Define Replication Models
The replication model defines how data is replicated between systems. It contains one outbound implementation for every business object that should be transferred to a target system. Each outbound implementation indicates the business object data that needs to be transmitted, the class that retrieves and sends the data and the communication channel (such as service operation or RFC) used for the transmission itself.
A sequence number assigned to the outbound implementation determines the order in which filters should be executed for a replication model. It indicates the sequence in which the outbound implementations are performed within a replication model.
A combination of a business object and a target system can only be assigned to one replication model. In this way it is ensured, that for a business object only a unique supply of data can be setup per target system.
The sequence in which the outbound implementations are performed within a replication model is indicated by the outbound implementation sequence. It determines the order in which filters should be executed for a replication model.

- Create an entry with the following information:

Replication Model	DDF
Description	Demand Data Foundation
Log Days	7
Active	Selected

- Assign outbound implementations.

Create an entry for each outbound implementation that you want to use as follows:

i Note

Sequencing ensures dependencies and filters

Outbound Implementation	SAP ERP Description	Sequence	Communication Channel
PMCH *	Material Group Hierarchy	1	Replication via RFC
SEASON	Seasons	2	Replication via RFC
PMAT *	Material	3	Replication via RFC
PPLT *	Plant	4	Replication via RFC
PMPL *	Material and Plant	5	Replication via RFC
PSPR *	Sales Price	6	Replication via RFC
PCON	Consumption	7	Replication via RFC
PCUS	Customer	8	Replication via RFC
PINV	Inventory	9	Replication via RFC
PMAF *	Moving Average Price	10	Replication via RFC
PSOS *	Source of Supply	11	Replication via RFC
PVEN	Vendor	12	Replication via RFC
PBBY	ERP Bonus Buy Transferred as Offer	13	Replication via RFC
POFF	ERP Promotion Transferred as Offer	14	Replication via RFC
PPHY_CLASS	Plant Hierarchy and Group from Classification System	15	Replication via RFC
PAHY *	Article Hierarchy	16	Replication via RFC
PPHY *	Plant Hierarchy	17	Replication via RFC

Outbound Implementation	SAP ERP Description	Sequence	Communication Channel
* = mandatory			
PMCS	Material and Plant (Wholesale)	18	Replication via RFC
PWEB	Documents (Sales Order/Shipment/Billing)	19	Replication via RFC
PURCH_ORDR	Purchase Order	20	Replication via RFC

- Assign a target system for the replication model (outbound implementation). Each outbound implementation that you want to use must have an assigned business system.
- Assign the language. Note that if you leave this field empty, all languages are replicated.
- Activate your replication model.

7. Define filters for initialization (transaction **DRFF**).

⚠ Caution

Ensure that you have values assigned to the available filters. Otherwise, SAP ERP does not send data during the initialization mode.

8. Review the Customizing activities directly under **Logistics - General > Outbound** for applicability to your implementation. Each activity has attached documentation.
1. Maintain Control Parameters
 2. Maintain Additional Control Parameters
 3. Maintain Digital Document Types
 4. Maintain Sales Condition Type to Price TCD

Procedure for DDF System

1. Ensure that the prerequisites for each DDF inbound interface have been performed. For more information, see <https://help.sap.com/viewer/p/CARAB> > <Version> > Application Help > SAP Customer Activity Repository > Demand Data Foundation > Integration Information > Inbound Processing > Inbound Interfaces for Remote Function Call (RFC) Communication >.

i Note

The DDF organizational data has to match with the SAP ERP organizational data.

In SAP ERP, you can use the following tables to query the available organizational data:

- Distribution channel TVTW (VTWEG field)
- Sales organization TVKO (VKORG field)

- Purchasing group T024 (EKGRP field)
- Purchasing organization T024E (EKORG field)

In DDF you must define the organizational data. Use transaction code SPRO, and navigate to node

► [SAP Customer Activity Repository](#) ► [Demand Data Foundation](#) ► [Basic Settings](#) ►. You can choose to auto define the organizational data using Customizing activity [Define Default Values](#) or in the following activities under [Organizational Data](#):

- [Maintain Sales Organization](#)
- [Maintain Distribution Channel](#)
- [Maintain Distribution Chain](#)
- [Maintain Purchasing Organization](#)
- [Maintain Purchasing Group](#)

More Information

- For information about replicating SAP ERP promotions to DDF, see SAP Note [1830164](#).
- For information about replicating SAP ERP locations to DDF, see SAP Note [1825740](#).

4.1.2.1 (Optional) Extend Product Master Data by Custom Field

You can extend the DDF product master data by custom fields to replicate additional data from the source master data system (SAP Retail, SAP S/4HANA) into DDF. This cookbook explains the overall process by way of an example custom field. The extension includes the master data integration from the source master data system via the data replication framework (DRF, transaction DRFOUT).

Overview

The example used in the following is that of a *Yield Rate* field for detergents ("how many loads of laundry can you do with one carton of detergent").

To extend the product master data by this field, do the steps in the following sections.

Extend the /DMF/PROD Product Table

CI_PROD is a customer include structure. You can use this structure to enhance the DDF product master data in a modification-free way.

1. Log on to your SAP Customer Activity Repository back-end system.

2. Execute transaction SE11 and open the /DMF/PROD table in change mode.
3. Double-click the CI_PROD data element for the customer include structure. If it already exists, you can modify it. If it does not yet exist, create it.
4. Add *Yield Rate* as a component of the desired type (such as float).
5. Save your changes.

Import the Data into the Product Staging Table in DDF

Whichever process you use to import the data (data replication from source master data system, or upload from files), the /DMF/MDIF_PRODUCT_INBOUND function module is always called.

This function module serves as the DDF inbound interface for importing the product data. It has an interface parameter (structure) called IT_EXTENSIONIN. You can use this API parameter to send additional data (such as the *Yield Rate*).

For information on how to use the parameter (structure), see the SAP Support Portal at <https://support.sap.com> and search for **EXTENSIONIN**.

Send the Product Data from the Source Master Data System to DDF

Do the following before calling the /DMF/MDIF_PRODUCT_INBOUND function module remotely in DDF:

1. If you are using SAP ERP to send the data to DDF, the DMF_BADI_PRODUCT RFC SAP ERP Business Add-In is available to you. Use this BAdI to do the field mapping to the IT_EXTENSIONIN structure.
2. On the DDF side, implement the /DMF/PRODUCT_EXTENSION_CUST BAdI to do the mapping from the IT_EXTENSION structure to the CI_PROD field.

After you have done these steps, the custom field will be transferred from SAP ERP to DDF when you call the function module.

Transfer the Product Data from the Staging Table to the Production Table (Regular Inbound Processing in DDF)

Once the imported product data is available in the staging table in DDF, process it as usual. New fields (such as *Yield Rate*) will now be available in the product master data.

For information on how to process the data, see <https://help.sap.com/viewer/p/CARAB> <Version> Application Help > SAP Customer Activity Repository and search for section *Inbound Processing*.

Display the Product Master Data with the Custom Field

You will use the following objects in this step:

- /DMF/WDC_PROD_READ_UPD: the Web Dynpro component for the product master data
- V_READ: the view containing the product details

To display the product master data with the custom field, use the modification-free extension for Web Dynpro:

1. Follow the instructions in SAP Library for SAP NetWeaver at [Modification-Free Enhancements](#).
2. Additionally, you must add the new custom field to the V_READ view:
 1. Log on to your SAP Customer Activity Repository back-end system.
 2. Execute transaction SE80, choose *Repository Browser*, and select *Web Dynpro Comp. / Intf.* from the dropdown list.
 3. Search for the Web Dynpro component */DMF/WDC_PROD_READ_UPD*.
 4. Double-click *COMPONENTCONTROLLER*.
 5. Make sure the *Enhance* icon is active (CTRL + F4).
 6. Choose the *Context* tab and switch to change mode.
 7. Right-click the context node to which the new field should be added.
 8. Choose **► Create ► Attribute ►** to open the *Create Attribute* screen.
 9. Make the following settings:
 - *Attribute Name*: Enter the field name.
 - *Type*: Specify the field type.
 - Leave the other values unchanged.
 10. Save your changes by clicking the green check mark.
 11. Now you update the mapping:
Back in the Web Dynpro Component screen, choose *Views* and double-click the V_READ view.
 12. Choose the *Context* tab and switch to change mode.
 13. Right-click the context node to which you have previously added the custom field.
 14. Choose *Update Mapping*.
 15. Confirm all prompts.
 16. Expand the hierarchy node and verify that the new field is listed.

Result

You have successfully added the new custom field. Now you can bind it to the customer database field.

4.1.3 Configure DDF Integration Scenarios

Demand Data Foundation (DDF) has a standard integration for SAP ERP scenarios including single or multiple SAP ECC (SAP ERP Central Component) and SAP S/4HANA systems. In addition, integration with a third-party external system is possible in certain scenarios.

Prerequisites

- You have completed the *Set Up the Applications* section for your scenario in the *Common Installation Guide* at <https://help.sap.com/viewer/p/CARAB>.
- You have completed activities in [Configure Data Replication from SAP ERP to DDF \[page 160\]](#).

Context

The standard integration to SAP ERP systems provides master and historical transaction data to the Demand Data Foundation in the SAP Customer Activity Repository. Through the use of an outbound data replication framework (DRF) using transaction code **DRFOUT** you control and initiate the sending of master data and transactional data to the application server. On the application server, it is crucial to review each Customizing activity located in [► Cross-Application Components ► Demand Data Foundation ► Basic Settings](#). Reviewing the attached activity documents will ensure potential new entries have been populated. The receiving system (the application server) uses an inbound processing function to monitor, troubleshoot and populate the required tables. To integrate with a third party ERP scenario see <http://help.sap.com/viewer/p/CARAB> [► <your release> ► Application Help ► SAP Customer Activity Repository ► Demand Data Foundation ► Integration Information](#). This replication process is required for the following scenarios:

- Modeling and forecasting with Unified Demand Forecast (UDF)
- SAP Allocation Management
- SAP Assortment Planning
- SAP Merchandise Planning
- SAP Promotion Management

Review the following steps for your scenario.

Procedure

ERP Server

1. Use SAP logon to access the SAP Easy Access menu on your ERP server. Execute transaction **DRFOUT**. Use the program documentation and system help available on the [Execute Data Replication](#) screen to determine the values to enter.
2. Be sure to select the appropriate [Outbound Implementation](#) types required for your scenario. See [Configure Data Replication from SAP ERP to DDF \[page 160\]](#).

3. Choose *Execute* to process your selection.

Application Server

4. From the SAP Easy Access menu on your application server, execute transaction **NWBC** and choose

▸ *Services* ▸ *Monitor Imports* ▾.

5. Choose *Manual Processing* to select and process the message types corresponding to your outbound implementation types.

Related Information

[Configure Data Replication from SAP ERP to DDF \[page 160\]](#)

[Configure Demand Data Foundation \(DDF\) \[page 136\]](#)

4.1.3.1 Export ERP Promotions and Bonus Buys to DDF

This topic describes the Customizing activities in SAP ERP and Demand Data Foundation (DDF) systems to ensure a successful offer master data import.

Technical Details

ERP Server Minimum Release

Component	ERP Version	Service Pack
SAP_APPL617	EhP7	SP16
SAP_APPL618	EhP8	SP10
S4CORE 101	OP1610	SPS4
S4CORE 102	OP1709	FPS02

If your ERP system is not at the minimum of a release above, you can determine your upgrade path by consulting SAP Note [2556290](#).

Use

- Types of promotions exported:
 - Discount promotions
 - Future promotions

- Shopper card promotion types
- Delta handling of exported promotions
- Bonus Buys (BBY)
 - The BBY can derive data from the ERP promotion such as the currency or list of applicable plants.
 - The BBY ID must be a unique reference for DDF.
 - When there is a promotion on the fast entry and BBY tabs, it will result in 2 offers in DDF.
- Once the promotions are imported to DDF offers, the following is permitted.
 - The offer can be viewed in the UI ([Manage Promotional Offers](#) SAP Fiori app or SAP Promotion Management).
 - The offer can be used to copy/create new offer (it will no longer be associated to the ERP version).
 - The offer is consumable by Unified Demand Forecast (UDF).
 - The offer is consumable by Omnichannel Promotional Pricing (OPP).
 - The offer can be exported to SAP Marketing.

SAP ERP System

Customizing Activities

These activities are required for defining or mapping data from ERP promotions to DDF offers. For more information about each activity, see the accompanying system documentation (transaction `SPRO`).

- [Logistics - General](#) > [Merchandise Lifecycle Optimization](#) > [Outbound](#) > [Handling of Promotions](#) > [Define Tactic Types and Tactics](#) >
- [Logistics - General](#) > [Merchandise Lifecycle Optimization](#) > [Outbound](#) > [Handling of Promotions](#) > [Define Tactic Types and Tactics to Promotions](#) >
- ERP customer type for cards must be mapped to DDF offer incentives: [Logistics - General](#) > [Merchandise Lifecycle Optimization](#) > [Outbound](#) > [Handling of Promotions](#) > [Assign Customer Types to Incentive Class and Type](#) >
- Bonus Buy only: ERP material type (06) is mapped to DDF offer incentives: [Logistics - General](#) > [Merchandise Lifecycle Optimization](#) > [Outbound](#) > [Handling of Promotions](#) > [Assign Customer Types to Material Type Class and Type](#) >

Data Replication

To export promotions or Bonus Buys, use transaction `DRFOUT`. Choose your *Implementation Model*, then select *Outbound Implementation* **POFF** for ERP Promotions and **PBY** for bonus buys. The *Replication Mode* will process promotions and Bonus Buys for export as follows:

- Initial
 - Initial mode will load all promotions valid for export regardless of what has or has not been loaded previously for *PBBY*.
 - The filtering is based on filters persisted in *DRFF*.
 - Implementation *POFF* keeps track of promotions sent and will not initialize a promotion more than once.
- Changes

- Change mode operates on the changed-on date found in the header of promotions and bonus buy objects.
- All promotions valid for export that meet filter criteria will be sent if their changed-on date is between today and the last time DRFOUT change mode was executed.
- Manual
- The promotion, if valid for export, will be sent if it meets filter criteria.

When using DRFOUT outbound implementations P_{OFF} and P_{BY} to export, be sure to check the [Display Log](#) screen for exceptions.

Valid Bonus Buys for Export

The table below contains common BBY scenarios which are supported for export. Find the cell at the intersection of the combination of terms used in your BBY to determine if the scenario is valid for export.

BBY Matrix

Valid BBY Matrix - Match Scenario to Cell						
	Operator	Nothing on Buy Side	Total Minimum Value	Total Minimum Value with Buy Terms	Buy Terms	
		N/A		Or	And	Or
				And		And
Nothing on Get Side	N/A	BBY not allowed without a Get Side (auto-filtered out).				
Total Discount	N/A	Valid	Valid	Cannot combine Buy term with Total Minimum Value when operations type code is or (on DDF side).	Valid	Valid
Total Discount w/ Get Terms	And	Valid	Valid		Valid	Valid
Get Terms: Equal	Or	Valid	Valid		Valid*	Valid
	And					
Get Terms: From	Or	Valid	Valid		Cannot combine Get Terms: From with Buy Terms. Enforce Multiple can be used with Subsequent Discount = 0 for the Get: Equal Terms.	
	And					
Get Terms: Up To	Or	Up To requires equivalent Buy term.			Not Needed. See cell (Valid*).	Valid
	And					

Application System

Depending on the use of the ERP exported promotions and bonus buys, there are many activities affecting the resulting offer. Review Customizing activities in the following nodes as they pertain to your scenario.

- [▶ SAP Customer Activity Repository ▶ Demand Data Foundation ▶ Imported Data ▶ Offer ▶ Enhancements Using Business Add-Ins ▶](#)
- [▶ SAP Customer Activity Repository ▶ Demand Data Foundation ▶ Data Maintenance ▶ Offer ▶](#)

More Information

For importing offers, see sections *Data Management* and *Integration Information* under <https://help.sap.com/viewer/p/CARAB> [▶ <Version> ▶ Application Help ▶ SAP Customer Activity Repository ▶ Demand Data Foundation ▶](#).

For maintaining offers, see section *Promotion Management* under <https://help.sap.com/viewer/p/CARAB> [▶ <Version> ▶ Application Help ▶ SAP Promotion Management ▶](#).

4.1.3.2 Create SAP Promotion Management Wholesale Offers

Creating an offer in wholesale mode requires specific entries, which are described in this topic.

To be able to create wholesale offers, make sure that the following criteria are met:

- Locations of customer type have been imported into Demand Data Foundation (DDF) using DRF outbound implementation `PCUS`.
- The location products for locations of customer type have been imported using DRF outbound implementation `PMCS`.
- You have created a promotion location hierarchy (type 05) consisting of locations of customer type (location type 1010).
- You have completed Customizing activity [▶ SAP Customer Activity Repository ▶ Demand Data Foundation ▶ Data Maintenance ▶ Location ▶ Maintain Text of BP Role ▶](#).

4.1.4 Optimize DDF Performance

Check SAP Notes for Latest Performance Corrections

Since your version of SAP Customer Activity Repository applications bundle was released, new performance enhancements and corrections might have become available. For up-to-date information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> and consult the following SAP Notes:

- Under *Installation and Upgrade*, see the release information notes (RINs):

i Note

For each release, there is always one RIN listing the latest back-end corrections, and one RIN listing the latest front-end corrections.

- Under *Performance*, see the overall performance note for SAP Customer Activity Repository applications bundle.

For additional performance recommendations, see the following references:

- SAP Note [2707569](#) (Performance Considerations for SAP Customer Activity Repository applications bundle 4.0)
- SAP Note [2822085](#) (Manage Promotional Offer Search)

Limit Products and Locations

Use one of the following Business Add-Ins (BAIs) in transaction `SE18` to limit the products and locations that are displayed when an offer is opened:

- `/DMF/GW_TERM_OBJECT_SUBSET`. You can use this BAI to limit the number of products returned for product groups and product hierarchy nodes. This is used when selecting a product group for the first time.
- `/DMF/GW_OFPR_PROD_SUBSET`. You can use this BAI to limit the number of products returned for an offer. The default implementation limits up to 1,000 products spread evenly between all terms and versions.

Limit Number of Financial Records

You can limit the number of financial records that are generated within an offer by specifying the level of detail at which the records are stored. You have the following options:

- all levels (product locations, products, locations, and total)
- only aggregates (products, locations, and total)
- totals only (locations and total)

To set this value, use Customizing activity (transaction `SPRO`) *SAP Customer Activity Repository > Demand Data Foundation > Data Maintenance > Offer > Maintain Indicators for Offer Calculations*.

For more information, see SAP Notes [2783863](#) and [2783864](#).

Change the Maximum Number of Records for Processing (Batching)

You can change the maximum number of records for processing (batching). With this option you can reduce the number of calls between the application and the forecasting engine for improved performance.

To set this value, use Customizing activity (transaction `SPRO`) *SAP Customer Activity Repository > Demand Data Foundation > Data Maintenance > Offer > Specify Parameters for Offer Financials*. Update Max Fin Records to a very large number (such as 1,000,000). While 1,000,000 is a good number to start with, each system is different and it is recommended to test with alternative numbers (smaller or larger) to get the best performance for your scenario.

Adjust Load Balancing Parameters

You can review and, if necessary, adjust your load balancing parameters (Num Records, Max Work Processes) to optimize performance for the following processes:

- demand modeling
- demand forecasting (only for production forecasts; not possible for what-if forecasts)
- calculation of hierarchical priors (HPRs)

Limit the Number of Products Displayed

You can limit the number of products displayed in product detail of the offer UI, which improves the performance of opening an offer.

Implement SAP Notes [2732884](#) and [2732333](#). This new feature will push the filters down to the database and improve performance of opening an offer. There are manual instructions to be aware of, so the notes must be applied separately.

Optimize Purchase Order Data Replication

Purchase Order data replication (DRF Outbound Implementation `PURCH_ORDER`) uses the `CDPOS` table to monitor changes. The standard code uses a `FOR ALL ENTRIES` on this table since any joins will result in a syntax error. In order to improve performance for HANA-based systems only, you can implement the example code provided in `CL_EX_PURCH_ORDER` in the BAdI: Read Purchase Order (`DMF_BADI_PURCH_ORDER`). See BAdI documentation for further information.

For more information and additional tips and best practices, see the [Optimize UDF Performance \[page 217\]](#) section of the *SAP Customer Activity Repository Administration Guide*. You can find this guide on SAP Help Portal under <https://help.sap.com/viewer/p/CARAB> > <Version> > Administration >.

4.2 Set Up and Configure DDF Services

Set up and configure services that the Demand Data Foundation module in SAP Customer Activity Repository provides for different scenarios and consuming applications.

[Calculate Distribution Curves \[page 174\]](#)

Demand Data Foundation (DDF) can calculate distribution curves for different scenarios. Depending on the scenario, the service is implemented in a different way in the requesting consuming application. No specific configuration is required on the DDF side.

[Set Up the Similar Products Search \[page 182\]](#)

Do several setup steps in the back-end system and the front-end system. Then import the product attributes and descriptions from the source master data system into Demand Data Foundation (DDF). As a last step, run price binning so the search can also consider product prices.

[Import Product Attributes and Descriptions from Source Master Data System into DDF \[page 184\]](#)

To use the product attributes and descriptions for the similar products search or other scenarios, you must make this data available in DDF. First you do some configurations in Customizing. Then you run reports that import the product characteristics (attributes) and their assignments to products from the source master data system (SAP Retail or SAP S/4HANA) into DDF.

4.2.1 Calculate Distribution Curves

Demand Data Foundation (DDF) can calculate distribution curves for different scenarios. Depending on the scenario, the service is implemented in a different way in the requesting consuming application. No specific configuration is required on the DDF side.

Use

The *Calculate Distribution Curves* service of DDF analyzes historical daily sales data that spans over all sizes and colors of a particular product, while considering past and future season information.

You can use the calculated distribution curves to support the manual or automatic allocation of products to locations (in particular, lifecycle products such as fashion).

Supported Scenarios

[Calculate Distribution Curves for Different Consuming Applications \[page 175\]](#)

Configure the distribution curve calculation in Customizing and set up the *Configure Distribution Curves* SAP Fiori app in SAP Customer Activity Repository. The calculation service and the app can be used by different consuming applications (such as SAP Allocation Management) or by customer-specific applications built on top of SAP Customer Activity Repository. Demand Data Foundation (DDF) calculates the distribution curves as requested by the consuming application and using the settings previously configured in the app.

[Calculate Distribution Curves for External System \[page 180\]](#)

Use the `/DMF/DC_COMPUTE` function module to execute a Remote Function Call (RFC) from an external system to Demand Data Foundation (DDF) to calculate distribution curves for your scenario. Use the import parameters of the function module to configure the calculation. No specific configuration is required on the DDF side.

4.2.1.1 Calculate Distribution Curves for Different Consuming Applications

Configure the distribution curve calculation in Customizing and set up the *Configure Distribution Curves* SAP Fiori app in SAP Customer Activity Repository. The calculation service and the app can be used by different consuming applications (such as SAP Allocation Management) or by customer-specific applications built on top of SAP Customer Activity Repository. Demand Data Foundation (DDF) calculates the distribution curves as requested by the consuming application and using the settings previously configured in the app.

Context

Distribution curves represent the proportional contribution of different sizes (and/or colors) to the sales of a product or product group. For example, fashion companies use distribution curves to break down planned quantities from product/color level to size level for different use cases (such as planning, buying, and allocations).

Example

SAP Allocation Management uses distribution curves in the sense of size curves to automatically break down the quantities from “product on color level” to “size level”. Typically, the historical size distribution is analyzed to anticipate the future size distribution for a specific product/color.

Typical Use Cases

Use case 1: Calculate distribution curves for new products

You want to calculate distribution curves based on the aggregated sales of **similar** products in **similar** locations and use the results for **new** products that do not yet have historical sales in a particular location (or in any location).

Use case 2: Normalize the sales of product locations where not all the variants have sales

Context

A normalization of the historical sales can be helpful in the following situations:

- You have products where some variants are not available for sale in all locations. Some locations might not have been allocated all the variants of a product. For example, only megastores might carry the XXS and XXL sizes. As those sizes were not available in the other locations, their historical sales in those locations amount to zero. It would be incorrect, however, to consider the zero unit sales as such in the calculation. This would imply that the variants were available but that there was no demand for them. If normalized, the sales are aggregated for a different number of products for each attribute combination. The system uplifts the sales where not all locations were able to contribute to the aggregated number.
- You have a generic product that does not have a certain size/color combination, but other generic products under the same product hierarchy node do. Example: G1 does not exist in size L / color red but G2 does and is sold. If G2 is included in the aggregation, then the distribution curve for G1 contains L/red, although this combination does not exist for G1.

Configuration

In the *Configure Distribution Curves* app, you can choose to normalize the sales (option *Apply Normalization of Sales*). You can apply the normalization by product category.

Your selection is persisted in the `APPLY_NORMALIZATIONCTR` field of the `/DMF/DCC_MAIN` table.

Use case 3: Exclude untypical sales types from the calculation

Context

There are situations where you can achieve more accurate results if you first exclude sales types that are not typical or representative for the distribution. For example, this might be products sold at a discounted price or products that customers later returned to the store.

Configuration

In the *Configure Distribution Curves* app, you can choose to exclude the following sales types from the calculation:

- *Exclude Promotion Sales*
- *Exclude Clearance Sales*
- *Exclude Markdown Sales*
- *Exclude Customer Returns*

i Note

The system identifies the sales types by their price type code (field `PRC_TCD` in the time series table for POS data, `/DMF/TS_PS`). For example, markdown sales have price type code 06. Clearance sales have

price type code 07. The respective sales records are filtered out at the variant-location-day level and ignored in the calculation.

The sales are filtered per record and not per date. For example, if there are both regular sales and promotion sales for the same date and you are excluding promotion sales, only the promotion sales for that date will be excluded, while the regular sales will be considered.

Prerequisites

To configure and calculate distribution curves, the following minimum prerequisites must be fulfilled:

i Note

Depending on the consuming application and scenario, additional prerequisites might apply. For information, see the product documentation of your application (for example, SAP Allocation Management or SAP Assortment Planning). You can find all product documentation on SAP Help Portal at <https://help.sap.com/viewer/p/CARAB>.

- **Installation and setup:**
 - You have set up the ABAP back-end server and the ABAP front-end server as described in the *Common Installation Guide* (for new installations) or the *Common Upgrade Guide* (for upgrade scenarios). You can find both guides at <https://help.sap.com/viewer/p/CARAB>.
 - You have set up the *Configure Distribution Curves* app for your scenario as described in the same guides above.
 - You have fully configured the DDF module in SAP Customer Activity Repository. See [Configure Demand Data Foundation \(DDF\) \[page 136\]](#).
- **Data requirements:**
 - **Time series:** Your historical sales data must be daily level point-of-sale data (time series source POS_TS, table /DMF/TS_PS, time granularity *Day*).
 - **Hierarchies:** The master data hierarchies that you wish to use are not time-dependent. You cannot use time-dependent hierarchies.

Implementation

How Distribution Curves are Calculated in DDF

In DDF, the service is implemented as follows and made available to the consuming applications:

Calculation of Distribution Curves in DDF

Calculation request	The consuming application calls an ABAP Managed Database Procedure (AMDP) in SAP Customer Activity Repository (/DMF/CL_DISTRIBUTION_CURVE=>COMPUTE ()) in package /DMF/DIST_CURVE).
----------------------------	---

Configuration

Customizing

See the following Customizing activities under [▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Distribution Curve Configuration ▶](#):

- [Define Consuming Applications for Distribution Curves](#)
- [Define Usage Types for Distribution Curves](#)
- [Assign Consuming Applications to Usage Types](#)
- [Maintain Expiry and Reorganization Periods for Drafts](#)

For more information, see the documentation of each activity in transaction [SPRO](#).

SAP Fiori App

Use the [Configure Distribution Curves](#) app to define input parameters for the calculation. For example, you can specify whether you want to use additional product attributes for the aggregation. Or you can define the analysis period for season dependent and season independent products.

DDF stores the settings from Customizing and the app in the tables in package `/DMF/DIST_CURVE`.

Calculation scope

DDF receives the following input values via the AMDP:

- Target generic products in the specified locations for which the distribution curves should be calculated (`prod_loc_list`)

i Note

You define the product hierarchy in Customizing for [Define Default Values](#) under [▶ Cross-Application Components ▶ Demand Data Foundation ▶ Basic Settings ▶](#).

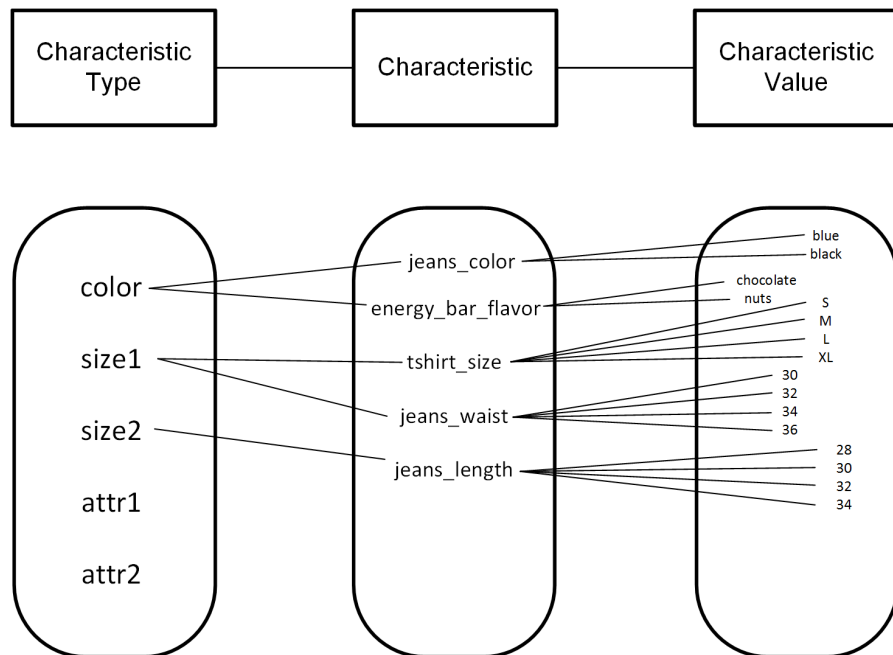
- Target planning seasons of the target products (`prod_season_list`)
Season parameters: Each target product is given a season ID and a season year (both optional) as input parameters.
 - If the parameters are supplied, the target product is treated as "season dependent product".
 - If the parameters are empty, the target product is treated as "season independent product".
- Target planning date (`planning_date`)
- Specific distribution curve configuration (DCC) based on the consuming application (`consuming_application`)
- Flag to either discard (default setting) or keep the temporary tables (`keep_temp_tables`)

Based on the input and the data in the `/DMF/DIST_CURVE` tables, DDF determines the relevant historical data for the sales analysis:

- Sales analysis period
 - Source product locations whose historical sales to aggregate for the analysis
-

Aggregation concept

- The historical sales of the source product locations are aggregated along the defined characteristics.



Example Characteristics for Color and Sizes

- You define only those characteristics that you need for the particular product. For example, one of your products is a pair of jeans in color blue that is sold in sizes S, M, and L. You want to consider only the *Color* characteristic for this product. The sales of the variants (sizes) are then aggregated as follows for this color: $blue = S/blue + M/blue + L/blue$
- The system assumes that all variants of the same generic product have identical characteristics.

Messages

Messages triggered by a configuration or calculation issue are written to the following message classes in package /DMF/DIST_CURVE:

- Configuration messages: /DMF/DCC
- Calculation messages: /DMF/DCE

Calculation results and extensibility options

- DDF provides the following output:
 - Target product locations
 - Attribute value IDs for COLOR_ATR_VAL_ID, SIZE1_ATR_VAL_ID, SIZE2_ATR_VAL_ID, ATR1_ATR_VAL_ID, and ATR2_ATR_VAL_ID
 - Distribution values (sum of sales) QUOTE_VALUE
 - The output is calculated on the fly and is not accessible via SAP HANA views.
 - You might wish to modify the output for the follow-on processes of your scenario. Use the BAdIs under [▶ Cross-Application Components ▶ Demand Data Foundation ▶ Data Maintenance ▶ Distribution Curve Configuration ▶ Enhancements Using Business Add-Ins ▶](#):
 - *BAdI: Check and Modify Distribution Curve Results*
 - *BAdI: Distribution Curve Field and Functional List - Entities*
 - *BAdI: Distribution Curve Field and Functional List - Location Group*
 - *BAdI: Distribution Curve Field and Functional List - Product Group*
 - *BAdI: Distribution Curve Field and Functional List - Reference Season*
- For more information, see the documentation of each BAdI in transaction **SPRO**.

In SAP Allocation Management

For information on how distribution curves are configured and used in SAP Allocation Management, see the following sections at <https://help.sap.com/viewer/p/CARAB> under [▶ Application Help ▶ SAP Allocation Management ▶](#):

- Setup information: [▶ Setting up Supporting Processes ▶ Distribution Curve Analysis ▶](#) (including all subsections)
- Configuration via SAP Fiori app: [▶ SAP Fiori Apps for SAP Allocation Management ▶ Configure Distribution Curves ▶](#)
- Use: [▶ Allocation Plan ▶ Allocation Plan Details ▶](#) (distribution curve result as a key figure in the allocation plan)

4.2.1.2 Calculate Distribution Curves for External System

Use the /DMF/DC_COMPUTE function module to execute a Remote Function Call (RFC) from an external system to Demand Data Foundation (DDF) to calculate distribution curves for your scenario. Use the import parameters of the function module to configure the calculation. No specific configuration is required on the DDF side.

Prerequisites

- **Supported time series**
Your historical sales data must be available as point-of-sale data (time series source POS_TS).

- **Supported hierarchies**
You cannot use time-dependent master data hierarchies.

Implementation

Calculation of Distribution Curves in DDF for External System

RFC function module	<p>The implementation is based on the following:</p> <ul style="list-style-type: none"> • Function module /DMF/DC_COMPUTE in package /DMF/DISTRIBUTION_CURVE • RFC service /DMF/DC_COMPUTE in package /DMF/DIST_CURVE
Calculation request	<p>You request the calculation...</p> <ul style="list-style-type: none"> • from the external system via the function module • to the DDF module in SAP Customer Activity Repository
Calculation scope	<p>You define the scope of the calculation using the import parameters of the function module:</p> <ul style="list-style-type: none"> • You can calculate the distribution curves for the following: <ul style="list-style-type: none"> ◦ all variants of the specified generic product in the specified location or ◦ all variants of the specified product group (product hierarchy node) in the specified location group (location hierarchy node) • You can define the following product attributes: <ul style="list-style-type: none"> ◦ <i>COLOR</i> ◦ <i>SIZE1</i> ◦ <i>SIZE2</i> • You can further narrow down the selection by specifying additional import parameters (such as season information or a sales period). • The calculation is based on the aggregated historical sales of all the product variants in the specified locations.
Aggregation concept	<ul style="list-style-type: none"> • The historical sales of the product variants in the specified locations are aggregated along the specified import parameters. • You need to define only those parameters that you need. • Example aggregation: You have a T-shirt in color red that is sold in sizes S, M, and L. You want to consider only the <i>COLOR</i> attribute. The sales of the variants will be aggregated as follows for this color: $red = S/red + M/red + L/red$

Calculation result

- The output is a quote value for each attribute value combination for the specified attributes.
The quote value is an aggregation of the unit sales of the different product variants in the different locations that share the identical attribute value combination of the specified attributes.
 - The output can also be consumed via the `sap.is.ddf.dc::ExtDistributionCurveQuery` SAP HANA view in SAP Customer Activity Repository.
-

Configuration and Execution

1. Execute transaction **SE37**, display the `/DMF/DC_COMPUTE` function module, and consult the *Function Module Documentation*. You can find there detailed information on the prerequisites, import and export parameters, and a configuration example.
2. Follow the instructions.
3. Execute the function module from the external system.

4.2.2 Set Up the Similar Products Search

Do several setup steps in the back-end system and the front-end system. Then import the product attributes and descriptions from the source master data system into Demand Data Foundation (DDF). As a last step, run price binning so the search can also consider product prices.

Prerequisites

i Note

All product documentation is available on SAP Help Portal at <https://help.sap.com/viewer/p/CARAB>.

- You have installed the ABAP back-end server and ABAP front-end server for your version of SAP Customer Activity Repository applications bundle. For instructions, see the *Common Installation Guide* (for new installations) or the *Common Upgrade guide* (for upgrade scenarios).
- You have done all the tasks described in either guide under **► Set Up the Applications ► SAP Customer Activity Repository ► Core (Mandatory for All Applications) ►**.

Context

You use the following tools to configure and run the search:

- In the front-end system, you use the *Manage Product Attributes* SAP Fiori app to configure the similar products search for your scenario.
- In the back-end system, you use the `/DMF/PRODUCT_SIMILARITY_FM` function module to perform additional configurations and to run the search.

i Note

For more information on the search features and configuration options, see the *Find Similar Products* section of the SAP Customer Activity Repository application help.

How to Set Up the Search

Set Up the Back-End System and the Front-End System

What To Do	Where To Find Instructions
In Your Back-End System	
Fully configure the DDF module in SAP Customer Activity Repository.	In this guide, section Configure Demand Data Foundation (DDF) [page 136]
Assign an area of responsibility (AOR) to your ABAP back-end user. You can only display and select product hierarchies in the <i>Manage Product Attributes</i> app that have been assigned to you as your AOR. Use the <i>Maintain Area of Responsibility</i> service in transaction <code>NWBC</code> for this.	Application help for SAP Customer Activity Repository, section <i>Maintain Area of Responsibility</i>
Import the product attributes and descriptions from the source master data system into DDF so they are available for configuring and running the search.	In this guide, section Import Product Attributes and Descriptions from Source Master Data System into DDF [page 184]

What To Do

Where To Find Instructions

Run price binning (function module /DMF/GENERATE_PRICE_BINS).

This step is optional but highly recommended. It makes pricing information available for use in the *Manage Product Attributes* app (as attribute PRICE_BIN_FOR_SIMILAR_PRODUCTS) and in the similar products search itself (function module /DMF/PRODUCT_SIMILARITY_FM).

System documentation of the /DMF/GENERATE_PRICE_BINS function module in transaction SE37

→ Tip

For input, price binning can use price data in the /DMF/PRC table and in the /DMF/PRODLOC_PRC table.

Depending on your scenario, you should use the following table:

- For **retail scenarios**, we recommend that you provide the price data in the /DMF/PRODLOC_PRC table.
- For **wholesale scenarios**, we recommend that you provide the price data in the /DMF/PRC table.

Set up and configure SAP HANA workload management (optional).

In this guide, section [Optimize UDF Performance \[page 217\]](#), see under *Configure SAP HANA Workload Management (Recommended)*

The information applies to the similar products search as well.

In Your Front-End System

Set up the *Manage Product Attributes* app so that it is available in your SAP Fiori launchpad.

Common Installation Guide, section *Set Up the Manage Product Attributes App*

4.2.3 Import Product Attributes and Descriptions from Source Master Data System into DDF

To use the product attributes and descriptions for the similar products search or other scenarios, you must make this data available in DDF. First you do some configurations in Customizing. Then you run reports that import the product characteristics (attributes) and their assignments to products from the source master data system (SAP Retail or SAP S/4HANA) into DDF.

Procedure

1. Log on to your back-end system.

- In Customizing (transaction SPRO), navigate to **Cross-Application Components > Demand Data Foundation > Data Maintenance > Attributes**.

Note

For more information about the Customizing activities, Business Add-Ins (BADIs), and reports mentioned in the next steps, see the accompanying system documentation.

- Ensure that you have made all the required entries in the following Customizing activities:
 - [Define Function Types](#)
 - [Maintain Number Range for Attributes](#)
 - [Maintain Number Range for Attribute Values](#)
- (Optional) Create enhancement implementations for the BADIs listed under [Enhancements Using Business Add-Ins](#). For example, you might wish to create an enhancement implementation to import additional attributes or values.
 - [BAdI: Support Assignment of User-Defined Attribute Types](#)
 - [BAdI: Manage Attributes and Function Types](#)
- (Optional) The /DMF/API_ATTRIBUTES_SRV OData service is available for integration scenarios with **non-SAP source master data systems**. You can use it to import external attributes. For technical details and entity descriptions, see the application help for SAP Assortment Planning at <https://help.sap.com/viewer/p/CARAB> and search for section *Import External Attributes*. For activation instructions, see section *Activate OData Services* in the *Common Installation Guide*.
- To import the attributes and descriptions, execute the following reports (programs) in the following order:
 - /DMF/ATR_IMPORT
 - /DMF/PROD_ATR_IMPORT
 You can either execute the reports directly (transaction SE38) or you can schedule them for later execution (transaction SM36). For recommendations, see the next section.

Best Practices

You should run the two reports on a regular basis to ensure that the product descriptions and attributes in your back-end system are up-to-date. For example, when products are changed, added, or deleted in your source master data system, you want these changes to be reflected in DDF.

When to Execute the Reports

	Report /DMF/ATR_IMPORT	Report /DMF/PROD_ATR_IMPORT
What data is imported into DDF?	<ul style="list-style-type: none"> Product characteristics as attributes Corresponding attribute values 	Characteristics assignments to products

	Report /DMF/ATR_IMPORT	Report /DMF/PROD_ATR_IMPORT
When should you execute the reports?	<ul style="list-style-type: none"> At initial system setup For this, you might choose to run the reports as manual tasks. Use transaction <code>SE38</code>. Based on the frequency of master data changes in the source master data system For this, you might choose to set up scheduled periodic background jobs. Use transaction <code>SM36</code>. 	
What if something goes wrong?	Analyze the application log using transaction <code>SLG1</code> for object <code>/DMF/APPL</code> and subobject <code>/DMF/ATR</code> . If there are errors, you may need to correct them and restart the import manually or wait until the next import is scheduled.	
Can you import additional data?	If you wish to import additional attributes or values, create an enhancement implementation for BAdI <i>BAdI: Manage Attributes and Function Types</i> .	


4.3 Configure Unified Demand Forecast (UDF)

Configure the UDF module in SAP Customer Activity Repository to adjust demand modeling and forecasting for your scenario. You can select from multiple UDF features, optimize performance for your scenario, and configure parameters for modeling and for forecasting. Additionally, you can set up the demand planning apps.

Prerequisites

- You are aware that these are advanced configurations that should only be done by experts (such as consultants, forecast analysts, or demand planners).
- You are aware that it is always better to enrich the demand model with additional information than to manually correct the forecast with absolute values afterwards. The model fit is recalculated with each run. If you can adjust the configuration to improve the model fit, this improvement is sustainable and also benefits the forecast.
- You have set up UDF as described in the *Complete UDF Setup* section of the *Common Installation Guide* (for new installations) or the *Common Upgrade Guide* (for upgrade scenarios). You can find both guides on SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> under `>> <Version>` `>` *Installation and Upgrade* `>`.
- (Optional) Only relevant if you wish to retrieve the UDF forecasts into SAP Forecasting and Replenishment (via the `/DMF/UFC_RETRIEVE_RESULTS_FR` RFC-enabled function module):
Before configuring UDF for this scenario, see the prerequisites and implementation information at <https://help.sap.com/viewer/p/CARAB> under `>> <Version>` `>` *Application Help* `>` *SAP Customer Activity Repository* `>` *Unified Demand Forecast* `>` *General Services* `>` *Provide Demand Forecasts to External System* `>`.


Troubleshooting

- If you are experiencing issues when configuring, testing, or operating UDF, see [Troubleshooting for Modeling and Forecasting \[page 300\]](#) for possible solutions.
- If you are experiencing issues in the database, see the *SAP HANA Troubleshooting and Performance Analysis Guide* for your SAP HANA Platform version at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM under [▶ <Version> > Administration](#) .

Configuration Procedures

Caution

The following procedures describe how to configure specific UDF features. Before changing a default configuration, make sure that you are familiar with the corresponding feature and that you have a clear understanding of the impact of the planned change.

You can find the feature descriptions at <https://help.sap.com/viewer/p/CARAB> under [▶ <Version> > Application Help > SAP Customer Activity Repository > Unified Demand Forecast](#) .

Caution

The default settings for modeling and forecasting have been chosen very carefully. Do not change them until you have conducted an in-depth statistical analysis and have carefully tested and validated each potential adjustment or addition. Otherwise, the modeling and forecasting functions might be compromised.

[Best Practices \[page 189\]](#)

Get best practices and recommendations on configuring and running modeling and forecasting.

[Configure Parameters for Modeling \[page 193\]](#)

Define additional parameters in the *Define Modeling Control Settings* Customizing activity to override system defaults for demand modeling and the calculation of hierarchical priors.

[Configure Parameters for Forecasting \[page 206\]](#)

Define additional parameters in the *Define Forecasting Control Settings* Customizing activity to override system defaults for demand forecasting.

[Optimize UDF Performance \[page 217\]](#)

Get recommendations on how to optimize modeling and forecasting with Unified Demand Forecast for different scenarios. As the UDF application function library (UDF AFL) runs directly in the SAP HANA database, performance considerations for SAP HANA are also relevant, and included here.

[Partition Tables for UDF and DDF \[page 225\]](#)

If your forecasting scenario involves large numbers of products and locations, the relevant Unified Demand Forecast (UDF) and Demand Data Foundation (DDF) tables can become very large. To improve standard database operations (such as inserting, updating, deleting, and reading) and mass operations (such as archiving or index merging), we recommend to partition those tables.

[Configure Hierarchical Priors \(HPRs\) \[page 226\]](#)

Configure the calculation of hierarchical priors to enhance the modeling of products for which little or no historical sales data or promotional data is available. With hierarchical priors, such products can “inherit” existing modeling results from suitable existing products along the hierarchies (product hierarchies, location hierarchies, relationships between generic products and their variants).

[Configure Time-Dependent Error Variances \(Recommended\) \[page 230\]](#)

Enable the calculation of time-dependent error variances for **modeling** and for **forecasting**. We highly recommend that you do this for any scenario. In replenishment scenarios, for example, time-dependent error variances allow you to get more accurate service levels and safety amounts. Note, however, that the calculation might have an impact on performance, especially in modeling.

[Configure User DIFs \[page 232\]](#)

User DIFs are generic demand influencing factors that you can define as additional input for modeling and forecasting. User DIFs can be Boolean, metric, or Ignore DIFs. They complement the system DIFs because they allow you to feed external past and future events and factors into the system that have an impact on consumer demand.

[Configure User DIFs for Promotion Cannibalization for SAP Advanced Trade Management Analytics \[page 236\]](#)

How you can measure promotion cannibalization in UDF for SAP Advanced Trade Management Analytics scenarios.

[Configure Ignore DIFs \[page 239\]](#)

Ignore DIFs are Boolean user DIFs that you configure with *DIF Usage Mode* set to *Exclude Observations*. In all other respects, you configure Ignore DIFs like user DIFs.

[Configure Reference Products \[page 239\]](#)

Use reference products to enhance the modeling of products for which little or no historical data is available (such as new products without past sales or promotions).

[Configure Placeholder Products \[page 240\]](#)

Create placeholders for products that are still being planned and for which you do not yet have all the information to create them in your source master data system (such as SAP ERP). For example, placeholder products are useful during promotion planning or assortment planning.

[Configure Forecasting Based on Aggregated Product Data \(Aggregation Profile 0001\) \[page 241\]](#)

Aggregation profile 0001 is designed for out-of-the box integration with the in-season fill-in scenario in SAP Allocation Management. The configuration and scheduling are performed in SAP Allocation Management. No additional configuration is required in Unified Demand Forecast (UDF). This section describes the aggregation profile in more detail.

[Configure Modeling for Group of Product Locations \(Aggregation Profile 0002\) \[page 243\]](#)

Configure aggregation profile 0002 to run demand modeling on a specified group of product locations, using aggregated point-of-sale (POS) data for input. Then use the results of this aggregated modeling to enhance the modeling and forecasting at the product location level.

[Configure Demand Decomposition \[page 248\]](#)

Configure UDF to break down the modeled historical demand and the forecasted future demand by demand influencing factor (DIF). This “demand decomposition” shows you how much of the total value can be attributed to baseline business and how much is due to specific DIFs. Examples include offers, prices, tactics, public holidays, or seasonality.

[Configure Holdout Forecasts \[page 249\]](#)

Holdout forecasts allow you to compare the generated forecast against the actual sales data. You withhold some of this data from being considered in the modeling and forecasting processes for that period, and then you compare the results to the actual sales data that was withheld.

[Configure Intraday Forecasts \[page 251\]](#)

To generate intraday forecasts, you must configure both the UDF module and the OSA module in SAP Customer Activity Repository. The daily forecasts (UDF) and the intraday distribution pattern (OSA) are combined into the intraday forecasts.

[Configure Forecast Confidence Index \(FCI\) \[page 251\]](#)

When you are planning offers and performing what-if forecasts in SAP Promotion Management, the FCI can help you determine the best offer terms and conditions. You can configure UDF to calculate the FCI when generating the what-if forecasts.

[Configure Modeling and Forecasting by Tactic Type \[page 254\]](#)

In trade management scenarios, for example, you might want to generate forecasts by tactic type only, to be able to assess the effect of different tactic types in general before creating actual promotions.

4.3.1 Best Practices

Get best practices and recommendations on configuring and running modeling and forecasting.

Prerequisites

- You have set up Unified Demand Forecast (UDF) as described in the following guides at <https://help.sap.com/viewer/p/CARAB> under ► *Installation and Upgrade* ☒:
 - For new installations, see the *Common Installation Guide*.
 - For upgrade scenarios, see the *Common Upgrade Guide*.
- You have configured the desired UDF features as described here in this *SAP Customer Activity Repository Administration Guide*.
- You know how to run UDF modeling and forecasting using the *Schedule Model and Forecast* service in transaction NWBC.
- (Optional) You have set up the demand planning apps (*Analyze Forecast*, *Adjust Forecast*, *Manage Demand Influencing Factors*) as described in the same guides above.

Schedule Model and Forecast Service: Configure and Run UDF Jobs for Different Use Cases

Configure the job and choose a suitable execution mode based on the following considerations:

Execution Modes	Things to Consider
Production mode	<ul style="list-style-type: none"> To execute a job in production mode, leave the <i>Diagnostic ID</i> blank. Use this mode to generate modeling and forecast results for productive use and follow-on processes in the consuming applications (such as SAP Promotion Management or SAP Forecasting and Replenishment). The generated production demand model and production forecast are persisted in the database.
Diagnostic mode	<ul style="list-style-type: none"> To execute a job in diagnostic mode, select a <i>Diagnostic ID</i>. <div data-bbox="598 792 1394 1003" style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 10px; margin: 10px 0;"> <p>Note</p> <p>You define diagnostic IDs in Customizing under Cross-Application Components > Demand Data Foundation > Modeling and Forecasting > Define Diagnostic IDs.</p> </div> <ul style="list-style-type: none"> Use this mode to run modeling and forecasting for diagnostic purposes, for data analyses, simulations, or trial runs. Limit the run to only those products and locations that are relevant for your analysis. The generated diagnostic demand model and diagnostic forecast are not persisted in the database.
Configuration ID	<ul style="list-style-type: none"> Create a configuration ID for a run if you wish to use a different configuration for only a subset of your assortment. You can combine a <i>Configuration ID</i> with a <i>Diagnostic ID</i>. If you wish to generate what-if forecasts for SAP Promotion Management, you can only use a <i>Configuration ID</i> for modeling but not for forecasting.
Custom configurations	<p>Use a <i>Diagnostic ID</i> and, optionally, a <i>Configuration ID</i> to first test any changes to the system defaults that you wish to make. For instructions and configuration options, see the following sections:</p> <ul style="list-style-type: none"> Configure Parameters for Modeling [page 193] Configure Parameters for Forecasting [page 206]

Job Monitoring: Check the Status of UDF Jobs

In your back-end system, execute transaction SM37 to open the job viewer. Check the status of your jobs (for example, modeling, forecasting, or the calculation of hierarchical priors).

For more information on this and other monitoring tools, see <https://help.sap.com/viewer/p/CARAB>

▶ [<Version>](#) ▶ [Application Help](#) ▶ [SAP Customer Activity Repository](#) ▶ and search for section *Monitor, Manage, and Troubleshoot Forecast-Related Jobs*.

UDF for SAP Promotion Management: Generate What-If Forecasts for Offers

i Note

You can use UDF to forecast the effect of planned offers created in SAP Promotion Management. This forecast, which you trigger from SAP Promotion Management, is referred to as the “what-if forecast”.

Verify Correct Offer Translation Between SAP Promotion Management and UDF

After creating an offer in SAP Promotion Management and running modeling, you should verify that the offer terms have been translated correctly. As demand forecasting uses the modeling data for input, this helps to ensure that the offer is considered correctly in forecasting.

→ Tip

This check is particularly important during the initialization phase. Once your SAP Promotion Management scenario is up and running and the offer types have been configured, it is sufficient to do the check sporadically.

1. Log on to your back-end system.
2. Execute transaction [SE16](#) and open the modeling results table (/DMF/UMD_TS).

i Note

The table includes the offer lift type codes. The type codes serve to classify offers and help you identify issues with unclassified offers. This is true for what-if forecasts and also production forecasts.

3. Verify the information in the *Offer Lift Type Code* field (OFR_LIFT_TCD). You can use the table below for reference.

→ Tip

Type codes **98** and **99** indicate issues, always investigate these.

Offer Lift Type Code	What It Means and What to Do
98 INVALID_PROMO	Indicates a structurally invalid offer. This means the construction of the offer terms is not feasible. Check the offer configuration in SAP Promotion Management and correct any issues.

Offer Lift Type Code	What It Means and What to Do
<p>99</p> <p>UNSUPPORTED_PROMO</p>	<p>Indicates an unsupported offer. This means the offer is valid but is of a type not supported by UDF, or it is supported but has an invalid condition.</p> <p>Check the offer configuration in SAP Promotion Management and make sure it fulfills the requirements.</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <p>i Note</p> <p>Offer requirements are, for example:</p> <ul style="list-style-type: none"> ○ There must be at least one BUY term. ○ Multiple GET terms are not supported, regardless of the operator. ○ Product quantities cannot be zero or less. ○ AND BUY terms are not supported. ○ Multiple coupons at the offer level are not supported. ○ Coupons are not supported at the offer term level at all. ○ Duplicate product locations on the BUY side are not supported. ○ Duplicate product locations on the GET side are not supported. </div>

Analyze Forecast App: Investigate Forecast Issues

→ Tip

See also [Troubleshooting for Modeling and Forecasting \[page 300\]](#).

Workflow Example

A business user (such as a demand planner) reports an unaccountably high forecast for specific product locations. The too high forecast was used as the basis for a too high order proposal.

As the forecast analyst in the organization, you are asked to explain the forecast results and, if possible, optimize the configuration. Using the *Analyze Forecast* app, you drill down into the sales, modeling, and forecast data to investigate the issue.

Steps You Can Take

Rerun modeling and/or forecasting in diagnostic mode for the affected products and locations, with activated demand decomposition to break down the calculated results by demand influencing factor (DIF). For more information, see [Configure Demand Decomposition \[page 248\]](#).

Follow these steps:

1. In Customizing, define a diagnostic ID and a configuration ID for this analysis. Make sure that configuration ID has the demand decomposition activated for both modeling and forecasting.
 - You define diagnostic IDs under [Cross-Application Components](#) > [Demand Data Foundation](#) > [Modeling and Forecasting](#) > [Define Diagnostic IDs](#).

- You define configuration IDs under [Cross-Application Components](#) > [Demand Data Foundation](#) > [Modeling and Forecasting](#) > [Define Modeling Control Settings](#) (for modeling) and [Define Forecasting Control Settings](#) (for forecasting).

For more information, see the accompanying documentation of each activity.

2. Open the [Schedule Model and Forecast](#) screen in transaction NWBC.
3. Select the job that you wish to run ([Model By...](#), [Forecast By ...](#)).
4. Select the diagnostic ID and specify the configuration ID for this job.
5. Make the other settings as required and limit the run to the affected product locations.

→ Tip

You can save runtime and memory performance by generating analysis data only for the affected product locations.

To configure the amount of additional forecast data that should be calculated and persisted for your analysis, see [Optimize UDF Performance \[page 217\]](#).

6. Run the job.
7. View the results in the [Analyze Forecast](#) app to find out what caused the too high forecast. In particular, display the decomposition time series to detail out the results by demand influencing factor (DIF).

4.3.2 Configure Parameters for Modeling

Define additional parameters in the [Define Modeling Control Settings](#) Customizing activity to override system defaults for demand modeling and the calculation of hierarchical priors.

Prerequisites

- You are aware that these are advanced configurations that should only be done by experts (such as consultants, forecast analysts, or demand planners).
- Before configuring a parameter, you must be familiar with the UDF feature that is controlled by it. For information about the UDF features, see <https://help.sap.com/viewer/p/CARAB> <Version> > [Application Help](#) > [SAP Customer Activity Repository](#) > [Unified Demand Forecast](#).

How to Configure the Parameters

⚠ Caution

After you have changed the default of a parameter, first run modeling in diagnostic mode to verify the intended and, possibly, unintended effects this change might have. Only roll out the changed configuration to your productive system if you have a clear understanding of the effects and are satisfied with the results.

1. First set up the diagnostic mode:
Define a diagnostic ID for the configuration change that you wish to make.
 1. In Customizing (transaction SPRO), navigate to ► *Cross-Application Components* ► *Demand Data Foundation* ► *Modeling and Forecasting* ► *Define Diagnostic IDs* ►.
 2. Define a new diagnostic ID following the instructions in the Customizing activity documentation. For more information about using diagnostic IDs, see <https://help.sap.com/viewer/p/CARAB> ► *<Version>* ► *Application Help* ► *SAP Customer Activity Repository* ► *Unified Demand Forecast* ► *General Services* ► *Schedule Model and Forecast* ►.
 3. Save your changes.
2. Now configure the parameter:
Navigate to ► *Cross-Application Components* ► *Demand Data Foundation* ► *Modeling and Forecasting* ► *Define Modeling Control Settings* ► and execute the Customizing activity.
3. Choose *New Entries*.
4. Make the following settings:

Column	Setting
<i>Diag ID</i>	Enter the diagnostic ID that you have created in the first step. Later on, you use this ID in the <i>Schedule Model and Forecast</i> screen to run modeling in diagnostic mode and verify the changed configuration. Make sure that the ID is valid.
<i>Time Series Source</i>	Select a time series source.
<i>Config ID</i>	(Optional) Create a configuration ID for this run if you wish to use the changed configuration for only a subset of your assortment. Later on, you can use this ID in the <i>Schedule Model and Forecast</i> screen. Make sure that the ID is valid.

Column	Setting
<i>Configuration Type Code</i>	<p>Enter the parameter that you wish to change. Make sure that you enter the correct name (simply copy it from the table below).</p> <div data-bbox="751 421 1396 779" style="background-color: #f0f0f0; padding: 10px;"> <p>i Note</p> <p>There is no list of the parameters and their default values available in your ABAP system. UDF is designed in such a way that the default values are used automatically.</p> <p>You must manually enter the parameter name and its new value if you wish to change a default value as described below.</p> <p>Be aware that this applies to each diagnostic ID and each configuration ID separately.</p> </div> <div data-bbox="751 790 1396 1014" style="background-color: #f0f0f0; padding: 10px;"> <p>→ Remember</p> <p>The default values will be used in all other cases. This is also true for custom configurations that have errors (typos in parameter names, invalid values, invalid diagnostic IDs or configuration IDs).</p> </div>
<i>Configuration Value</i>	<p>Specify a new value for the parameter to override the default. Use the table below for reference and make sure that you enter a valid value.</p> <div data-bbox="751 1167 1396 1317" style="background-color: #f0f0f0; padding: 10px;"> <p>i Note</p> <p>We recommend that you adopt a conservative approach when changing the default.</p> </div>

5. Save your changes.
6. Verify the changed configuration:
 1. In transaction `NWBC`, open the *Schedule Model and Forecast* screen.
 2. Execute modeling in diagnostic mode, specifying the diagnostic ID and, if applicable, the configuration ID created above.
 3. Analyze the results. Do additional diagnostic runs if required and thoroughly test the changed configuration.
 4. If you have a clear understanding of the effects and are satisfied with the results, roll out the changed configuration to your productive system.

Parameters for Modeling

You can override the modeling defaults by specifying new values for the following parameters:

i Note

' ' denotes a space character.

Parameters for Modeling

Parameter	Default	Value Range	Description
MD_SWITCH_OFF_MANAGE_USER_DIF	''	'' = ON (default) 'X' = OFF	<p>Controls the handling of user DIFs configured in the <i>Manage Demand Influencing Factors</i> app:</p> <ul style="list-style-type: none"> '': User DIFs configured in the app are sent to UDF so they can be considered in modeling and forecasting. 'X': User DIFs configured in the app are not sent to UDF.
MOD_COV_OBS_WT_MODE	0	0 (default) 1	<p>Controls how the covariance matrix is calculated:</p> <ul style="list-style-type: none"> 0: Flat weight of 1 1: Estimated sales weight (the calculation is weighted by the absolute sales value)
MOD_COV_REDUCED	''	'' = OFF (default) 'X' = ON	<p>Controls whether the full (OFF) or the reduced (ON) covariance matrix should be calculated.</p> <ul style="list-style-type: none"> OFF: Mandatory for calculating the forecast confidence index (FCI) in SAP Promotion Management. ON: Saves runtime. Only the diagonal elements of the covariance matrix are returned. This setting is ok for nearly all scenarios (such as calculating hierarchical priors, HPRs). <p>To calculate either the full or the reduced covariance matrix, parameter MOD_OUTPUT_COV must also be enabled (which it is by default).</p>
MOD_DAYS_IN_PERIOD	0	0 <= x <= 9999	<p>Defines the maximum number of days of the modeling period.</p> <ul style="list-style-type: none"> 0: The complete available sales history is considered. Recommendation for a productive environment: 770 to 798, if 110 to 114 weeks of history should be considered.

Parameter	Default	Value Range	Description
MOD_HDM_NEAR_HOLIDAY_D ENSITY	0.75	0.5 <= x < 1.0	<p>Controls how the effect of a holiday on the demand is modeled (in the period leading up to the holiday and in the period after the holiday):</p> <p>Defines a quantile to determine the proportion of the effect to the right (pre-holiday effect) or to the left (post-holiday effect) of the half-way date. For example, having 80% of the effect to the right of the half-way date results in a steeper ramp-up than with 70%.</p> <p>The value is considered in modeling and in forecasting.</p>
MOD_INFER_ZERO_SALES	X	'X' = ON (default) '' = OFF	<p>Controls the "zero sales inferencing" during the preprocessing of the historical sales data.</p> <p>ON (recommended): Fills gaps in the historical sales data with zeros to improve the accuracy of the modeling results. For example, enable this parameter if days with no sales should be considered as zero sales in the model and should not be ignored.</p>
MOD_MAX_NUM_CANN_DRIVE RS	5	0 <= x <= 99	<p>Maximum number of drivers selected for each negative drag product submitted to modeling. This configuration is also used in forecasting.</p>
MOD_OOSD_MIN_LEN	1	x >= 1	<p>Controls the out-of-stock detection during preprocessing:</p> <p>Defines the minimum number of zero sales that must occur in a row, in order for the system to consider this a potential out-of-stock situation.</p> <p>This parameter is only considered if MOD_OOSD_THRSHLD > 0.</p> <p>Example: For an ultra-slow seller a value of 7 days might still be too low, even with a very low probability.</p>

Parameter	Default	Value Range	Description
MOD_OOSD_THRSHLD	0.005	0.0 <= x <= 1.0	<p>Controls the out-of-stock detection during preprocessing:</p> <p>Calculates a probability value for each occurrence of zero sales in a period that is longer than MOD_OOSD_MIN_LEN. If at least one probability value within such a period is less than the value of this parameter, the zero sales of that period are considered as out-of-stocks.</p> <p>To disable the out-of-stock detection, set this parameter to 0.000.</p>
MOD_OUTLIER_DETECTION	X	<p>'X' = ON (default, recommended)</p> <p>' ' = OFF</p>	<p>Controls the outlier detection during the preprocessing of the historical sales data.</p> <p>An observation is flagged as an outlier if 2 conditions are met.</p> <ol style="list-style-type: none"> 1. The time series must contain a minimum number (MOD_OUTLIER_MIN_LEN) of non-zero sales observations. 2. An individual observation is flagged if the sales value exceeds a threshold computed by this formula: (mean of observations) * factor1 + (standard deviation of observations) * factor2. Factor1 is MOD_OUTLIER_MEAN_FACTOR and factor2 is MOD_OUTLIER_STD_DEV_FACTOR. <p>We recommend that you keep the default.</p>
MOD_OUTLIER_MEAN_FACTOR	1	A sales observation is considered an outlier if there are $ax \geq 1.0$	<p>Additional parameter for the outlier detection.</p> <p>Defines how far sales values can deviate from the mean before they are considered outliers.</p> <p>The parameter defines a multiplier that is applied to the average unit sales to calculate a threshold. Sales values beyond this threshold are considered outliers.</p>
MOD_OUTLIER_MIN_LEN	6	$x \geq 3.0$	<p>Additional parameter for the outlier detection.</p> <p>Defines the minimum number of non-zero sales observations that must occur (regular sales and/or promotional sales).</p> <p>The minimum number is counted before zero sales inferencing takes place during preprocessing.</p>

Parameter	Default	Value Range	Description
MOD_OUTLIER_STD_DEV_FACTOR	10	x >= 0.0	<p>Additional parameter for the outlier detection.</p> <p>Defines a multiplier that is applied to the standard deviation of the unit sales to calculate a threshold. Sales values beyond this threshold are considered outliers.</p>
MOD_OUTPUT_COV	X	'X' = ON (default) '' = OFF	<p>Controls the calculation of the covariance matrix.</p> <p>To calculate the covariance matrix, enable the parameter.</p> <p>Additionally, use parameter MOD_COV_REDUCED to control whether to calculate the full or the reduced covariance matrix.</p> <p>For example, the full covariance matrix is required for calculating FCIs (see Configure Forecast Confidence Index (FCI) [page 251]), whereas the reduced covariance matrix is sufficient for hierarchical priors (see Configure Hierarchical Priors (HPRs) [page 226]).</p>
MOD_OUTPUT_DECOMP	''	'' = OFF (default) 'X' = ON	<p>Controls the demand decomposition during modeling.</p> <p>Enable the parameter if you wish to generate the decomposition time series (table /DMF/UMD_TSD).</p> <p>This time series details out unit movement by demand influencing factor (DIF). However, be aware that the demand decomposition is performance-intensive. Depending on the scope of your business, it can create a large data set, and the original hardware sizing needs to be taken into account.</p> <p>Enable this parameter mainly for support and troubleshooting purposes. Use a diagnostic ID and generate the decomposition time series only for the affected products whose modeling results you wish to analyze.</p> <p>When the parameter is disabled, no records are written to the /DMF/UMD_TSD table.</p> <p>For more information about the demand decomposition, see Configure Demand Decomposition [page 248].</p>

Parameter	Default	Value Range	Description
MOD_OUTPUT_OBS_VAR	X	'X' = ON (default) '' = OFF	Controls the calculation and output of the observation time series variances. You must disable the parameter to run modeling on historical sales data at weekly level (Schedule Model and Forecast > Time Granularity > Week >).
MOD_OUTPUT_TS	X	'X' = ON (default) '' = OFF	Controls the calculation and output of the model fit and tracing information in the /DMF/UMD_TS table. <div style="background-color: #f0f0f0; padding: 5px; border: 1px solid #ccc;"> <p>→ Tip</p> <p>Consider disabling the parameter for productive runs where you are mostly interested in the forecast results.</p> </div>
MOD_SCALE_OOS_PCT_UPPER_BOUND	75	0 <= x <= 100	The OOS_PCT field in the POS time series (table /DMF/TS_PS) defines the percentage of the time period (day or week) in which the product was out of stock. 0 = In stock all day (week) 100 = Out of stock all day (week) This parameter acts as a maximum threshold for the intraday out-of-stock functionality to execute. When the OOS_PCT value is above the configured parameter value, the product will not be considered by modeling.
MOD_SCALE_UNITS_USING_OOS_PCT	X	'' = OFF 'X' = ON (default)	Controls whether sales is scaled by out-of-stock percent.
MOD_SQL_RETRY_MAX	0	0 <= x <= 3	Controls the maximum number of retries after a modeling job has failed. The system will retry to execute the job this many times before giving a timeout.
MOD_SQL_RETRY_TIMEOUT	0	0 <= x <= 30	Controls the waiting time in seconds before the system retries to execute a failed modeling job.

Parameter	Default	Value Range	Description
MOD_SWITCH_OFF_MANAGED _USER_DIF	' '	' ' = OFF (default) 'X' = ON	<p>Controls if DIFs added using the <i>Manage Demand Influencing Factors</i> app will be included</p> <p>A value of 'X' means UDF will not read the DIFs entered using the <i>Manage Demand Influencing Factors</i> app. The default value of ' ' will result in those DIFs being read.</p> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p>i Note</p> <p>Imported user DIFs are always included.</p> </div>

Parameter	Default	Value Range	Description
MOD_TD_ERROR_VARIANCE	''	' ' = OFF (default) 'X' = ON	Controls the calculation and output of time-dependent error variances for modeling: Time-dependent error variances are observed differences between the actual historical sales and the modeled sales. The variances can be forecasted based on a modeling of the errors. The time granularity can be daily, for example.

i Note

Integration Scenario between UDF and SAP Forecasting and Replenishment

In this scenario, you use the RFC-enabled function module `/DMF/`

`UFC_RETRIEVE_RESULTS_FR` to retrieve the UDF forecasts into SAP Forecasting and Replenishment. Note that you can also retrieve the time-dependent variances, but that you must first explicitly enable their usage in SAP F&R. Follow the instructions in the following SAP Notes:

- [2613998](#) - UDF Forecast in F&R: Consideration of Daily Variances (Functionality)
- [2614098](#) - UDF Forecast in F&R: Consideration of Daily Variances (Customizing Screen)
- [2616091](#) - UDF Forecast in F&R: Consideration of Daily Variances (Consulting)

In SAP F&R, the time-dependent error variances can be used to calculate safety amounts to improve forecasts during, for example, weekends, promotions or high seasons.

For more information about this integration scenario, see the *Provide Demand Forecasts to External System* section in the *SAP Customer Activity Repository Application Help*.

Parameter	Default	Value Range	Description
MOD_TIME_WEIGHT	0.5	0.00001 <= x <= 1.0	<p>Factor controlling the weighting of older sales observations against newer sales observations.</p> <p>The assumption is that older observations should be weighted less heavily because they are not as relevant to the current demand as newer observations.</p> <p>Example: A sales value dating from one year ago is weighted with this factor compared to a sales value dating from today.</p> <p>To disable time weighting for all observations, set the parameter to 1.</p>
MOD_TIME_WEIGHT_MIN	0.1	0.0 <= x <= 1.0	<p>Defines a minimum factor below which the time weighting factor must not fall. This ensures that the Christmas sales from two years ago are not ignored if MOD_TIME_WEIGHT is set to a very low value.</p>
MOD_USE_PRODLOC_LSTNG	''	<p>' ' = OFF (default)</p> <p>'X' = ON</p>	<p>Controls whether to consider product listing information in modeling.</p> <ul style="list-style-type: none"> ' ' (default, OFF): Modeling considers all sales values, regardless of whether the product location was listed or not. X (ON): Modeling ignores the sales of those days when the product location was not listed. <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>⚠ Caution</p> <p>To be able to consider listing information, you must first replicate this data from the source master data system into DDF.</p> <p>If you enable the parameter but the listing data is not available in DDF, the product location is considered as not listed.</p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>i Note</p> <p>You can consider listing information also in forecasting. See the FC_USE_PRODLOC_LSTNG parameter in Configure Parameters for Forecasting [page 206].</p> </div>

Parameter	Default	Value Range	Description
MOD_EXCLUDE_FUTURE_SALES	''	' ' = OFF (default) 'X' = ON	<p>Controls whether future sales records in the time series source should be excluded from modeling if no model end date is specified in the <i>Schedule Model and Forecast</i> service.</p> <ul style="list-style-type: none"> ' ' (default, OFF): Modeling considers all sales records in the time series source, no matter if they are in the past or the future. X (ON): Modeling considers only sales records up to the current date. Future records (such as future sales orders) are excluded. <p>This parameter can be used with all the time series sources that are supported for modeling and forecasting.</p>
MOD_OUTPUT_DBG_DATA	''	' ' = OFF (default) 'X' = ON	<p>Controls whether the design matrix for modeling is generated and persisted in the /DMF/UMD_DS_MTRX table.</p> <p>The design matrix allows you to trace DIF-related calculations in the UDF application function library (AFL), for analyses and troubleshooting purposes.</p> <p>To generate and persist the design matrix, enable this parameter together with the MOD_MAX_PRODLOC_DESIGN_MATRIX parameter (where you specify the desired maximum number of products).</p> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 10px; margin-top: 10px;"> <p>→ Tip</p> <p>If you have obsolete design matrixes that you no longer need, you can delete this data using the /DMF/TS_DELETE report in transaction SE38. For more information, see the accompanying system documentation.</p> </div>
MOD_MAX_PRODLOC_DESIGN_MATRIX	10	1 <= x <= 9999	<p>Defines the maximum number of products to be written to the design matrix for modeling.</p> <p>Additionally, enable the MOD_OUTPUT_DBG_DATA parameter so that the design matrix is generated at all and is persisted in the /DMF/UMD_DS_MTRX table.</p>

Parameter	Default	Value Range	Description
MOD_EXCL_DISCOUNTED_SALES	0	[0 1 2 3]	<p>Controls whether to exclude specific sales types from the input for modeling (only for historical point-of-sale data, time series source POS_TS):</p> <ul style="list-style-type: none"> • 0: Include markdown sales and clearance sales (default). • 1: Include markdown sales. Exclude clearance sales. • 2: Exclude markdown sales. Include clearance sales. • 3: Exclude markdown sales and clearance sales. <p>As markdown sales and clearance sales were made at discount prices, their volumes are not typical of the sales history. By excluding them, you can improve the input for modeling, which in turn benefits forecast accuracy.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>i Note</p> <p>This parameter is only available for historical POS data (time series source POS_TS, table /DMF/TS_PS). The data can be at daily or weekly level. Non-aggregated data, aggregation profile 0001, and aggregation profile 0002 are all supported.</p> </div> <p>Depending on the parameter setting, modeling ignores the corresponding sales records in /DMF/TS_PS based on their price type code (field PRC_TCD):</p> <ul style="list-style-type: none"> • markdown sales (price type code 06) • clearance sales (price type code 07) <div style="background-color: #f0f0f0; padding: 5px;"> <p>i Note</p> <p>For a list of all available price type codes, execute transaction SE80, search for the domain PRC_TCD, and see the value range.</p> </div>

4.3.3 Configure Parameters for Forecasting

Define additional parameters in the *Define Forecasting Control Settings* Customizing activity to override system defaults for demand forecasting.

Prerequisites

- You are aware that these are advanced configurations that should only be done by experts (such as consultants, forecast analysts, or demand planners).
- Before configuring a parameter, you must be familiar with the UDF feature that is controlled by it. For information about the UDF features, see <https://help.sap.com/viewer/p/CARAB> **▮** <Version> **▮** *Application Help* **▮** *SAP Customer Activity Repository* **▮** *Unified Demand Forecast* **▮**.

How to Configure the Parameters

⚠ Caution

After you have changed the default of a parameter, first run forecasting in diagnostic mode to verify the intended and, possibly, unintended effects this change might have. Only roll out the changed configuration to your productive system if you have a clear understanding of the effects and are satisfied with the results.

1. First set up the diagnostic mode:
Define a diagnostic ID for the configuration change that you wish to make.
 1. In Customizing (transaction SPRO), navigate to **▮** *Cross-Application Components* **▮** *Demand Data Foundation* **▮** *Modeling and Forecasting* **▮** *Define Diagnostic IDs* **▮**.
 2. Define a new diagnostic ID following the instructions in the Customizing activity documentation. For more information about using diagnostic IDs, see <https://help.sap.com/viewer/p/CARAB> **▮** <Version> **▮** *Application Help* **▮** *SAP Customer Activity Repository* **▮** *Unified Demand Forecast* **▮** *General Services* **▮** *Schedule Model and Forecast* **▮**.
 3. Save your changes.
2. Now configure the parameter:
Navigate to **▮** *Cross-Application Components* **▮** *Demand Data Foundation* **▮** *Modeling and Forecasting* **▮** *Define Forecasting Control Settings* **▮** and execute the Customizing activity.
3. Choose *New Entries*.

4. Make the following settings:

Column	Setting
<i>Diag ID</i>	<p>Enter the diagnostic ID that you have created in the first step.</p> <p>Later on, you use this ID in the <i>Schedule Model and Forecast</i> screen to run forecasting in diagnostic mode and verify the changed configuration. Make sure that the ID is valid.</p>
<i>Time Series Source</i>	Select a time series source.
<i>Config ID</i>	<p>(Optional) Create a configuration ID for this run if you wish to use the changed configuration for only a subset of your assortment.</p> <p>Later on, you can use this ID in the <i>Schedule Model and Forecast</i> screen. Make sure that the ID is valid.</p>

<i>Configuration Type Code</i>	Enter the parameter that you wish to change. Make sure that you enter the correct name (simply copy it from the table below).
--------------------------------	--

i Note

There is no list of the parameters and their default values available in your ABAP system. UDF is designed in such a way that the default values are used automatically.

You must manually enter the parameter name and its new value if you wish to change a default value as described below.

Be aware that this applies to each diagnostic ID and each configuration ID separately.

→ Remember

The default values will be used in all other cases. This is also true for custom configurations that have errors (typos in parameter names, invalid values, invalid diagnostic IDs or configuration IDs).

Column	Setting
<i>Configuration Value</i>	Specify a new value for the parameter to override the default. Use the table below for reference and make sure that you enter a valid value .

i Note

We recommend that you adopt a conservative approach when changing the default.

5. Save your changes.
6. Verify the changed configuration:
 1. In transaction NWBC, open the *Schedule Model and Forecast* screen.
 2. Execute forecasting in diagnostic mode, specifying the diagnostic ID and, if applicable, the configuration ID created above.
 3. Analyze the results. Do additional diagnostic runs if required and thoroughly test the changed configuration.
 4. If you have a clear understanding of the effects and are satisfied with the results, roll out the changed configuration to your productive system.

Parameters for Forecasting

You can override the forecasting defaults by specifying new values for the following parameters:

i Note

' ' denotes a space character.

Parameters for Forecasting

Parameter	Default	Value Range	Description
FC_FCI_MSE_WGT	0	x >= 0.0	<p>FCI-specific:</p> <p>Defines how the forecast confidence index (FCI) is calculated for SAP Promotion Management and the production forecast (table /DMF/UFC_TS).</p> <p>Product locations with a high residual variance between historical sales values will have a lower FCI than product locations whose sales can be more readily explained.</p> <p>The parameter defines how much weight to give to the remaining uncertainties (mean square error, MSE).</p> <ul style="list-style-type: none"> • 0.0: The MSE is not considered. The FCI is influenced only by the covariance matrix. The FCI is expected to be in the range of 0 to 1, depending on past and future demand influencing factors (DIFs). • > 0.0: The higher the weight, the smaller the relative influence of the covariance matrix. The FCI is still expected to be in the range of 0 to 1. The higher the weight, the more the FCI tends towards 0. • -1 or X or an invalid value: The system ignores the setting and uses the default. A message is raised. <div style="border: 1px solid #0070C0; padding: 5px; margin-top: 10px;"> <p>i Note</p> <p>The FCI-specific parameters (see also the following) only control the calculation of the FCI. They have no influence on the forecast.</p> <p>The calculation of the FCI requires that the full covariance matrix is generated in modeling (see modeling parameter MOD_COV_REDUCED).</p> <p>The FCI is calculated in the following cases:</p> <ul style="list-style-type: none"> • if requested by SAP Promotion Management • in the production forecast (the results are persisted in the /DMF/UFC_TS table) </div>
FC_FCI_RSN_HIST_LEN	28	x >= 0	<p>FCI-specific:</p> <p>Defines the maximum number of observations for the reason <i>Low FCI: limited sales history</i>.</p> <div style="border: 1px solid #0070C0; padding: 5px; margin-top: 10px;"> <p>i Note</p> <p>The reason for a low FCI result is only displayed in SAP Promotion Management.</p> </div>

Parameter	Default	Value Range	Description
FC_FCI_RSN_LOW_DMD	0.1	$x \geq 0.0$	<p>FCI-specific:</p> <p>Defines the maximum average historical demand for the "Low FCI" reason <i>Forecast is based on low average historical demand</i>.</p>
FC_FCI_RSN_MAX	2	$x \geq 0$	<p>FCI-specific:</p> <p>Defines the maximum number of "low FCI" reasons to output.</p>
FC_HZN_DUR_DAYS	7	$1 \leq X \leq 730$	<p>Defines the length of the forecast horizon in days.</p> <p>Check how long the forecast horizon needs to be for your scenario and configure it accordingly. It is also possible to configure longer/shorter forecast horizons only for specific products. Keep in mind that the forecast horizon has a considerable impact on runtime performance and sizing.</p> <div style="border: 1px solid #0070C0; padding: 5px; margin-top: 10px;"> <p>i Note</p> <p>If the forecast horizon in the <i>Schedule Model and Forecast</i> service is not adjusted and not set to 000, this value is used as the default instead.</p> </div>
FC_OUTPUT_DECOMP	X	'X' = ON (default) '' = OFF	<p>Controls the demand decomposition during forecasting.</p> <p>Enable the parameter if you wish to generate the decomposition time series (table /DMF/UFC_TSD).</p> <p>This time series details out unit movement by demand influencing factor (DIF). However, be aware that the demand decomposition is performance-intensive. Depending on the scope of your business, it can create a large data set, and the original hardware sizing needs to be taken into account.</p> <p>Enable this parameter mainly for support and troubleshooting purposes. Use a diagnostic ID and generate the decomposition time series only for the affected products whose forecasting results you wish to analyze.</p> <p>When the parameter is disabled, no records are written to the /DMF/UFC_TSD table.</p> <p>For more information about the demand decomposition, see Configure Demand Decomposition [page 248].</p>

Parameter	Default	Value Range	Description
FC_OUTPUT_FCI	P	'X' = ON ' ' = OFF 'P' = partially ON (default)	<p>FCI-specific:</p> <p>Controls the calculation of the forecast confidence index (FCI), the generation of the FCI decomposition time series, and the determination of reasons for a low FCI.</p> <ul style="list-style-type: none"> • ON: <ol style="list-style-type: none"> 1. FCI values are calculated, persisted in the <code>/DMF/UFC_TS</code> table, and transferred back to SAP Promotion Management (<i>Manage Promotional Offers</i> app). Reasons for low FCI values are also calculated. 2. The FCI decomposition time series is generated and also transferred back to SAP Promotion Management (<i>Manage Promotional Offers</i> app). Note that this time series is not persisted in any table, but is only available in SAP Promotion Management. 3. The percentage values for the FCI decomposition time series are written to the <code>/DMF/UFCI_DECOMP</code> table. • OFF: Points 1, 2, 3 above are all disabled. • P: Points 1 and 2 above are enabled. Point 3 is disabled.

→ Tip

Check that you have configured the appropriate level of FCI data to be output. For scenarios using the FCI, we recommend setting the parameter to 'P' (partially ON). This means you get the following output data: FCI values between 0 and 1, FCI reasons, FCI decomposition time series; however, no FCI*_PCT fields are calculated or output.

Parameter	Default	Value Range	Description
FC_OUTPUT_TRACE	''	' ' = OFF (default) 'X' = ON	<p>Controls the output of additional tracing information (for example, product prices, product listings, closed days of locations).</p> <p>The output is written to the <code>/DMF/UFC_TRC</code> table.</p> <p>Some of this information is used by the Analyze Forecast app (for example, to display future prices).</p> <div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p>→ Tip</p> <p>Consider disabling the parameter for productive runs where you are mostly interested in the forecast results.</p> </div>
FC_PREVENT_UNDERDISPERSION	1.0	0.0 <= x <= 1.0	<p>Only relevant for the calculation of time-dependent error variances:</p> <p>Prevents the underdispersion of error variances (that is, lower variances than sales forecast values). For this, the variance forecasts are treated with a maximum rule, taking sales values into account.</p> <p>This leads to higher variances in cases of low sales fluctuations. The parameter controls the effect of this maximum rule:</p> <pre>variance_forecast = max{intermediate_variance_forecast, FC_PREVENT_UNDERDISPERSION * sales_forecast}</pre> <ul style="list-style-type: none"> • 0: The estimated variance forecasts are used. • 1: The maximum rule is applied. <p>This means, the variance forecast is at least as high as the mean forecast. This is especially relevant for newly listed products.</p> <div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p>→ Tip</p> <p>We recommend that you do not change the parameter. The underdispersion of error variances is usually not desired; except, possibly, in cases where you might have very stable sales for a fast selling product (such as a standard dairy product).</p> </div>

Parameter	Default	Value Range	Description
FC_SQL_RETRY_MAX	0	0 <= x <= 3	<p>Controls the maximum number of retries after a forecasting job has failed.</p> <p>The system will retry to execute the job this many times before giving a timeout.</p>
FC_SQL_RETRY_TIMEOUT	0	0 <= x <= 30	<p>Controls the waiting time in seconds before the system retries to execute a failed forecasting job.</p>
FC_SWITCH_OFF_MANAGE_D_USER_DIF	''	' ' = OFF (default) 'X' = ON	<p>Controls if DIFs added using the <i>Manage Demand Influencing Factors</i> app will be included</p> <p>A value of 'X' means UDF will not read the DIFs entered using the <i>Manage Demand Influencing Factors</i> app. The default value of '' will result in those DIFs being read.</p> <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p>i Note</p> <p>Imported user DIFs are always included.</p> </div>
FC_TASK_DECOMP_STYLE	TASK_SIZE	CHECK_OFFERS TASK_SIZE (default)	<p>Defines what algorithm to use for the task decomposition (load balancing) in forecasting.</p> <ul style="list-style-type: none"> CHECK_OFFERS: Use this setting to forecast complex offers (such as Buy X Get Y). It ensures that all products in a complex offer are forecasted in the same task. <ul style="list-style-type: none"> The product locations not included in any offers during the forecast horizon are grouped into one bucket. The task size is controlled by the <i>Num Records</i> value set in the <i>Configure Load Balancing</i> service in transaction NWBC. The product locations that are included in offers during the forecast horizon are grouped into tasks by product-location-multichannel, so that the products are kept together across locations. TASK_SIZE: The task size is exclusively controlled by the <i>Num Records</i> value set in the <i>Configure Load Balancing</i> service in transaction NWBC. Offers are not considered.

Parameter	Default	Value Range	Description
FC_TD_ERROR_VARIANCE	''	'' = OFF (default) 'X' = ON	<p>Controls the calculation and output of time-dependent error variances for forecasting.</p> <p>If you enable this parameter for forecasting, you must also enable the corresponding parameter for modeling (MOD_TD_ERROR_VARIANCE).</p> <div style="border: 1px solid #ccc; padding: 10px; background-color: #f9f9f9;"> <p>i Note</p> <p>Integration Scenario between UDF and SAP Forecasting and Replenishment</p> <p>In this scenario, you use the RFC-enabled function module <code>/DMF/UFC_RETRIEVE_RESULTS_FR</code> to retrieve the UDF forecasts into SAP Forecasting and Replenishment. Note that you can also retrieve the time-dependent variances, but that you must first explicitly enable their usage in SAP F&R. Follow the instructions in the following SAP Notes:</p> <ul style="list-style-type: none"> • 2613998 - UDF Forecast in F&R: Consideration of Daily Variances (Functionality) • 2614098 - UDF Forecast in F&R: Consideration of Daily Variances (Customizing Screen) • 2616091 - UDF Forecast in F&R: Consideration of Daily Variances (Consulting) <p>In SAP F&R, the time-dependent error variances can be used to calculate safety amounts to improve forecasts during, for example, weekends, promotions or high seasons.</p> <p>For more information about this integration scenario, see the <i>Provide Demand Forecasts to External System</i> section in the <i>SAP Customer Activity Repository Application Help</i>.</p> </div>

Parameter	Default	Value Range	Description
FC_TO_LOW_QUAL_IDX	0.01	x >= 0.0	<p>FCI-specific:</p> <p>Defines a threshold for what constitutes a low forecast confidence index (FCI). The parameter is used to determine the reasons for low FCIs.</p> <div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p>→ Tip</p> <p>Rather than changing this parameter, define value ranges for low, medium, and high FCIs in the following Customizing activity:</p> <p>▶ Cross-Application Components ▶ Demand Data Foundation ▶ Modeling and Forecasting ▶ Define Categories for Forecast Confidence Index ▶</p> </div>

Parameter	Default	Value Range	Description
FC_TREND_DAMP	100	x >= 0.0	<p>Defines the dampening factor for the trend DIF.</p> <p>The (fitted) trend should be extrapolated to reach no more than p times its historical increase or decrease. The parameter defines the percentage of historical increase or decrease. That is, the maximum influence of the trend is not only due to the configured dampening factor, but is also based on the available history.</p> <p>Examples (n is the parameter value):</p> <ul style="list-style-type: none"> • A product location has 2 months of history and a detected trend value of +2 during this time. The trend will be dampened to n% of +2. A parameter value of 100 means that the trend will be dampened to a maximum of +2. A parameter value 1000 means that the trend will be dampened to a maximum of +20. • A product location has 2 years of history and a detected trend value of +2 every two months (that is, +24 for the history in total). The trend will be dampened to n% of +24. A parameter value of 100 means that the trend will be dampened to a maximum of +24. A parameter value 1000 means that the trend will be dampened to a maximum of +240. <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p>→ Tip</p> <p>Do not set the parameter higher than 100. The influence of the trend in forecasting is calculated in such a way that it cannot surpass the influence of the trend observed in the past.</p> </div>
FC_USE_PRODLOC_LSTNG	'X'	'X' = ON (default) '' = OFF	<p>Controls whether to consider future product listing information in forecasting.</p> <ul style="list-style-type: none"> • X (default, ON): The forecast is set to 0 for every day that the product location is not listed. • '' (OFF): The forecast is generated also for days when the product location is not listed. <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p>i Note</p> <p>You can consider listing information also in modeling. See the MOD_USE_PRODLOC_LSTNG parameter in Configure Parameters for Modeling [page 193].</p> </div>

Parameter	Default	Value Range	Description
MOD_HDM_NEAR_HOLIDAY _DENSITY			<p>Note</p> <p>This modeling parameter is considered in both modeling and forecasting. For details, see Configure Parameters for Modeling [page 193].</p>
FC_OUTPUT_DBG_DATA	''	'' = OFF (default) 'X' = ON	<p>Controls whether the design matrix for forecasting is generated and persisted in the /DMF/UFC_DS_MTRX table.</p> <p>The design matrix allows you to trace DIF-related calculations in the UDF application function library (AFL), for analyses and troubleshooting purposes.</p> <p>To generate and persist the design matrix, enable this parameter together with the FC_MAX_PRODLOC_DESIGN_MATRIX parameter (where you specify the desired maximum number of products).</p> <p>Tip</p> <p>If you have obsolete design matrixes that you no longer need, you can delete this data using the /DMF/TS_DELETE report in transaction SE38. For more information, see the accompanying system documentation.</p>
FC_MAX_PRODLOC_DESIG N_MATRIX	10	1 <= x <= 9999	<p>Defines the maximum number of products to be written to the design matrix for forecasting.</p> <p>Additionally, enable the FC_OUTPUT_DBG_DATA parameter so that the design matrix is generated at all and is persisted in the /DMF/UFC_DS_MTRX table.</p>

4.3.4 Optimize UDF Performance

Get recommendations on how to optimize modeling and forecasting with Unified Demand Forecast for different scenarios. As the UDF application function library (UDF AFL) runs directly in the SAP HANA database, performance considerations for SAP HANA are also relevant, and included here.

Check SAP Notes for Latest Performance Corrections

Since your version of SAP Customer Activity Repository applications bundle was released, new performance enhancements and corrections might have become available.

For up-to-date information, navigate to SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> and select your version from the dropdown. Then see the following:

- Under *Installation and Upgrade*, see the two release information notes (RINs). The RINs are release-specific. There is always one RIN listing the latest back-end corrections, and one RIN listing the latest front-end corrections.
- Under *Performance*, see the overall performance note for SAP Customer Activity Repository applications bundle (available as of version 4.0 FPS02).

Install Newest AFL Patch (Component SAP RTL AFL FOR SAP HANA)

The UDF application function library is delivered in software component SAP RTL AFL FOR SAP HANA and runs directly in the SAP HANA database. Check if a new patch of the component is available on the SAP Support Portal. If so, install it in your SAP HANA system.

i Note

The revision of SAP RTL AFL FOR SAP HANA must always be compatible with the revision the SAP HANA database. Within the same revision, however, you can still upgrade the AFL to a **newer patch**.

Example:






- Your current revision of SAP RTL AFL FOR SAP HANA is:
Revision 37.200 for SAP HANA Platform 2.0 SPS03 Revision 37.02
- A new patch of SAP RTL AFL FOR SAP HANA might be:
Revision 37.201 for SAP HANA Platform 2.0 SPS03 Revision 37.02

For download and installation instructions, see the *Download and Install the Application Function Library (SAP RTL AFL FOR SAP HANA)* section in the *Common Installation Guide*.

Optimize SAP HANA Performance

The UDF application function library is delivered in software component SAP RTL AFL FOR SAP HANA and runs directly in the SAP HANA database.

Optimizing the performance of your SAP HANA system is therefore also of interest for the modeling and forecasting processes. For performance recommendations for SAP HANA, see the following references and also read the next section about SAP HANA workload management:

- SAP Note [2600030](#)  (*Parameter Recommendations in SAP HANA Environments*)
- SAP Note [2100040](#)  (*FAQ: SAP HANA CPU*)
- SAP Note [1999997](#)  (*FAQ: SAP HANA Memory*)
- *SAP HANA Troubleshooting and Performance Analysis Guide* for your SAP HANA Platform version under https://help.sap.com/viewer/p/SAP_HANA_PLATFORM  *Administration* 

Configure SAP HANA Workload Management (Recommended)

We highly recommend that you use SAP HANA workload management to control how many system resources should be assigned to modeling and forecasting with UDF.

This is an important measure to ensure the stability of your system. Without workload management, SAP HANA can use so many resources (CPU and memory) that your system may become unresponsive when running load-intensive jobs (such as modeling and forecasting).

- For configuration information, see SAP Note [2222250](#) (FAQ: SAP HANA Workload Management). In particular, read the following sections:
 - *4. How can workload management be configured for memory?*
 - *5. How can workload management be configured for CPU and threads?*
 - *8. How can workload classes be mapped to users and applications?*
- Section *Workload Management* at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM under [Administration](#) > [SAP HANA Administration Guide for SAP HANA Platform](#)

Benefits for Modeling and Forecasting

- UDF can utilize all system resources until the limit that you define.
- You can increase the *Num Records* and *Max Num Processes* settings for UDF in the *Configure Load Balancing* service, without jeopardizing the processes of other critical applications running on the same SAP HANA system. For more information about this service, see the next section.

Optimize Load Balancing

In the *Configure Load Balancing* service (in transaction `NWBC` under *Services*), you can optimize the settings of the *Num Records* and *Max Num Processes* parameters for different processes:

- demand modeling
- demand forecasting (only production forecasts; not possible for what-if forecasts)
- calculation of hierarchical priors

For more information, see section *Considerations for Demand Modeling and Forecasting* under <https://help.sap.com/viewer/p/CARAB> > [<Version>](#) > [Application Help](#) > [SAP Customer Activity Repository](#) > [Demand Data Foundation](#) > [General Services](#) > [Configure Load Balancing](#).

Optimize Table Partitioning and System Sizing for Your Scenario

Partitioning recommendations for modeling and forecasting are available for single-host systems and multiple-host systems. To help you with the partitioning decisions, also consult the sizing information for your solution. For example, check the number of records estimated for the large tables to decide which tables to partition and how many partitions you need.

For more information, see [Partition Tables for UDF and DDF \[page 225\]](#) in this guide.

Delete Obsolete Master Data

Keep your system slim by regularly removing obsolete master data records from the database:

Use the `/DMF/PURGE_AGENT` report in transaction `SE38` or the *Where Used Framework for Purging* service in transaction `NWBC`. For prerequisites, instructions, and information on the data that can be purged, see <https://help.sap.com/viewer/p/CARAB> **|** [<Version>](#) **|** [Application Help](#) **|** [SAP Customer Activity Repository](#) **|** [Demand Data Foundation](#) **|** [General Services](#) **|** [Purge Master Data](#) **|** [>](#).

Delete Obsolete Transactional Data (Times Series and More)

Use the `/DMF/TS_DELETE` report (transaction `SE38`) to delete (purge) various types of data that you no longer need. For example, you can delete modeling data and forecast data (including the design matrix tables), time series data, orphaned data, or wholesale data.

For more information, see the accompanying system documentation.

→ Tip

We recommend that you schedule the report to run on a regular basis (transaction `SM36`).

Delete Obsolete Exception Messages

Keep your system slim by regularly removing exception message data that you no longer need. Different options are available:

- Use the `/DMF/PURGE_EWB_MESSAGES` report in transaction `SE38` or the *Purging Exceptions From the Database* service in transaction `NWBC`. For prerequisites, instructions, and information on the data that can be purged, see <https://help.sap.com/viewer/p/CARAB> **|** [<Version>](#) **|** [Application Help](#) **|** [SAP Customer Activity Repository](#) **|** [Demand Data Foundation](#) **|** [General Services](#) **|** [Monitor Exceptions](#) **|** [>](#).

You don't need to specify parameters for the purging. What data is purged depends on the following settings:

- how you have configured the exceptions in Customizing (transaction `SPRO`) under **|** [Cross-Application Components](#) **|** [Demand Data Foundation](#) **|** [Basic Settings](#) **|** [Exception Management](#) **|** [>](#)
- what deletions you perform in the *Monitor Exceptions* service (transaction `NWBC`)

Delete Obsolete Diagnostic Data from UDF Tables

For example, `/DMF/UMD_PRI` is used as an input table for both modeling and forecasting. The table contains the priors generated for the demand model parameters. If you do lots of diagnostic runs (modeling runs with specific diagnostic IDs), the table can become very large, which can affect UDF performance.

Check if the table contains diagnostic results that you no longer need. If so, we recommend that you delete the records of the respective diagnostic ID (**and only these!**).

Limit Length of Demand History and Forecast Horizon

Demand History for Modeling

In general, we recommend that you provide two years of demand history as input for modeling. This ensures the proper interpretation of seasonality, trend, and other yearly demand influencing factors (DIFs).

However, and depending on how much historical data you have available, you also have the option to limit the length of the history taken into modeling. For one, this allows you to improve run times by limiting the amount of input data. Additionally, you can ensure that modeling (or the understanding of history) runs only on data that is still relevant for your scenario.

You can define the number of history days in Customizing under ► [Cross-Application Components](#) ► [Demand Data Foundation](#) ► [Modeling and Forecasting](#) ► [Define Modeling Control Settings](#) ►. Adjust the setting for the configuration type code *Days in Modeling Period* (MOD_DAYS_IN_PERIOD).

Forecast Horizon for Forecasting

You can define the length of the forecast horizon in Customizing under ► [Cross-Application Components](#) ► [Demand Data Foundation](#) ► [Modeling and Forecasting](#) ► [Define Forecasting Control Settings](#) ►.

Check how long the forecast horizon needs to be for your scenario. Use parameter FC_HZN_DUR_DAYS to configure the desired number of days that the forecast should cover (table /DMF/UFC_TS). When you submit a forecast job, you can also configure longer/shorter forecast horizons only for specific product-location combinations. Keep in mind that the forecast horizon has a considerable impact on runtime performance and sizing.

Adjust Modeling and Forecasting Control Settings in Customizing

Depending on your scenario, you might want to fine-tune the configuration for modeling and forecasting with optional configuration parameters. For descriptions of the parameters and instructions how to configure them, see sections [Configure Parameters for Modeling \[page 193\]](#) and [Configure Parameters for Forecasting \[page 206\]](#) in this guide.

Evaluate the recommendations for your scenario. If desired, adjust the settings in Customizing (transaction **SPRO**) under ► [Cross-Application Components](#) ► [Demand Data Foundation](#) ► [Modeling and Forecasting](#) ► [Define Modeling Control Settings](#) ► and [Define Forecasting Control Settings](#). For more information, see the documentation of each activity.

⚠ Caution

The default settings for modeling and forecasting have been chosen very carefully. Do not change them until you have conducted an in-depth statistical analysis and have tested and validated each potential adjustment or addition. Otherwise, the modeling and forecasting functions might be compromised.

Use MRP Type (Material Requirements Planning Type) to Model and Forecast Only Relevant Product Locations

During data replication from the source master data system, you most likely replicated your entire assortment to SAP Customer Activity Repository. In many cases, however, you will only want to model and forecast demand for a subset of the product locations. Here the MRP type can be very helpful because it allows you to exclude product locations that are not relevant.

Best Practices

To model and forecast only the desired product locations, it's best to start from the top down:

1. First check that you run modeling and forecasting only on **hierarchies** that you actually need. Remove any unnecessary hierarchies from the corresponding jobs.
2. Now use the **MRP type** to exclude individual product locations within specific categories. Note that those categories must have been at least partially modeled.

i Note

For more information on how you can use MRP types for your modeling and forecasting, see the application help for SAP Customer Activity Repository at <https://help.sap.com/viewer/p/CARAB>. Search for section *Forecast Multiple Product Types*.

Configuration

In the source master data system, the MRP type is maintained in the DISMM field in the MARC table. There are two ways how you can integrate this information into your SAP Customer Activity Repository system (product location table /DMF/PRODLOC, field MRP_TYPE).

1. Choose between the replication option and the mapping option:
 - Option 1: Use the data replication framework (DRF, transaction DRFOUT) to replicate the MRP type from the source master data system into Demand Data Foundation (DDF) in SAP Customer Activity Repository.
Choose this option if you only want to filter the product locations by their MRP type.
 - Option 2: Use the following Business Add-Ins (BAdIs) to map the field in the source master data system to the extension structure of the interface in DDF:
 - In the source master data system, implement the BAdI DMF_BADI_PRDLOC_EXTENSION_CUS, with the method MAP_EXTENSION.
 - In your SAP Customer Activity Repository system, implement the BAdI /DMF/PRODLOC_EXTENSION_CUST, with the method MAP_EXTENSION_STAGING.
 - Activate both BAdIs.
Choose this option if you want to filter the product locations not only by their MRP type but also by additional attributes, which you then specify via the BAdIs.
2. In Customizing (transaction SPRO), navigate to ► *Cross-Application Components* ► *Demand Data Foundation* ► *Modeling and Forecasting* ► *Assign Material Requirements Planning Types to Model Categories* ► and execute the activity.
3. In change mode, choose *New Entries*.
4. Add a new entry where you assign the MRP type(s) that you want to exclude to the model category EXCL.
5. Save your changes.

Result: When you next run modeling and forecasting, the product locations with MRP type(s) that you have excluded will be ignored.

Generate Only Necessary Tracing Information

Check different configuration parameters in Customizing to determine how much tracing information should be generated in modeling and in forecasting. Where possible, adjust the setting so that the system generates only data that is actually relevant for your scenario.

i Note

For information on how to adjust parameter settings, see [Configure Parameters for Modeling \[page 193\]](#) and [Configure Parameters for Forecasting \[page 206\]](#).

Modeling

In Customizing (transaction `SPRO`), navigate to [Cross-Application Components](#) [Demand Data Foundation](#) [Modeling and Forecasting](#) [Define Modeling Control Settings](#).

Check the following settings:

- **Generate only the reduced covariance matrix:**
The reduced covariance matrix reduces performance runtime and sizing. It is sufficient for most scenarios. The full covariance matrix uses more system resources and is only required for a few scenarios. See the *Complete UDF Setup* section in the *Common Installation Guide*. If the reduced covariance matrix is sufficient for your scenario, set the `MOD_COV_REDUCED` parameter to **X**.
- **Disable demand decomposition for modeling:**
The generation of the decomposition time series (table `/DMF/UMD_TSD`) during modeling has an impact on performance. We recommend that you only enable the demand decomposition for troubleshooting and analysis purposes, and then only for the affected product locations (using a configuration ID and a diagnostic ID). For regular production environments, set the `MOD_OUTPUT_DECOMP` parameter to `' ' = OFF`.
- **Disable output of model fit and tracing information:**
The `MOD_OUTPUT_TS` parameter controls the calculation and output of the model fit and tracing information (table `/DMF/UMD_TS`). For regular production environments, set the parameter to `' ' = OFF`.

Forecasting

In Customizing (transaction `SPRO`), navigate to [Cross-Application Components](#) [Demand Data Foundation](#) [Modeling and Forecasting](#) [Define Forecasting Control Settings](#).

Check the following settings:

- **Disable demand decomposition for forecasting:**
The generation of the decomposition time series (table `/DMF/UFC_TSD`) during forecasting has an impact on performance. We recommend that you only enable the demand decomposition for troubleshooting and analysis purposes, and then only for the affected product locations (using a configuration ID and a diagnostic ID). For regular production environments, set the `FC_OUTPUT_DECOMP` parameter to `' ' = OFF`.
- **Disable output of additional tracing information:**
The `FC_OUTPUT_TRACE` parameter controls the calculation and output of the model fit and tracing information (for example, product prices, product listings, closed days of locations). The output is written

to the `/DMF/UFC_TRC` table. Some of this information is used by the *Analyze Forecast* app (for example, to display future prices).

For regular production environments, set the parameter to ' ' = OFF.

- **Adjust output of FCI decomposition data:**

The `FC_OUTPUT_FCI` parameter controls the generation of the decomposition time series for the forecast confidence index (table `/DMF/UFCI_DECOMP`). Check that you have configured the appropriate level of FCI data to be output. For scenarios using the FCI, we recommend setting the parameter to 'P' (partially ON). This means you get the following output data: FCI values between 0 and 1, FCI reasons, FCI decomposition time series; however, no `FCI*_PCT` fields are calculated or output.

Reduce Number of Generated Exceptions (UDF Business Messages)

Depending on your assortment, the exceptions generated by modeling and forecasting jobs can apply to a great number of product location combinations. This in turn can have a negative impact on runtime and memory performance.

Review the exception configuration in Customizing. Where possible, adjust the configuration so that only those exceptions are raised that are actually helpful for your scenario. Disable any messages that you don't need:

1. In transaction `SPRO`, choose **► Cross-Application Components ► Demand Data Foundation ► Basic Settings ► Exception Management ► Maintain Configuration Data For High Level Exceptions ►**.
2. Execute the Customizing activity, choose *Assignment Business Area*, and filter the exceptions by the application area `/DMF/UDF_BUSINESS`.
3. In the *Default Priority* column, set each message that you don't need to *Not Relevant/Switched Off*.

i Note

The *Rel Except* column is not relevant, you don't need to change anything there.

4. Save your changes.

Enable Parallel Execution of Inbound Processing and Modeling/Forecasting

In the standard implementation, inbound processing and modeling/forecasting cannot run in parallel by design. Depending on your customer-specific processes and data, you might want to override this process lock and enable the parallel execution.

A modification to the standard implementation is available in SAP Note [2710523](#). Carefully read the note and make sure you are aware of the data and performance impacts for your scenario. If you decide to use the modification, implement the note.

Delete Obsolete Order Channels to Improve Performance of What-If Forecasts in SAP Promotion Management

In the default implementation, a what-if forecast is generated for each order channel defined in Customizing. If you delete the order channels that you don't use in your scenario, you can enhance the performance of the other what-if forecasts.

i Note

What-if forecasts are used in SAP Promotion Management scenarios. UDF generates these forecasts on demand when requested by the consuming application. The results are stored only in a specific granularity within the consuming application's database layer (for example, in table `/DMF/OFR_FIN_DTL`).

To delete obsolete order channels, adjust the configuration in Customizing (transaction `SPRO`) under [▶ SAP Customer Activity Repository](#) [▶ Retail Multichannel Foundation](#) [▶ Define Order Channels](#) [▶](#).

Optimize Performance for Offer Financials Data in SAP Promotion Management

If you are using UDF to generate what-if forecasts for SAP Promotion Management, you can optimize the processing of offer financials data.

In transaction `SPRO`, navigate to the following Customizing activities, read the accompanying documentation, and adjust the settings as required:

- To adjust the granularity of the offer financials data, see [▶ Cross-Application Components](#) [▶ Demand Data Foundation](#) [▶ Data Maintenance](#) [▶ Offer](#) [▶ Maintain Indicators for Offer Calculations](#) [▶](#).
- To reduce the number of calls between SAP Promotion Management and UDF, see [▶ Cross-Application Components](#) [▶ Demand Data Foundation](#) [▶ Data Maintenance](#) [▶ Offer](#) [▶ Specify Parameters for Offer Financials](#) [▶](#).
Choose *New Entries* and set the *Max Fin Records* field to a very large number (such as **1000000**).

Get Performance Tips for Different Scenarios in SAP Customer Activity Repository applications bundle

See SAP Note [2830512](#) [▶](#) *Performance Considerations for SAP Customer Activity Repository applications bundle 4.0 FPS02 and higher*.

4.3.5 Partition Tables for UDF and DDF

If your forecasting scenario involves large numbers of products and locations, the relevant Unified Demand Forecast (UDF) and Demand Data Foundation (DDF) tables can become very large. To improve standard

database operations (such as inserting, updating, deleting, and reading) and mass operations (such as archiving or index merging), we recommend to partition those tables.

Prerequisites

You have set up UDF and DDF as described in the *Common Installation Guide* (for new installations) or the *Common Upgrade Guide* (for upgrade scenarios). Both guides are available on SAP Help Portal at <https://help.sap.com/viewer/p/CARAB>. Select your version at the top right.

Procedure

1. Make yourself familiar with the following general rules:
 - Tables with more than 2 billion records must always be partitioned.
 - Create only as many partitions as you really need, because too many partitions can have a negative impact on performance.
 - To help you with the partitioning decisions, consult the sizing information for your solution. For example, check the number of records estimated for the large tables to decide which tables to partition and how many partitions you need.
You can find a sizing guideline and a sizing questionnaire for SAP Customer Activity Repository applications bundle at <https://help.sap.com/viewer/p/CARAB> under *Additional Information*.
2. Depending on your system type (single-host or multiple-host), choose one of the following SAP Notes and follow the sizing instructions:
 - For single-host systems (scale-up approach), see SAP Note [2190377](#).
 - For multiple-host systems (scale-out approach, distributed systems), see SAP Note [2700982](#).

More Information

For sizing information for ABAP on SAP HANA (SAP S/4HANA, SAP Retail), see SAP Note [1872170](#).

For general sizing information for SAP solutions, see <https://www.sap.com/about/benchmark/sizing.html>.

4.3.6 Configure Hierarchical Priors (HPRs)

Configure the calculation of hierarchical priors to enhance the modeling of products for which little or no historical sales data or promotional data is available. With hierarchical priors, such products can “inherit” existing modeling results from suitable existing products along the hierarchies (product hierarchies, location hierarchies, relationships between generic products and their variants).

Prerequisites

Before you can calculate HPRs, you must have completed the initial modeling of your business. This allows the system to use the modeling results of the existing products to calculate the HPRs for the new products. The calculated HPRs are then used as input to model the new products, enhancing the understanding of demand at a more granular level than the default values (global priors). This in turn improves the basis for forecasting.



→ Tip

How often you should run each step

You only need to do the initial modeling once.

In day-to-day operations, you would typically repeat the HPR calculation and the subsequent modeling at regular intervals, as suitable for your scenario.

Using the modeling results (which are always persisted), you can then run forecasting. Forecasting is the final and most frequent step. You can run it as often as required for your scenario. The following execution modes are available:

- Production forecast: You want to use the results in the productive system and in follow-on business processes.
- Diagnostic forecast: You want to perform analyses, such as holdout forecasts.
- What-if forecast: You want to gauge the impact of a potential future course of action (for example, when planning offers).

Restrictions

- There is no interaction between product locations with different multichannel information (that is, sales channel, order channel, distribution chain). Each combination of multichannel information is treated separately.

i Note

Sizing Consideration — Multichannel Keys for New Product Locations

Each multichannel combination is calculated separately.

To calculate the HPRs for new products locations, the system tries to determine the multichannel keys from the neighboring products in the hierarchy. This means that if a product location under the same node already has model parameter estimates in a specific product-location-multichannel combination, this multichannel key is used for the new product location under this node.

- As a result, it is not possible to calculate HPRs for product locations with a completely new channel (for example, when opening a new Web shop).

- Similarly, it is not possible to calculate HPRs for a completely new product in a completely new location (for example, when opening a new fashion store selling a new fashion collection).

Customizing

- You can configure the calculation of hierarchical priors in transaction **SPRO** under [Cross-Application Components > Demand Data Foundation > Modeling and Forecasting > Configure Hierarchical Priors](#). For more information, see the Customizing activity documentation.
- The generation of the reduced covariance matrix is sufficient for hierarchical priors. For more information, see the `MOD_COV_REDUCED` parameter in [Configure Parameters for Modeling \[page 193\]](#).
- For sizing reasons, we strongly recommend to change the setting for the generation of the covariance matrix from “full” to “reduced”. The reduced covariance matrix is sufficient for HPRs and saves runtime. You can change the setting in [Cross-Application Components > Demand Data Foundation > Modeling and Forecasting > Define Modeling Control Settings](#). Execute the activity. Choose *New Entries* and enter `MOD_COV_REDUCED` as the *Configuration Type Code* and **x** as the *Configuration Value*. Save your changes.

Configuration Help

To determine from which existing products a new product should best “inherit” the values, the system considers different types of hierarchical information. You can configure how each type should be weighted against the other types. This allows you to adapt the generation of hierarchical priors to your own hierarchies. The following types are considered:

1. Relationships between generic products and their variants: A product in a specific location inherits values from **other** products (in the same location) with a relationship to the **same** generic product. This allows you to better understand DIF effects across the variants of a generic product in a particular location.
2. Product hierarchy (such as the article hierarchy or merchandise category hierarchy): A product in a specific location inherits values from **other** products in the **same** location. This allows you to better understand DIF effects across all products of a hierarchy node for a particular location.
3. Location hierarchy: A product in a specific location inherits values from the **same** product in **other** locations. This allows you to better understand DIF effects across all locations of a hierarchy node for a particular product.

Based on the configured weights, the results of the first two steps are combined into one intermediate result. This is then combined with the result of the third step to generate the final result.

For configuration examples, see the long texts of the following data elements:

- `/DMF/HPR_MAX_PROD_LEVELS`
- `/DMF/HPR_MAX_LOC_LEVELS`
- `/DMF/HPR_WGT_GEN_VAR`

Expert Configurations

There might be situations when you need to override or fine-tune the default settings that you have made in Customizing. The default settings are saved in the `/DMF/UMD_CONFIG` table (maintenance view `/DMF/V_UMD_CONFIG`). You can override them by changing selected model parameters in the `/DMF/UMD_PAR_CFG` model configuration table.

⚠ Caution

These are advanced configurations that should only be done by experts (such as consultants, forecast analysts, or demand planners).

The default settings for modeling and forecasting have been chosen very carefully. Do not change them until you have conducted an in-depth statistical analysis and have tested and validated each potential adjustment or addition. Otherwise, the modeling and forecasting functions might be compromised.

Follow these steps:

1. Execute transaction **SM34** and open the `/DMF/V_DMD_DEF_D` (*Demand Model Definition Details*) view cluster.
You can use this view cluster to change model parameters in the `/DMF/UMD_PAR_CFG` table.
2. If you are prompted for a *Work Area*, select the demand model definition for which you want to change the parameter.
3. Select an existing parameter and display the details.

i Note

You can also add new entries. For instructions, see [Configure User DIFs \[page 232\]](#).

4. Change the parameter settings as desired.

Examples

- In *Influence HPRs*, you can define the influence of the hierarchical priors against the global priors. For example, if you have a well-defined product hierarchy that provides a good basis for the HPR calculation, you might want to explicitly use the calculated HPRs (and not the global priors) in subsequent modeling. You can then use the new parameter to increase the influence of the calculated HPRs.
 - In *Additional Weight*, you can add user-defined weights to the calculated hierarchical prior weights for selected demand influencing factors (DIFs).
For example, if you have products whose sales are heavily influenced by the Christmas season, you can use the new parameter to increase the weight of this calendar event.
5. Save your changes.

Execution

To calculate the hierarchical priors based on your configuration, follow these steps:

1. Execute transaction **NWBC** and choose **Services** > *Schedule Model and Forecast*.
2. Select the *Calculate Hierarchical Priors* service.

3. Make the other settings for this job and either execute it directly or schedule it for a later point in time.

This is the recommended procedure. Alternatively, you can directly execute the `/DMF/UCALC_HIER_PRIORS` function module (transaction **SE37**).

Results

The system calculates the hierarchical priors for all product locations below the specified node in the specified product and location hierarchies and the relationship between the generic product and the variants.

The results are written to the `/DMF/UMD_PRI` table and used as input for modeling.

4.3.7 Configure Time-Dependent Error Variances (Recommended)

Enable the calculation of time-dependent error variances for **modeling** and for **forecasting**. We highly recommend that you do this for any scenario. In replenishment scenarios, for example, time-dependent error variances allow you to get more accurate service levels and safety amounts. Note, however, that the calculation might have an impact on performance, especially in modeling.

Procedure

By default, only mean error variances are calculated. To enable the calculation of time-dependent error variances, do the following in Customizing (transaction **SPRO**):

1. Navigate to **Cross-Application Components** > **Demand Data Foundation** > **Modeling and Forecasting**.
2. For modeling, execute the Customizing activity **Define Modeling Control Settings**.
3. Choose **New Entries**. For each time series source that you wish to use, add an entry with the following settings:

Field	Setting
<i>Diag ID</i>	(Optional) Specify a diagnostic ID if you wish to run the job in diagnostic mode. For production mode, leave the field blank.
<i>Time Series Source</i>	Select the time series source.
<i>Config ID</i>	(Optional) Specify a configuration ID if you wish to use a granular configuration for this modeling job. For details, see the <i>More Information</i> section below.
<i>Configuration Type Code</i>	Specify MOD_TD_ERROR_VARIANCE .

Field	Setting
<i>Configuration Value</i>	Specify X .

- Save your changes.
- For forecasting, execute the Customizing activity *Define Forecasting Control Settings*.
- Choose *New Entries*. For each time series source that you wish to use, add an entry with the following settings:

Field	Setting
<i>Diag ID</i>	(Optional) Specify a diagnostic ID if you wish to run the job in diagnostic mode. For production mode, leave the field blank.
<i>Time Series Source</i>	Select the time series source.
<i>Config ID</i>	(Optional) Specify a configuration ID if you wish to use a granular configuration for this modeling job. For details, see the <i>More Information</i> section below.
<i>Configuration Type Code</i>	Specify FC_TD_ERROR_VARIANCE .
<i>Configuration Value</i>	Specify X .

- Save your changes.
- (Optional, only relevant for integration scenarios between UDF and SAP Forecasting and Replenishment) If you wish to retrieve time-dependent error variances via the RFC-enabled function module `/DMF/UFM_RETRIEVE_RESULTS_FR`, you must do some additional steps to explicitly enable their usage in SAP Forecasting and Replenishment. Follow the instructions in the following SAP Notes:
 - [2613998](#) - UDF Forecast in F&R: Consideration of Daily Variances (Functionality)
 - [2614098](#) - UDF Forecast in F&R: Consideration of Daily Variances (Customizing Screen)
 - [2616091](#) - UDF Forecast in F&R: Consideration of Daily Variances (Consulting)
For more information about this integration scenario, see the *Provide Demand Forecasts to External System* section in the *SAP Customer Activity Repository Application Help*.

Results

When you now run modeling and forecasting, a separate error variance is calculated for each demand influencing factor (DIFs, such as holidays, promotions, or high season regimes). You get a specific error variance value for each day.

Output of Time-Dependent Error Variances in Modeling and Forecasting

Output Table	Field	Output Data
/DMF/UMD_TS	MOD_VAR	Contains the modeled error variances based on historical data.
/DMF/UMD_PAR	PAR_VAR	Contains the estimated error variance parameter values.
/DMF/UFC_TS	FC_VAR	Contains the forecasted error variances.

More Information

For information about granular configuration options for modeling and forecasting, see the following:

- Feature description: <https://help.sap.com/viewer/p/CARAB> ► *Version: 2.0 SPS2 (or higher)* ► *Application Help* ► *SAP Customer Activity Repository* ► *What's New in SAP Customer Activity Repository* ► *What's New in SAP Customer Activity Repository 3.0 FP1* ► *Granular Configuration* ►
- Customizing: See the *Maintain Model Profiles* and *Maintain Forecast Profiles* activities under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Modeling and Forecasting* ►

4.3.8 Configure User DIFs

User DIFs are generic demand influencing factors that you can define as additional input for modeling and forecasting. User DIFs can be Boolean, metric, or Ignore DIFs. They complement the system DIFs because they allow you to feed external past and future events and factors into the system that have an impact on consumer demand.

Note

Ignore DIFs are a specific type of user DIFs. The information in this section is also valid for Ignore DIFs.

Prerequisites

You are familiar with the different use cases for user DIFs and have carefully read the descriptions under <https://help.sap.com/viewer/p/CARAB> ► *<Version>* ► *Application Help* ► *SAP Customer Activity Repository* ► *Unified Demand Forecast* ► *Features* ► *Demand Influencing Factors (DIFs)* ► *User DIFs* ►.

Caution

If you wish to configure user DIFs for *Use Case 3: Enhance the standard demand model with additional DIFs*, you must first conduct an in-depth statistical analysis of the data to determine how the effect on the

demand can be expressed mathematically as a demand influencing factor (DIF). We strongly recommend that you contact SAP for support.

Configuration Overview

The procedure below describes the two main configuration phases:

- **Initial configuration:** Data analysts typically do an in-depth analysis of the customer-specific demand landscape. Based on the results, they determine the external factors that are expected to have a significant influence on the demand. To be able to consider these factors in modeling and forecasting, they need to create these technical user DIFs in the back-end system and set up the DIF library accordingly. The DIF types can vary (Boolean DIFs, Ignore DIFs, metric DIFs). This initial configuration only needs to be done once (the library can be extended over time if necessary).

Tools used:

- Transactions in ABAP back-end system (mandatory for all DIF types)
- DIF library setup in the *Manage Demand Influencing Factors* app (fine-tuning for Boolean DIFs, Ignore DIFs)

- **Daily demand planning:** When the library is available, demand planners can use and **reuse** the contained DIFs in their daily work.

Tools used:

- Import of the configured user DIFs via the `/DMF/MDIF_USRDIF` staging table in the ABAP back-end system (metric DIFs)
- Creation of DIF assignments and configuration of DIF occurrences in the *Manage Demand Influencing Factors* app (Boolean DIFs, Ignore DIFs)

Both options are described in the procedure below.

i Note

You can display the names and descriptions of technical user DIFs in the *Analyze Forecast* app. This is true for all DIF types and regardless of the tools used.

Procedure

Initial Configuration: Create Technical User DIF in Back-End System (All DIF Types)

1. Log on to your back-end system.
2. Create the new technical user DIF:
 1. Execute transaction **SM30** and open the `/DMF/V_DIF` maintenance view in change mode.
 2. Choose *New Entries* and enter the data for your new user DIF. For example, select the DIF type (such as *Boolean* or *Metric*).

→ Tip

Use a naming convention that allows you to easily identify user DIFs in your system. For example, use a prefix such as **USR: . . .** for each user DIF ID.

Do not use the prefix **sys: . . .**, as this is reserved for system DIFs.

3. Save your changes.
4. (Optional, recommended) Provide user DIF descriptions in the `/DMF/V_DIF` table view.

i Note

If you provide the descriptions, you can display them in the *Analyze Forecast* app as helpful context information for the user DIFs.

1. Execute transaction `SE16` and open the `/DMF/V_DIF` table view.
 2. Identify your user DIFs in the list.
 3. In change mode, add meaningful user DIF descriptions in the *DIF Tag Description* column.
 4. Save your changes.
3. Add the new user DIF to the demand model definition and define the user DIF details:
 1. Execute transaction `SM34` and open the `/DMF/VC_MOD_DEF` view cluster in change mode.
 2. Select the desired demand model definition and double-click *Demand Model Definition Details*.
 3. Choose *New Entries* and define the demand model definition details for the user DIF:
 - In *DIF ID*, select your new user DIF.
 - Leave *DIF Attributes* empty (not relevant for user DIFs).
 - In *Model Component*, select `PMGA:M`.

⚠ Caution

We strongly recommend to use this multiplicative model component.

The additive model component `PMGA:A` should only be used after a careful analysis of the data and specific scenario. Contact SAP for support in this case.

- In *DIF Usage Mode*, select *On* for a regular user DIF.
For an **Ignore DIF**, select *Exclude Observations*.
- With Boolean user DIFs: In *Default Prior Value*, specify the initially expected effect of the prior value.
You can use the following formula to determine this value:
 $(1 + p)$, where **p** is the expected percentage change as a decimal
Example: You know that roadworks are planned in front of your store and expect a 30% reduction in sales during this period. This means, **p = -0.30**. To determine the default prior value, you would then calculate **$\ln(1 - 0.30)$** .

i Note

Once the effect of the user DIF can be determined based on the history of the respective product location combination or the DIF values coming from the prior fallback logic, the initial prior value is replaced because the system assumes that more accurate data is available.

For information about the fallback logic used in UDF, see <https://help.sap.com/viewer/p/CARAB> > <Version> > *Application Help* > *SAP Customer Activity Repository* > *Unified Demand Forecast* > *Process Flow* > *Fallback Values for Modeling and Forecasting* >.

- In *Default Prior Weight*, leave the default value of **1**. The prior weight is used to modulate the initially expected DIF effect against the actual future sales when the event occurs.

⚠ Caution

We strongly recommend to keep this setting. Values other than the default must first be tested and validated very carefully.

- If applicable to your scenario, specify a suitable *Parameter Minimum* (for negative DIF effects) or *Parameter Maximum* (for negative DIF effects). For example, you would expect a reduction in price to always lead to an increase in sales (that is, to have a negative DIF effect).
4. Save your changes.

You have successfully created the technical user DIF in your back-end system.

i Note

Each technical user DIF can be reused as many times as required, to configure the actual events when the DIF will occur.

Manage Demand Influencing Factors App: Create DIF Assignments for Technical User DIF (Boolean User DIFs, Ignore DIFs)

i Best Practices

- If you wish to create DIF assignments for a **recurring event** (for example, the back-to-school period), first check if there is already a technical user DIF for this event. If so, only add the additional occurrences to it. We recommend this approach because it saves you from having to define a new prior value manually. Instead, you let the system derive the prior value automatically when calculating the hierarchical priors.
- Do not create a new technical user DIF for each event. The system would interpret each of them as a completely new event that has never been observed before.
- We recommend that you group similar events by assigning them to the same technical user DIF. This improves the statistical basis for calculating the DIF effects.

1. Open the *Manage Demand Influencing Factors* app.
2. Create a DIF assignment:
Select a *DIF name* from the DIF library. The DIF library contains DIF names where the technical user DIFs, as previously created in the back-end system, are assigned. The same technical user DIF can be assigned to multiple DIF names.
3. Enter a DIF assignment description and select the status for the DIF (either active or inactive).

i Note

Only active DIF assignments are considered in modeling and forecasting.

4. Configure the individual events (occurrences):
Add one or more validity periods and select the products and locations affected each time.

Back-End System: Import User DIFs Into Staging Table (Metric User DIFs)

1. Insert the data for each occurrence of each metric user DIF into the `/DMF/MDIF_USRDIF` staging table.
2. Transfer the data from the staging table to the production table. This is a general step that you perform during regular inbound processing.
For more information, see the application help for SAP Customer Activity Repository at <https://help.sap.com/viewer/p/CARAB> and search for section *Inbound Processing*.

Result

When you now run modeling and forecasting in production mode, the system will create the data and estimate the effect of each occurrence of the technical user DIF on the demand.

4.3.9 Configure User DIFs for Promotion Cannibalization for SAP Advanced Trade Management Analytics

How you can measure promotion cannibalization in UDF for SAP Advanced Trade Management Analytics scenarios.

Configuration Help

There are several steps in the process. Some steps are oriented towards the business process, and the others are technical. Before performing this procedure, you should have an idea of which promotions cause a cannibalization effect and which products are cannibalized.

Experience shows that the scenario which generates the most measurable cannibalization is when a group of related products are all promoted at once, and there are exact or near substitutes for this product that are not promoted. Repeating the promotion also increases the strength of the cannibalization effect.

Overview

In the procedure below, you will do these three steps to configure a user DIF for promotion cannibalization:

1. Configure the user DIF.
2. Configure modeling to consider the user DIF.
3. Configure the mapping of the user DIF to the delta unit sales (DUS).
4. Create and load the user DIF data.

Procedure

Configure the User DIF

1. Execute transaction `SM30`, open maintenance view `/DMF/V_DIF` in change mode, and choose [New Entries](#).
2. Make the following settings:
 - **DIF ID**: Specify the technical name of the DIF. It must have a prefix of **USR**, followed by a colon and any meaningful text of up to 32 characters (for example, **USR : CANN**).
 - **DIF Name**: Specify a meaningful name.

- *DIF ID Description*: Specify a meaningful description.
 - *DIF Attribute Description*: Specify a meaningful description. For example, describe how a DIF attribute will differentiate one offer/promotion driving cannibalization versus another.
 - *DIF Type*: Select **Metric**.
 - *DIF Assignment Level*: This setting determines which imported cannibalization records are associated with which product-location-multichannel keys for modeling and forecasting jobs.
If your use case is for syndicated data, which has no multichannel keys, select **Prod Loc**.
3. Save your changes.

Configure Modeling to Consider the User DIF and Map the User DIF to Delta Unit Sales (DUS)

1. Execute transaction SM34 and open maintenance view /DMF/VC_MOD_DEF in change mode.
2. Choose the demand model definition that you want to edit. You may also choose *New Entry* to add a definition.

i Note

To add/edit details, first select the model definition in the dialog. In the *Dialog Structure* then double-click *Demand Model Definition Details*.

3. Make the following settings:
 - *Model Definition ID*: Using a new model for this example. You can choose to do this if only a small subset of product locations will use the cannibalization user DIF. If you leave the DIF in for all product locations, the performance may be slightly slower and the demand decomposition (if activated) will add one row per product-location-time-period.
 - *Default Prior Value*: Set this to zero. There should not be a cannibalization effect by default.
 - *Parameter Minimum*: Leave as is. Experience has shown that even -5.0 would be an extreme value. Setting this value accordingly would be a safeguard.
 - *Parameter Maximum*: There is no logical reason why a cannibalized product would show increased sales. Set this value to 0 so that increased sales (during modeling) are attributed to a different factor. If no cannibalization was detected in modeling, the user DIF will be ignored in forecasting.
 - *DUS Mapping*: For the current implementation, consider this user DIF as an *Other* factor.
4. Save your changes.

Create and Load the User DIF Data


i Note

Loading is an ongoing process that may happen any time after configuration.

The *Manage Demand Influencing Factors* app does not support syndicated data, therefore all user DIFs must be imported via the /DMF/MDIF_USER_DIF_INBOUND function module.

The /DMF/MDIF_USER_DIF_INBOUND function module allows you to load data to a staging table. For instructions, see the accompanying system documentation in transaction SE37.

When you have loaded the data into the staging table, you use an option in the *NetWeaver Business Client* to load the /DMF/USER_DIF table:

1. In transaction NWBC, navigate to **Services** > *Monitor Imports* .
2. Select *Manual Processing*.

3. In the popup window, select the *USER DIF* check box and choose *Execute*.

The following fields are required in your data file:

USER DIF Entries

Column	Description	Data Requirements
EXP_PRODUCT_ID	Product identifier	Max. 60 characters
EXT_LOCATION_ID	Location identifier	Max. 60 characters
LOCATION_TCD	Location type code	1040 for regular stores
SALES_ORG	Sales organization	If you have selected the assignment level Prod Loc , leave blank.
DISTR_CHANNEL	Distribution channel	
ORDER_CHNL_ID	Order channel	
DIF_TAG	DIF identifier	For example, USR : CANN .
DIF_ATTR	DIF attribute	Any text up to 32 characters. External offer IDs are 36 characters, so you cannot use them in this column and guarantee unique DIF attributes.
TSTMP_FR	Start of effective period	Period when to apply the entry to modeling and forecasting. While it is possible to have two rows for the same product-location-time-period, this is not good practice for modeling. It is reasonable to have two overlapping date ranges. If they are exactly the same, modeling will essentially divide the combined effect of the two DIFs randomly between them.
TSTMP_TO	End of effective period	
DIF_VALUE	Value to use in modeling / forecasting	The proportion of the sales to which the DIF applies. The value of the DIF should be between 0.0 and 1.0 inclusive. A value of 0.0 means none of the sales were affected by a cannibalizing offer. 1.0 means all sales were affected. Values between these extremes are useful when the data is aggregated. For example, if the data is at the weekly level, perhaps the cannibalizing promotion was in effect on 3/7 of the days one week.

4.3.10 Configure Ignore DIFs

Ignore DIFs are Boolean user DIFs that you configure with *DIF Usage Mode* set to *Exclude Observations*. In all other respects, you configure Ignore DIFs like user DIFs.

Procedure

1. Follow the same steps as for user DIFs. See [Configure User DIFs \[page 232\]](#).

4.3.11 Configure Reference Products

Use reference products to enhance the modeling of products for which little or no historical data is available (such as new products without past sales or promotions).

Prerequisites

- The reference product has been modeled, so that the new product or the placeholder product can inherit the modeling results.
- The reference product is assigned to the desired new product or placeholder product (table `/DMF/PROD`, fields `CONS_REF_PROD_ID` and `CONS_REF_LOC_ID`).
- The two field values point to a valid product location (table `/DMF/PRODLOC`, fields `PROD_ID` and `LOC_ID`). The relationship is always: product location B ↔ product location A.
- Optional: A consumption reference factor has been specified (field `CONS_REF_FACTOR`). This factor is generally provided by the source master data system and it can be changed in DDF.
Example: You want to use smart phone model X1 as the reference product for the new smart phone model X2. For X2, you expect a 10% increase in sales. You can then use the reference factor to indicate this expected change in the sales behavior.

Procedure

You have the following options:

- You can set up reference products in your SAP ERP system and receive the master data from there.
- Alternatively, you can set up reference products directly in Demand Data Foundation (DDF). For more information, see <https://help.sap.com/viewer/p/CARAB> > <Version> > *Application Help* > *SAP Customer Activity Repository* > *Demand Data Foundation* > *General Services* > *Maintenance Services* > *Maintain Product Locations* >.

Result

When modeling the demand for the new product, the system uses the historical data and prior values from the assigned reference product at the reference location.

4.3.12 Configure Placeholder Products

Create placeholders for products that are still being planned and for which you do not yet have all the information to create them in your source master data system (such as SAP ERP). For example, placeholder products are useful during promotion planning or assortment planning.

Context

- You create the placeholder product as a temporary product in Demand Data Foundation (DDF) and assign a reference product to it. From here, you can later transfer it to the source master data system, where it can be converted into an actual product. Once the actual product is imported into DDF, the placeholder product is replaced with the actual product.
- You can use placeholder products in modeling and forecasting with Unified Demand Forecast (UDF):
 - Placeholder products are treated the same way as products that you import from or integrate with your master data system.
 - If the assigned reference product has been previously modeled, the forecast is scaled by the reference factor. You can define this factor in the placeholder product master data.
 - If the reference product has not been previously modeled or is invalid, the forecast is generated based on the prior values.

Prerequisites

i Note

You can identify placeholder products by their status (table `/DMF/PROD`, field `PROD_STATUS_CD`, status `03 (PHP)`).

- The placeholder product must have a reference product assigned to it (table `/DMF/PHP`, field `REF_PRODUCT_ID`).
The relationship is always: product B ← product A.
- The placeholder product must be active (table `/DMF/PHP`, field `PHP_STATUS_CD`). The field value must not be `05 (Deleted)`.

Procedure

1. You configure placeholder products in Customizing (transaction **SPRO**). See the Customizing activities and their documentation under [► Cross-Application Components ► Demand Data Foundation ► Data Maintenance ► Placeholder Products ►](#).

More Information

See the following sections under <https://help.sap.com/viewer/p/CARAB> [► <Version> ► Application Help ► SAP Customer Activity Repository ► Demand Data Foundation ►](#):

- For information on the placeholder product master data, see [► Data Management ► Master Data ► Placeholder Product ►](#).
- For information on the placeholder product maintenance service in transaction **NWBC**, see [► General Services ► Maintenance Services ► Maintain Placeholder Products ►](#).

4.3.13 Configure Forecasting Based on Aggregated Product Data (Aggregation Profile 0001)

Aggregation profile 0001 is designed for out-of-the box integration with the in-season fill-in scenario in SAP Allocation Management. The configuration and scheduling are performed in SAP Allocation Management. No additional configuration is required in Unified Demand Forecast (UDF). This section describes the aggregation profile in more detail.

Prerequisites

- Your historical demand data is daily level point-of-sale data (time series source **POS_TS**, time granularity **D (Day)**).
- You are aware of the implementation considerations, consistency requirements, and restrictions for this aggregation profile. For more information, see the *Improve Forecasts Through Modeling Aggregate Data (Aggregation Profile 0001)* section under <https://help.sap.com/viewer/p/CARAB> [► <Version> ► Application Help ► SAP Customer Activity Repository ► Unified Demand Forecast ► General Services ► Model and Forecast Demand Based on Aggregated Data ►](#).

Aggregation Overview

Context

Running modeling and forecasting based on aggregated historical sales data is especially beneficial for seasonal products with short lifecycles (such as fashion). In cases where the data at the level of the individual product location (variant) and day is sparse, the aggregated data (generic product by color) can help achieve a better signal strength for statistical modeling and forecasting.

What Data is Aggregated

With aggregation profile 0001, the system aggregates the historical sales information of the product variants (sizes) based on the specified generic product and the specified location. The color information is derived automatically. The aggregated data is used to generate the demand model at the level of the generic product. Based on this aggregated model, the system then generates the forecast.

Implementation in UDF

The most important implementation objects for aggregation profile 0001 on the UDF side are as follows:

Object	Purpose
/DMF/V_AGPROF_ID	Maintenance view with preconfigured settings for aggregation profile 0001, for use in SAP Allocation Management. To view the settings, execute transaction SM30 and double-click the row for 0001 .
/DMF/OP_MOD_PDIMLDIM_JOB	Report used to run demand modeling based on the settings in aggregation profile 0001. The execution of the report is configured and scheduled in SAP Allocation Management.
/DMF/UMD_PAR	Output tables containing the results of demand modeling.
/DMF/UMD_TS	For output, you get a demand model with model parameters for the generic product, based on the aggregated historical sales data of the product variants.
/DMF/UMD_TSD (if demand decomposition is enabled in Customizing)	
/DMF/OP_FCST_PDIMLDIM_JOB	Report used to run demand forecasting based on the demand modeling results for aggregation profile 0001. The execution of the report is configured and scheduled in SAP Allocation Management.
/DMF/UFC_TS	Output tables containing the results of demand forecasting.
/DMF/UFC_TSD (if demand decomposition is enabled in Customizing)	For output, you get a daily forecast value for the generic product, across all variants sharing the same color, in this location, for the specified time period.

Implementation in SAP Allocation Management

For information, see the *Enabling Demand Data Foundation and Setting Up Demand Forecasting for Allocation Processing* section of the *SAP Allocation Management Administration Guide*.

4.3.14 Configure Modeling for Group of Product Locations (Aggregation Profile 0002)

Configure aggregation profile 0002 to run demand modeling on a specified group of product locations, using aggregated point-of-sale (POS) data for input. Then use the results of this aggregated modeling to enhance the modeling and forecasting at the product location level.

Prerequisites

- You have read the *Improve Product Location Forecasts Through Modeling Aggregate Data (Aggregation Profile 0002)* section under [https://help.sap.com/viewer/p/CARAB|><Version>|>Application Help |> SAP Customer Activity Repository |> Unified Demand Forecast |> General Services |> Model and Forecast Demand Based on Aggregated Data](https://help.sap.com/viewer/p/CARAB|><Version>|>Application+Help|>SAP+Customer+Activity+Repository|>Unified+Demand+Forecast|>General+Services|>Model+and+Forecast+Demand+Based+on+Aggregated+Data).
- Your input data meets the following requirements:
 - **Time series:** You can only use aggregation profile 0002 with daily level point-of-sale data. That is, the time series source must be POS_TS and the time granularity must be *D (Day)*.
 - **Data consistency:** All product locations of the specified group must have the **same unit of measure (UoM)**, the **same currency**, and the **same model definition**.

⚠ Caution

There is no consistency check. The system selects a product location and uses its settings for the other product locations as well.

i Note

The locations can have **different offers** and **different calendars** (holidays, closed days). If there are different calendars within a location group, they are weighted by percentage.

- All product hierarchies and products and all location hierarchies and locations must come from the same source master data system (*Logical System*).

i Note

Hierarchies with status *DELETED* are not considered for the aggregation.

Configure and Run Modeling with 0002

To configure and run aggregated modeling, you first review the default settings of aggregation profile 0002 and adjust them as needed. Then you execute a report to run modeling based on this aggregation profile.

1. In transaction **SM30**, specify /DMF/V_AGPROF_ID as the view and choose *Maintain*.
2. Double-click the table row with *0002* to display the default settings for this aggregation profile.

3. Review the settings and, where necessary, adjust them for your scenario. Use the following table for reference:

Fields of Aggregation Profile 0002	Configuration Help
<i>Aggregation Profile</i>	The aggregation profile ID must be 0002 . Do not change it.
<i>Agg Profile Desc</i>	(Optional) If helpful for your scenario, update the default description.
<i>Granularity Type</i>	The time series granularity must be <i>D (Day)</i> . Do not change it.
<i>Multi-Channel Agg</i>	Keep the default setting.
<i>Curr Consistent</i>	Keep the default setting.
<i>UOM Consistent</i>	Keep the default setting.
<i>Calendar Consistent</i>	Do not select this option, irrespective of whether your locations have consistent calendars or not.
	<div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p>i Note</p> <p>Make sure that the <code>SYS:ACV DIF</code> is enabled. This setting is required for best forecast accuracy.</p> </div>
<i>Offer Consistent</i>	Keep the default setting.
<i>Scale Factor</i>	<p>(Optional) Specify a factor to adjust the maximum task size in load balancing for the aggregation.</p> <ul style="list-style-type: none"> ○ You can set the maximum task size in transaction NWBC under Services > Configure Load Balancing > Num Records. This maximum task size will be divided by the scale factor that you specify here. ○ Example: <i>Num Records</i> = 1000; <i>Scale Factor</i> = 2; maximum task size for the aggregation = 500
<i>Logical System</i>	Select the source master data system where the hierarchies are maintained.

Fields of Aggregation Profile 0002

Configuration Help

Product Group Name

You have two options:

- Leave the field blank. Use this option if you want to specify a list of hierarchies (for example, product groups) in the /DMF/OP_MOD_PDIMLDIM_JOB report below.
- Specify the external ID of the product hierarchy that you wish to use for the aggregation. Use this option if you want to specify nodes of this hierarchy in the /DMF/OP_MOD_PDIMLDIM_JOB report below.

Location Hierarchy

You have two options:

- Leave the field blank. Use this option if you want to specify a list of hierarchies (for example, location clusters) in the /DMF/OP_MOD_PDIMLDIM_JOB report below.
- Specify the external ID of the location hierarchy that you wish to use for the aggregation. Use this option if you want to specify nodes of this hierarchy in the /DMF/OP_MOD_PDIMLDIM_JOB report below.

4. Save your changes.

Now you can use aggregation profile **0002** to run the modeling report for your scenario.

5. In transaction **SE38**, specify /DMF/OP_MOD_PDIMLDIM_JOB as the report (program) and choose *Execute*.
6. Configure the report for your scenario. Use the following table for reference:

Fields in Modeling Report /DMF/OP_MOD_PDIMLDIM_JOB

Configuration Help

Job ID

Specify a numerical ID so that you can later identify the modeling job in the log.

Master Data System

Specify the same system as above in field *Logical System* of aggregation profile **0002** in maintenance view /DMF/V_AGPROF_ID.

Diagnostic ID

(Optional) Specify a predefined diagnostic ID if you wish to run modeling in diagnostic mode.

Time Series Source

Specify **POS_TS**.

Granularity Type

Select **D (Day)**.

Model End Date

(Optional) If left blank, the field defaults to the current date.

Aggregation Profile ID

Specify **0002**.

Fields in Modeling Report /DMF/OP_MOD_PDIML-DIM_JOB

Configuration Help

<i>Configuration ID</i>	(Optional) Specify a configuration ID if you wish to use a more granular configuration for this modeling job. For details, see the <i>More Information</i> section below.
<i>Product Dimension ID</i>	You have two options: <ul style="list-style-type: none">○ If you have left field <i>Product Group Name</i> of aggregation profile <i>0002</i> blank: Specify one or more hierarchies (for example, product groups) for which you wish to aggregate the data.○ If you have specified a hierarchy in field <i>Product Group Name</i> of aggregation profile <i>0002</i>: Specify one or more nodes of this hierarchy.
<i>Location Dimension ID</i>	You have two options: <ul style="list-style-type: none">○ If you have left field <i>Location Hierarchy</i> of aggregation profile <i>0002</i> blank: Specify one or more hierarchies (for example, location clusters) for which you wish to aggregate the data.○ If you have specified a hierarchy in field <i>Location Hierarchy</i> of aggregation profile <i>0002</i>: Specify one or more nodes of this hierarchy.
<i>Location Dimension Type Code</i>	Keep the default setting.
<i>Sales Organization ID</i>	Keep the default setting.
<i>Distribution Channel ID</i>	Keep the default setting.
<i>Order Channel ID</i>	Keep the default setting.
<i>Product Hierarchy ID</i>	External ID of the product hierarchy.
<i>Location Hierarchy ID</i>	External ID of the location hierarchy.

7. Execute the modeling report.

Results

You can find the results of aggregated modeling for aggregation profile 0002 in the following output tables:

- /DMF/UMD_PAR: model parameters for the group of product locations
- /DMF/UMD_TS: model time series for the group of product locations
- /DMF/UMD_TSD: (if demand decomposition is enabled) decomposed model time series for the group of product locations

Use the 0002 Results to Model and Forecast the Demand for the Product Locations

Data Flow and Tables

You can define for each demand influencing factor (for example, a Boolean user DIF such as “Sunny Weather”) whether you wish to use the 0002 result as input (that is, as “prior value” to model the product location). If a 0002 result is not available, fallback values are used.

i Note

For more information on priors and on fallback values, see <https://help.sap.com/viewer/p/CARAB>
▶ <Version> ▶ Application Help ▶ SAP Customer Activity Repository ▶ Unified Demand Forecast ▶.

The system uses the data from the following tables:

Modeling Input

Table /DMF/UMD_PAR is used to get the parameter values of the aggregate entities (that is, the 0002 results).

Table /DMF/UMD_PAR_CFG is used to determine for which DIF the 0002 results should be used (field USE_PAR_OF_AGGR_PROFILE, *Use Par of Aggr Prof*).

Hierarchy Tables

The hierarchy tables are used to determine to which combinations of product group (prodDim) / location group (locDim) the product location belongs:

- /DMF/PROD_HR_ND
- /DMF/PROD_ND_XR
- /DMF/LOC_HR_ND
- /DMF/LOC_ND_XR

Modeling Output

Table /DMF/UMD_PAR contains the modeling results for the product locations.

Forecasting Input

Same as for modeling.

Forecasting Output

Table /DMF/UFC_TS contains the forecasting results for the product locations.

Procedure

1. Execute transaction SM34 and open view cluster /DMF/VC_MOD_DEF.
2. Select the desired demand model definition and choose *Demand Model Definition Details*. Switch to change mode.
3. For each *DIF ID* for which you wish to use the 0002 result, select 0002 in the *Use Par of Aggr Prof* column.
4. Save your changes.

i Note

To run modeling and forecasting for the product locations, use the *Schedule Model and Forecast* service in transaction **NWBC**.

Run modeling for the product locations.

The system checks for each product location whether it belongs to the specified combination of product group / location group for 0002. If the DIF is defined for the product location, the 0002 result is used as **prior value** to enhance the input for modeling.

Additionally, the **prior weight** is set to a high constant value to force the model parameter value of the product location DIF to be as close as possible to the prior value inherited from the aggregated data.

6. Run forecasting for the product locations.

More Information

For information about granular configuration options (configuration IDs) for modeling and forecasting, see the following:

- Feature details: <https://help.sap.com/viewer/p/CARAB> > <Version> > *Application Help* > *SAP Customer Activity Repository* > *What's New in SAP Customer Activity Repository* > *What's New in SAP Customer Activity Repository 3.0 FP1* > *Granular Configuration*
- Customizing: In transaction SPRO, see the *Maintain Model Profiles* and *Maintain Forecast Profiles* activities under > *Cross-Application Components* > *Demand Data Foundation* > *Modeling and Forecasting*.

4.3.15 Configure Demand Decomposition

Configure UDF to break down the modeled historical demand and the forecasted future demand by demand influencing factor (DIF). This “demand decomposition” shows you how much of the total value can be attributed to baseline business and how much is due to specific DIFs. Examples include offers, prices, tactics, public holidays, or seasonality.

Configuration Help

- Purpose:

→ Tip

Mainly, you should use the demand decomposition for support and troubleshooting purposes, that is, to analyze the modeling or forecasting results for a limited number of products. You can use the [Analyze Forecast](#) SAP Fiori app to visualize the decomposition results.

- Performance and sizing:

⚠ Caution

Depending on the scope of your business, the demand decomposition can create a large data set, and the original hardware sizing needs to be taken into account.

For sizing guidelines, see <https://help.sap.com/viewer/p/CARAB> >> <Version> > *Additional Information* > *Sizing (All Scenarios)* >.

For general information about sizing for SAP solutions, see <https://www.sap.com/about/benchmark/sizing.html>.

For performance recommendations, see [Optimize UDF Performance \[page 217\]](#).

Procedure

i Note

By default, the demand decomposition is disabled.

1. For performance considerations relating to the demand decomposition, see SAP Note [2483321](#).
2. Enable the generation of the decomposition time series (table /DMF/UMD_TSD) in Customizing (transaction **SPRO**):
 - For modeling: Navigate to >> *SAP Customer Activity Repository* > *Demand Data Foundation* > *Modeling and Forecasting* > *Define Modeling Control Settings* >. Execute the activity. Choose *New Entries*, enter MOD_OUTPUT_DECOMP as the *Configuration Type Code* and **x** as the *Configuration Value*.
 - For forecasting: Navigate to >> *SAP Customer Activity Repository* > *Demand Data Foundation* > *Modeling and Forecasting* > *Define Forecasting Control Settings* >. Execute the activity. Choose *New Entries*, enter FC_OUTPUT_DECOMP as the *Configuration Type Code* and **x** as the *Configuration Value*.

For more information, see the documentation of each activity.

4.3.16 Configure Holdout Forecasts

Holdout forecasts allow you to compare the generated forecast against the actual sales data. You withhold some of this data from being considered in the modeling and forecasting processes for that period, and then you compare the results to the actual sales data that was withheld.

Context

Holdout forecasts are best suited for measuring forecast accuracy in a proof-of-concept, pilot, or periodic analysis.

Holdout forecasts are only available in diagnostic mode and do not affect your production forecast results.

You perform holdout forecasts using the *Schedule Model and Forecast* Web Dynpro service. To access this service from your SAP Easy Access screen, execute transaction **NWBC** and choose >> *Services* > *Schedule Model and Forecast* >.

For more information about this service, see <https://help.sap.com/viewer/p/CARAB> » » [Application Help](#) » [SAP Customer Activity Repository](#) » [Unified Demand Forecast](#) » [General Services](#) » [Schedule Model and Forecast](#) ».

Prerequisites

For general prerequisites, see [Configure Unified Demand Forecast \(UDF\) \[page 186\]](#).

Execution

To perform a holdout forecast, follow these steps on the [Schedule Model and Forecast](#) screen:

1. Specify a *Diagnostic_ID* specific to your user.
2. Select a date for the *Model End Date* field based on the holdout period that you want to compare.
3. Model the selected products and locations.
4. Enter the *Forecast Horizon Start Date* for the holdout period and create a forecast.
5. The *Forecast Horizon Duration* defaults to 7 days. If desired, enter a value of **0 - 730** to override the default.

❖ Example

You have 1 year of historical sales data (actuals): from July 1, 2013 through June 30, 2014. You want to hold out 3 months of your actuals to assess the values that will be forecasted:

1. You create a diagnostic ID and set the scope for your test, specifying the products and locations.
2. You set the *Model End Date* to **March 31, 2014**, and the *Forecast Horizon Start Date* to **April 1, 2014**, with a duration of **90** days.
3. You run modeling and forecasting.
4. You validate the results against the actuals.

4.3.17 Configure Intraday Forecasts

To generate intraday forecasts, you must configure both the UDF module and the OSA module in SAP Customer Activity Repository. The daily forecasts (UDF) and the intraday distribution pattern (OSA) are combined into the intraday forecasts.

Procedure

1. For implementation and configuration information, see <https://help.sap.com/viewer/p/CARAB>
▶ <Version> ▶ Application Help ▶ SAP Customer Activity Repository ▶ Unified Demand Forecast ▶ General Services ▶ Generate Intraday Forecasts ▶.

4.3.18 Configure Forecast Confidence Index (FCI)

When you are planning offers and performing what-if forecasts in SAP Promotion Management, the FCI can help you determine the best offer terms and conditions. You can configure UDF to calculate the FCI when generating the what-if forecasts.

Use

⚠ Caution

The FCI should not be interpreted as a measure of the accuracy of the forecast compared to the actual sales. Instead, it is a measure of the **amount and quality of the statistical input data** based on which the forecast was generated.

You can use the FCI to identify issues in this input data. For example, a low FCI value might indicate that there is no sales history available for a particular offer type or offer combination. Or that there is no good “fit” between the generated demand model and the actual sales history.

i Note

SAP Promotion Management is the only consuming application for which the FCI can be calculated.

Configuration Help

FCI Output by Forecast Execution Mode

i Note

To get the values listed under *FCI Output*, you must previously activate their calculation in Customizing. For instructions, see the procedure below.

Forecast Execution Mode	FCI Output	Aggregated?	FCI Output Persisted?
SAP Promotion Management: what-if forecast	<ul style="list-style-type: none">FCI valueReasons for low FCIsFCI decomposition	Yes: by offer	Only on offer level in the offer financials details (table /DMF/OFR_FIN_DTL)
UDF: production forecast	<ul style="list-style-type: none">FCI valueFCI decomposition	No: You get one FCI value for each forecast value.	Yes (table /DMF/UFC_TS)

FCI Value

The calculated FCI value is always in the following range:

- 0: Low confidence in the forecast value based on the historical input data
- 1: High confidence in the forecast value based on the historical input data

Reasons for Low FCIs (What-If Forecasts Only)

The system can tell you which of the demand influencing factors (DIFs) considered for a particular what if forecast was most likely determinant in causing a low FCI. Once you know the reason for the low FCI, you can take corrective action. For example, you might decide to change the terms of a planned offer.

The reason for a low FCI is displayed in SAP Promotion Management. Examples include:

- Low FCI: Limited sales history*
- Low FCI: no or limited sales history for offer combination*
- Low FCI: High variability of sales history volume*
- Low FCI: Net price beyond confident historical range of average*
- Low FCI: Offer type has limited sales history*

FCI Decomposition (What-If Forecasts, Production Forecasts)

Let's assume you want to know what percentage of the calculated FCI was due to a deviation from the historical price. You can enable this FCI decomposition in Customizing (see procedure below). The system then generates the FCI decomposition time series and writes the results to the /DMF/UFCI_DECOMP output table.

Procedure

To configure UDF to calculate the FCI, do the following steps in Customizing (transaction **SPRO**):

1. Ensure that the full covariance matrix is generated during modeling. The full covariance matrix is mandatory for calculating the FCI:
 1. Open the Customizing activity *Define Modeling Control Settings* under **►► Cross-Application Components ► Demand Data Foundation ► Modeling and Forecasting**.
 2. Ensure that the *Configuration Type Code* MOD_COV_REDUCED is disabled for all the time series sources. That is, the *Configuration Value* for this parameter must be blank.

i Note

In modeling, the generated covariance matrix is written to the /DMF/UMD_PAR_COV table and used as input for forecasting.

In forecasting, the FCI value is determined for each forecast value and written to the /DMF/UFC_TS table together with the forecast results.

3. Save your changes.
2. (Optional) Define the values ranges for what constitutes a high, medium, and low FCI for your scenario:

i Note

There are no general recommendations on what should be a high, medium, or low range. The settings depend very much on the specific scenario and available data. To determine the best ranges for your scenario, consider performing a full modeling and forecasting run and analyzing the data.

1. Open the Customizing activity *Define Categories for Forecast Confidence Index* under **►► Cross-Application Components ► Demand Data Foundation ► Modeling and Forecasting**.
2. Read the Customizing activity documentation and define the value ranges as desired for your scenario.
3. Save your changes.
3. (Optional) Enable the generation of the FCI decomposition time series in forecasting:
 1. Open the Customizing activity *Define Forecasting Control Settings* under **►► Cross-Application Components ► Demand Data Foundation ► Modeling and Forecasting**.
 2. Choose *New Entries*.
 3. Add a new entry with the following settings:
 - *Configuration Type Code*: **FC_OUTPUT_FCI**
 - *Configuration Value*: **x**

i Note

The default setting is 'P' (partially enabled). For information, see the FCI-specific parameters in [Configure Parameters for Forecasting \[page 206\]](#). Search for *FCI*.

- Select a *Time Series Source*.
 - (Optional) Specify a *Diag ID* and/or *Config ID*.
4. Save your changes.

4.3.19 Configure Modeling and Forecasting by Tactic Type

In trade management scenarios, for example, you might want to generate forecasts by tactic type only, to be able to assess the effect of different tactic types in general before creating actual promotions.

Procedure

1. First activate modeling by tactic type.
 1. In Customizing (transaction **SPRO**), navigate to ► *Cross-Application Components* ► *Demand Data Foundation* ► *Modeling and Forecasting* ► *Define Modeling Control Settings* ► and execute the Customizing activity.
 2. Choose *New Entries*.
 3. Enter **MOD_TACTIC_TY_ONLY** as the *Configuration Type Code*.
Enter **x** as the *Configuration Value*.
 4. Fill in the other fields as required for your scenario.
 5. Save your changes.
2. Run modeling.
3. Run forecasting.

Result

Modeling outputs a special tactic type effect parameter for the product-location combination. This parameter is an arithmetic average of all the tactics belonging to that type.

Forecasting averages the product-location-specific history of promotions to give an average forecast by tactic type.

4.4 Optimize OAA Performance

Get recommendations on how to optimize OAA performance with regard to availability calculation and sourcing, for example by checking the setup of the server group used for the parallelized ATP run, by deleting outdated data, or by putting additional load on the system where absolutely required only.

Check Release Information Notes (RINs) for Latest Performance Corrections

Since your version of SAP Customer Activity Repository applications bundle was released, new performance enhancements and corrections might have become available. For up-to-date information, check the release-specific RINs. There is always a RIN for the back-end and a RIN for the front-end.

See SAP Help Portal at <https://help.sap.com/viewer/p/CARAB>, select your version at the top right, and consult the RINs under *Installation And Upgrade*.

Deactivate Standard ATP Check

For more information, see [Deactivating Standard ATP Check](#).

Optimize Generation of ATP Snapshot

Add a sufficient number of servers to the group of servers on which the parallelized ATP run is executed.

We recommend to schedule two different jobs for the ATP snapshot generation report:

- One job for the full run, to be executed for example once a day
- One job for the delta run (select *Delta Mode* field), to be executed for example every hour

For more information, see [Generating and Replicating ATP Snapshot \(Sales Channel Mode\)](#), or see [Generating and Replicating ATP Snapshot for DC Articles \(OAA Profile Mode\)](#) and [Generating and Replicating ATP Snapshot for Vendor Articles \(OAA Profile Mode\)](#).

Use Rough Stock Indicator Logic

The rough stock indicators are calculated in SAP Customer Activity Repository, from where they are replicated via IDoc to SAP Commerce in the form of a static RSI snapshot; this snapshot reflects the availability situation at creation time and is not updated in real time but only at regular intervals. Implementing RSI logic improves performance greatly for situations where detailed real-time information is not an absolute must.

Create a custom implementation of BAdI /OAA/BADI_ATP_RSI_GENERATION. The fallback implementation in the standard delivery is not suited for handling large data volumes.

In addition, we recommend to execute initial replication of RSI information for all articles once only. Then, with all further runs of the replication report, select the field *Send RSI Category Changes Only* to restrict the replication to those articles only where the RSI category has changed, for example, articles where the traffic light color has changed from green to yellow (delta replication). If the available quantity of an article changes but the assigned RSI category is still the same, this article is ignored.

For more information, see [Rough Stock Indicators](#) and [Replicating Rough Stock Indicators from SAP CAR to SAP Commerce](#).

Use Sourcing in Checkout Only

In the standard delivery, availability information is aggregated on different levels, depending on how far the online store customer has advanced in the ordering process. The more advanced he or she is, the more

accurate the availability information and sourcing information gets. This staggered approach improves performance greatly for situations where detailed information is not an absolute must.

You can modify the aggregation levels or modify the point in time when they are applied, by modifying the SAP Commerce extensions that connect the back-end logic in SAP Customer Activity Repository via REST APIs to the SAP Commerce front end. However, we recommend to stick to the standard implementation where sourcing is only executed as soon as the online customer goes to checkout, not before.

For more information, see [Aggregation of Availability Information](#) and [Sourcing](#).

Optimize Execution of Multiple Sourcing Strategies

You can use BAdI /OAA/SRC_FRW (BAdI: Sourcing Framework), method DETERMINE_SOURCING_STRATEGIES to determine which sourcing strategies are used in which sequence when sourcing is executed for an online order, and under which conditions. This method allows using multiple sourcing strategies in a defined sequence and brings full flexibility into the sourcing logic.

As a default, the system always executes all sourcing strategies. To improve performance, execution is always parallelized on a server group. Make sure that the number of available work processes meets your custom requirements.

For more information, see [Sourcing Strategy Determination \(Sales Channel Mode\)](#).

Optimize Tracing

Activate the header trace only (transaction /OAA/SRC_TRACE_ACT). This allows you to trace important data on cart level while at the same time still keeping the trace data volume and the impact on system performance low. Activating the full trace or the details trace for failed sourcing only allows you to trace sourcing details on sourcing strategy level, with the disadvantage of increased trace data volume and reduced system performance.

Keep tracing on for a limited period of time only, depending on your business reasons. Deactivate tracing when it is not needed any more, by removing the trace level entry (transaction /OAA/SRC_TRACE_ACT).

For more information, see [Tracing of Sourcing Information \(Sales Channel Mode\)](#).

Delete Outdated Entries from Various Tables

We recommend executing the following reports to delete outdated entries from various tables and improve system performance:

System	Report Name	Report Description
SAP CAR	/OAA/ATP_SNAPSHOT_DELETION	<i>Deletion of Outdated Entries in ATP Snapshot</i>

System	Report Name	Report Description
SAP CAR	/OAA/ATP_RESV_DELETION	<i>Deletion of Temporary Reservations</i>
SAP CAR	/OAA/ATP_DELTA_CLEANER	<i>Clean-Up of ATP Delta Tables</i>
SAP S/4HANA or SAP Retail	OAA_VEND_STOCK_DELETION	<i>Deletion of Outdated Entries in Uploaded Vendor Stock Information</i>
SAP CAR	/OAA/SRC_TRACE_DELETION	<i>Deletion of Outdated Sourcing Traces</i>
SAP S/4HANA	OAA_CLEAN_DELTA_TABLE (SAP S/4HANA 1909 only)	<i>Deletion of Outdated Entries in ATP Delta Tables</i>
SAP CAR	/OAA/SOURCE_DELETION	<i>Deletion of OAA Data Related to Invalid Sources</i>
SAP CAR	/OAA/MIGRATED_DATA_DELETION	<i>Deletion of Migrated Data for ATP Snapshot and Reservations</i>

For more information, see the section on reports in this document: <https://help.sap.com/viewer/e95c8443f589486bbfec99331049704a/4.latest/en-US/14c0d39a5eaa48849e04328c11e36004.html>.

Mitigate Performance-Related Security Risks

For more information, see [Security for Omnichannel Article Availability and Sourcing \[page 95\]](#).

4.5 Set Up SAP Fiori Apps for SAP Customer Activity Repository

SAP Customer Activity Repository includes multiple apps that support different scenarios and consuming applications. For a full list of these apps, see the **SAP Fiori for SAP Customer Activity Repository** section of the application help for SAP Customer Activity Repository.

For setup instructions, see the *Set Up SAP Fiori Apps for SAP Customer Activity Repository* section of the *Common Installation Guide* at <https://help.sap.com/viewer/p/CARAB>.

5 Operation

5.1 Monitoring

Within the management of SAP Technology, monitoring is an essential task.

You can find more information about the underlying technology in the SAP Help Portal for SAP NetWeaver at <http://help.sap.com/netweaver> > <your release> > *System Administration and Maintenance Information* > *Technical Operations for SAP NetWeaver* >.

5.1.1 Alert Monitoring

Proactive, automated monitoring is the basis for ensuring reliable operations for your SAP system environment. SAP provides you with the infrastructure and recommendations needed to set up your alert monitoring to recognize critical situations for SAP Customer Activity Repository as quickly as possible.

Component-Specific Monitoring

i Note

Component-specific monitoring via CCMS is not supported for software component `RTL CAR 300`. Alternative monitoring possibilities are described below.

For software component `RTL DDF 300` which encompasses the Demand Data Foundation (DDF) and Unified Demand Forecast (UDF) modules, you can use the *SAP DMF* monitor set for *Computing Center Management System (CCMS)* monitoring.

The *SAP DMF* monitor set displays the monitoring hierarchy of the following UDF services (transaction `RZ20`):

Services and Processes for CCMS Monitoring

Services	Monitoring Tree Elements (MTEs, nodes)
Model by hierarchy	DMF_MODEL_PROCESSES_BY_HIER
Model by product location	DMF_MODEL_PROCESSES_BY_PROD_LOC

Services	Monitoring Tree Elements (MTEs, nodes)
Forecast by hierarchy	DMF_FORECAST_PROCESSES_BY_HIER
Forecast by product location	DMF_FORECAST_PROCESSES_BY_PROD_LOC
Calculate hierarchical priors	DMF_CALCULATE_HIER_PRIORS

Note

A node may display the *MTE class: No MTEs currently available* message. This message indicates that the associated UDF service has not yet been run on this system to generate the *Monitoring Tree Elements* for this node.

Monitoring of SAP HANA

You can monitor SAP HANA through SAP HANA studio or SAP Solution Manager.

SAP HANA Studio

The System Monitor in SAP HANA studio provides an overview of SAP HANA systems with information such as the operational state, alerts generated, disk size for data, log and trace, memory used, percentage of CPU being used, and so on. For more detailed monitoring of resource usage and performance for a particular SAP HANA system, please use the Administrator Editor.

For information about the installation and general monitoring and administration of SAP HANA, and about the use of SAP Solution Manager with SAP HANA studio, see SAP Help Portal for SAP HANA Live at <http://help.sap.com/hba> ► *Installation, Security, Configuration, and Operations Information* ► *Administrator's Guide* ►.

For more information about monitoring SAP HANA systems using SAP HANA studio, see SAP Help Portal for SAP HANA Platform at http://help.sap.com/hana_appliance ► *System Administration* ► *SAP HANA Administration Guide* ►.

SAP Solution Manager

SAP Solution Manager can also be used for basic administration and monitoring of SAP HANA systems within SAP landscapes. SAP HANA integrates into existing operations with little effort if SAP Solution Manager is already in use. It is highly recommended to use SAP Solution Manager Release 7.1 SP05 or higher in order to get optimal support for SAP HANA. The monitoring and alerting infrastructure of SAP Solution Manager is based on central agent infrastructure. Pre-configured agents for SAP HANA are delivered by SAP. Once the agents are deployed on SAP HANA and connected to SAP Solution Manager, SAP Solution Manager will receive all alerts of the HANA studio. For larger and more complex landscape scenarios, SAP Landscape and Virtualization Manager (LVM) integrates with SAP HANA to allow basic operations like starting and stopping as well as management of dependencies.

For more information about connecting SAP Solution Manager to SAP HANA, see the *SAP HANA Technical Operations Manual* on SAP Help Portal for SAP HANA Appliance Software at http://help.sap.com/hana_appliance ► *System Administration* ► *SAP HANA Technical Operations Manual* ►. See also SAP Service Marketplace at <http://support.sap.com/solutionmanager> ►.

For more information about SAP Solution Manager, see SAP Help Portal for Solution Manager at <https://help.sap.com/solutionmanager>.

Monitoring of SAP Customer Activity Repository

Monitoring for the POS Data Management component in SAP Customer Activity Repository consists of the following:

- POS DM Application Log
- POS DM Message Log
- Auditor Report
- Trace and Log files (accessed using transaction `SLG1` to log and trace ABAP components)

Monitoring of the SAP Landscape Transformation Replication Server

If you are replicating data from other source systems, monitoring of the SAP Landscape Transformation (LT) Replication Server is essential to ensure data consistency between the source system (for example, SAP ERP) and SAP Customer Activity Repository. The *Configuration and Monitoring Dashboard* (transaction `LTR` in the SLT server) provides users with information that can be used to monitor and identify potential replication issues. The overview screen provides the overall status of the configurations. For each configuration, detailed information is provided, which includes statuses of jobs and connections, statuses of database triggers for tables selected for replication, and statistical information about tables and settings.

As of release DMIS_2010 SP07 on the SAP LT Replication Server, you can use system monitoring capabilities of SAP Solution Manager 7.1 (SP05 or higher) to monitor the status of a configuration and its related schema.

For more information about monitoring load and replication process, see SAP Help Portal at <http://help.sap.com/hana> ► [SAP HANA Options](#) ► [SAP HANA Real-Time Replication](#) ► [SAP HANA Trigger-Based Data Replication Using SAP LT Replication Server](#) ► [System Administration and Maintenance Information](#) ► [Configuration Information and Replication Concepts](#) ► [Monitoring of Load and Replication Process](#) ►

5.1.2 Data Consistency

SLT Replication

Data can be optionally replicated from SAP ERP and from SAP CRM to SAP Customer Activity Repository. If you replicate data, the information in the replicated tables must be consistent between the source and the target systems.

⚠ Caution

You can monitor the processes of the SAP Landscape Transformation (SLT) Replication server using the *Configuration and Monitoring Dashboard*, as specified in the [Alert Monitoring \[page 258\]](#) section. However,

the dashboard does not currently provide an automated way to monitor the consistency of replicated tables. When performing SLT replication, you must verify that all the tables required for your SAP Customer Activity Repository implementation, as well as their contents, are being replicated.

For more general information about deployment options and data replication into SAP Customer Activity Repository, see the *Common Installation Guide* for your release at <https://help.sap.com/viewer/p/CARAB>

► [Installation and Upgrade](#) ►

Master Data Checking

The system automatically executes the master data checks that you created in the Customizing for POS Inbound Processing.

The master data checks are processed in the following situations:

- During the inbound processing of POS transactions
- When the editor is started for a particular POS transaction within the POS Workbench
- When tasks are processed

The system checks for POS transaction data and automatically enhances it with further data. If there is no valid master data in the system, the master data check fails and a corresponding error message is displayed. There is no further processing of the affected POS transaction within the task processing.

If all checks and data enhancements are successful, the system continues executing the functions, without interruption, according to the guidelines prescribed by which checks were already performed.

You can also check transaction data when executing processing tasks using rules that you have created in Customizing (transaction **SPRO**) under ► [POS Inbound Processing](#) ► [Tasks](#) ► [Define Rules](#) ►. Once you have created a rule, you can execute a specific activity depending on the result you receive. You create rules when you want to process tasks only if certain conditions are met.

ABAP Shared Memory Objects

The POS Data Management component of SAP Customer Activity Repository includes functionality to verify master data in the transactions received from the point-of-sale.

Retrieving master data from database tables through SAP HANA views to perform master data checks for Material, Unit of Measure, and International Article Number (EAN) can result in slower system performance, especially in situations when the number of master data records is high. To improve system performance, the implementation of the master data retrieval uses ABAP shared memory objects to buffer the contents of the master data tables in a shared memory area of the SAP NetWeaver application server. After the initial load of the shared memory objects, instead of going to the database to retrieve the required data, the data is retrieved from the shared memory objects, thereby providing faster data retrieval.

Each version of a shared memory object becomes obsolete 60 minutes after a change lock is released, and the application server performs an automatic refresh from the database.

[Shared Objects Area Management](#) (transaction **SHMA**) is used to display areas for shared objects and their properties.

Shared Objects Monitor (transaction SHMM) provides an overview of the area instances in the shared objects memory of the current application server, and offers selected functions for it.

The following area instances in the shared object memory are relevant for SAP Customer Activity Repository:

Shared Memory Object Area	Description
<ul style="list-style-type: none"> • /POSDW/CL_MATERIAL_BUFFER_AREA • /POSDW/CL_MARM_BUFFER_AREA • /POSDW/CL_MEAN_BUFFER_AREA 	<p>The POS Data Management component of SAP Customer Activity Repository includes functionality to verify master data in the transactions received from the point-of-sale. Master data checks for Material, Unit of Measure, and International Article Number (EAN) retrieve master data from database tables through SAP HANA views. The listed shared memory object allow faster access to this data.</p>
<ul style="list-style-type: none"> • /POSDW/CL_POSCTRL_BUFFER_AREA 	<p>Implementation /POSDW/ANALYTIC_DIST_ENH_IMP of <i>BAdI: POS Transaction Data Distribution to Item Level</i> distributes discount amounts from the transaction header to the transaction line items. This BAdI implementation uses the listed shared memory object to speed up access to SAP HANA view <code>sap.is.retail.ecc.ARTICLEPOSCTRL</code>, which contains information on whether an article is discountable or not.</p>

Additional general information about ABAP shared memory objects can be found in the SAP NetWeaver application help at http://help.sap.com/saphelp_nw70/helpdata/en/df/109b8b4b073b4c82da0f2296c3a974/frameset.htm.

Shared Memory Object Size

Every retail business is different, and as such, the amount of master data, such as the number of articles, or unit of measure definitions, is also different. The amount of memory required to buffer this master data at the application server level varies from business to business.

To set the size of shared memory, do the following:

1. Execute transaction RZ11 in your SAP Customer Activity Repository system.
2. Enter **abap/shared_objects_size_MB** as the parameter name and choose *Display*.
3. In the *Maintain Profile Parameters* screen, choose *Change Value* or **▶ Edit ▶ Change Value ▶** (depending on your SAP NetWeaver version).
4. Enter the appropriate shared memory size, in MB, in the *Current Value* field.
We recommend setting the shared memory size to at least 300 MB. Out of this 300 MB, 10-20% is reserved for the internal administration of shared memory.
For more information on troubleshooting shared memory sizing issues, see the following subsection as well as SAP Note [1322182](#).
5. Restart the application server.
Changes to shared memory size only take affect once the application server is restarted.

Troubleshooting Shared Memory Object Issues

- **Shared Memory Object Sizing Issues**

Typically, a runtime error caused by a Runtime errors that are related to the use of shared memory objects that can occur are as follows: `CX_SHM_OUT_OF_MEMORY` exception, indicates that an insufficient amount of memory is allocated to shared memory.

If your SAP Customer Activity Repository application is terminated as a result of a `CX_SHM_OUT_OF_MEMORY` exception, verify the *Runtime Error Long Text* provided with the runtime error (this can also be accessed using transaction `ST22`). The long text provides the size of the objects that the application was attempting to load into one of the `/POSDW/CL_*_BUFFER_AREA` shared memory objects. You should increase the size of shared memory, as described in the previous subsection, by at least this amount, plus an additional 10-20% buffer required for administrative activities.

For example, `abap/shared_objects_size_MB` is currently set to 300 MB. Your SAP Customer Activity Repository application produces a runtime error, indicating that 500 MB fails to load into the `/POSDW/CL_MATERIAL_BUFFER_AREA`. You should increase the size of `abap/shared_objects_size_MB` from 300 MB to 850-900 MB and restart the system.

- **Shared Memory Area Initialization Delays**

When SAP Customer Activity Repository performs master data checks to verify material, unit of measure, and International Article Number (EAN) data, the system verifies the data included in the received POS transactions against the data buffered in the shared memory objects (`/POSDW/CL_MATERIAL_BUFFER_AREA`). Runtime errors that are related to the use of shared memory objects that can occur are as, `/POSDW/CL_MARM_BUFFER_AREA`, `/POSDW/CL_MEAN_BUFFER_AREA`. If the master data check occurs prior to the initialization of the shared memory area, this can result in a runtime error caused by a `CX_SHM_NO_ACTIVE_VERSION` exception.

The time required to initialize the shared memory area (that is, the time required to load master data from the database tables into the dedicated shared memory objects) is controlled by the `SHM_MAXIMUM_PRELOAD_WAIT_TIME` component of the `SETTINGS` parameter used by the `CALL` method of `BAdI /POSDW/SETTINGS`. By default, `SHM_MAXIMUM_PRELOAD_WAIT_TIME` is set to 10 seconds. If you are experiencing runtime errors caused by a `CX_SHM_NO_ACTIVE_VERSION` exception, you may need to increase the value of `SHM_MAXIMUM_PRELOAD_WAIT_TIME` to allow for a longer period to initialize the shared memory area.

For more information, see SAP Note [1965920](#).

Staging Tables

External data providers write data into the staging tables. During a Remote Function Call (RFC), the data providers can additionally provide a high resolution time stamp.

Every data record in the staging tables has a high resolution time stamp (field `EXT_KEY_TST`). The time stamp is part of the data record key. As a result, different records for the same object can exist in the table at any given point in time. When processing the data from the staging tables, the newest data record of each object is used.

Authorization Checks

The system performs authorization checks on the following function groups:

- `/DMF/BI_SALES_INBOUND` (*Inbound RFC for BI Sales Data*)

- /DMF/MDIF_IMAGE_DATA (*DMF Inbound RFC Image Data*)
- /DMF/MDIF_LANE (*DMF Inbound RFC Lane Data*)
- /DMF/MDIF_LOCATION (*DMF Inbound RFC Location*)
- /DMF/MDIF_LOC_HIER (*DMF Inbound RFC Location Hierarchy*)
- /DMF/MDIF_PRODUCT (*DMF Inbound RFC Product*)
- /DMF/MDIF_PROD_HIER (*DMF Inbound RFC Product Hierarchy*)
- /DMF/MDIF_PROD_LOC (*DMF Inbound RFC Product Location*)
- /DMF/OPIF_INVENTORY (*Inbound Staging Modules for Inventory*)
- /DMF/TS_GENERIC_INBOUND (*Inbound RFC for Generic Time Series*)
- /DMF/DISTRIBUTION_CURVE (*Distribution Curve Function Group*)

Data Validation for Modeling and Forecasting

You can run a data validation report prior to performing demand modeling and forecasting with the Unified Demand Forecast (UDF) module in SAP Customer Activity Repository. This allows you to identify potential issues in your input data early on and rectify them as needed. For more information about this report, see SAP Note [2161484](#).

5.1.3 Detailed Monitoring and Tools for Problem and Performance Analysis

Use

The following functions are available within SAP Customer Activity Repository to monitor the data flow:

- /POSDW/LOGS - POS Data Management Application Log
- /POSDW/DISPLAY_MESSAGELOG - POS Data Management Message Log
- /POSDW/DISPLAY_MODIFICATIONS - Auditor Report

POS Data Management Application Log

The POS Data Management Application Log collects messages, exceptions, and errors, and displays them in a log.

This log provides you with basic header information, a message long text, detailed information, and technical information. For more information, see SAP Help Portal for SAP NetWeaver at https://help.sap.com/viewer/p/SAP_NETWEAVER > <Version> > Application Help > SAP NetWeaver Library: Function-Oriented View > Application Server > Application Server ABAP > Other Services > Services for Business Users > Application Log - User Guidelines (BC-SRV-BAL).

POS Data Management Message Log

The POS Data Management Message Log displays message logs by store and by posting date. You can filter the report by message-related criteria, such as message class or message priority.

Auditor Report

You use the Auditor Report to track manual changes made to POS transactions, as well as to get information about the origin of the transactions, such as the POS Workbench, an IDoc, or a remote function call (RFC) module.

Trace and Log Files

Trace files and log files are essential for analyzing problems. Transaction **SLG1** is used to log and trace ABAP components. An *Application Log* consists of a log header and a set of messages. The log header contains general data, such as type, created by/on, and so on. Each log in the database also includes the attributes *Object* and *Subobject*. These attributes are used to describe and classify the application that has written the log.

Important Log and Trace Files of the SAP Customer Activity Repository (RTLCAR) Component

Object	Subobject	Description
/POSDW/PIPE	CHANGE_TASKSTATUS	Task status change
/POSDW/PIPE	CREATETREX	TREX index generation
/POSDW/PIPE	CREDITCARD_MIGRATION	Migration of encryption of credit card numbers
/POSDW/PIPE	DELETE	Delete program
/POSDW/PIPE	DELETE_PLOG	Delete Process Log Entries
/POSDW/PIPE	DELETE_TLOGUS	Delete Program for Unprocessed Sales
/POSDW/PIPE	DELETE_AGGREGATE	Deletion program for POS aggregates
/POSDW/PIPE	IDOCDISPATCHER	IDoc dispatcher
/POSDW/PIPE	INBOUND_DISPATCHER	Initial processing using queue
/POSDW/PIPE	OUTBOUND_DISPATCHER	Outbound processing for POS aggregates
/POSDW/PIPE	PIPEDISPATCHER	POS dispatcher
/POSDW/PIPE	REFRESH_INDEX	Reconstruction of transaction index
/POSDW/PIPE	REORG_TIBQ	Reorganization of TIBQ
/POSDW/PIPE	STOREDAYCHANGE	POS Data Key change
/POSDW/PIPE	XML_IN	Import POS Transactions as XML file
/POSDW/PIPE	XML_OUT	Export POS Transactions as XML file
/POSDW/PIPE	MAINTAIN_PARTITIONS	Maintain POS Transaction Table - Level 2 Range Partitions

Object	Subobject	Description
/POSDW/PIPE	REFRESH_EXTENSIONS	Migration of Customer Enhancement Extension Segments
/POSDW/PIPE	RESTORE_ARCHIVE	Restore archived TLOG entries
/POSDW/PIPE	TLOG_MIGRATION	POS Transaction Data Migration

Important Log and Trace Files of SAP Customer Activity Repository (RTLCAR) Component

Object	Subobject	Description
/POSDW/PIPE	OSADISPATCER	Status of the execution of the <i>On-Shelf Availability Parallel Processing of Alerts</i> report.

For more information, see https://help.sap.com/viewer/p/SAP_NETWEAVER >> <Version> > *Application Help* > *SAP NetWeaver Library: Function-Oriented View* > *Application Server* > *Application Server ABAP* > *Other Services* > *Services for Business Users* > *Application Log - User Guidelines (BC-SRV-BAL)* >.

Archiving

Archiving of Data Used by SAP Customer Activity Repository

If you replicate data from other source systems to SAP Customer Activity Repository using SLT replication, the replicated data follows the data lifecycle of the source system. As such, when data is archived on the source system, it is deleted from the repository. Similarly, if you access data of other source systems directly from the repository (possible when the repository is co-deployed with the source system on the same SAP HANA database), you do not have access to archived data.

For example, if you archive sales documents in SAP ERP (for example, for performance reasons), these sales documents will no longer be available in SAP Customer Activity Repository. This could affect your reports if you choose to have a short lifecycle of sales documents in SAP ERP. For example, if you archive sales documents after nine months, a year-to-date multichannel sales analysis report in December would miss the sales documents data for most of the first quarter.

For more information on deployment options for SAP Customer Activity Repository, see the *Common Installation Guide* (for new installations) or the *Common Upgrade Guide* (for upgrade scenarios). You can find both guides on SAP Help Portal under <https://help.sap.com/viewer/p/CARAB> >> <Version> > *Installation and Upgrade* >.

Data Growth and Data Archiving Monitors

The following are the fastest growing tables in SAP Customer Activity Repository:

Technical Name of Table	Description
/POSDW/TLOGF	Transaction Log Flat table
/POSDW/TLOGF_EXT	Transaction Log Extensions table

Technical Name of Table	Description
/POSDW/TLOGF_X	Transaction Log Optimized Extensions table
/POSDW/TIBQ	Inbound Queue for POS Transactions
/POSDW/TIBQ_ADM	Management Records of Inbound Queue for POS Transactions
/POSDW/SOBJL	Source Object Link for POS Transactions
/POSDW/PLOG1S	Processing Log for Small Logs
/POSDW/TSTAT	Areas of Task Status
/POSDW/NAVIX	Navigation Index for Store and Day
/POSDW/AGGR	POS Aggregate

You can use the SAP HANA studio to identify which tables use the most disk space. To verify the amount of disk space used by a table, do the following:

1. Log on to SAP HANA studio.
2. Locate the name of your system in the *Navigator* pane.
3. Right-click on your system name and select *Administration* from the context menu.
4. Select the *System Information* tab.
5. Select the *Size of tables on disk* entry.

The tables are displayed with their corresponding disk usage values.

SAP Customer Activity Repository uses the standard archiving and monitoring data archiving tools available in SAP NetWeaver. It does not require any application-specific tools. There are two relevant archiving objects: /POSDW/AGG and /POSDW/TLF.

The following SAP Notes relate to data growth and archiving in SAP Customer Activity Repository:

- [813537](#) (General notes about archiving POS data)
- [625081](#) (Archiving objects and namespace)

For more information about the standard archiving tools, see the SAP Help Portal for SAP NetWeaver at https://help.sap.com/viewer/p/SAP_NETWEAVER >> <Version> > *Application Help* > *SAP NetWeaver Library: Function-Oriented View* > *Solution Lifecycle Management* > *Data Archiving* > *Data Archiving in the ABAP Application System* > *Data Archiving with Archive Development Kit (ADK)* > *Archive Administration*.

Data Load After a Reboot

When you reboot an SAP NetWeaver powered by SAP HANA system, all data that was stored in-memory is lost, and must be reloaded from the permanent persistency layer of the SAP HANA database. After the reboot, the first time you run the SAP Customer Activity Repository application, you may experience significant delays as the application reloads tables such as /POSDW/TLOGF or /POSDW/NAVIX for the first time.

To avoid these delays, it is recommended that you reload all POS Data Management tables with high disk space usage in the following instances:

- Immediately following the reboot of your SAP NetWeaver powered by SAP HANA system

- Prior to launching the SAP Customer Activity Repository application.

First, you must identify which tables use the most memory. See the *Data Growth and Data Archiving Monitors* section above.

Then, for each table, run the following SQL command to load the table from the permanent persistency layer into main memory:

```
load <SAP_SCHEMA>."<TABLE_NAME>" all
```

<SAP_SCHEMA> is the name of your SAP HANA database schema and <TABLE_NAME> is the name of the table to load. You can verify the database schema of a particular table in SAP HANA studio using the same process you use to verify table disk space usage.

You can also create an SQL script that will be automatically executed following an SAP NetWeaver powered by SAP HANA system reboot. You can use the SAP HANA studio SQL Editor to create this script, or, you can create an ABAP report which will include the following commands:

```
EXEC SQL.
load <SAP_SCHEMA>."<TABLE_NAME1>" all.
load <SAP_SCHEMA>."<TABLE_NAME2>" all.
load <SAP_SCHEMA>."<TABLE_NAME3>" all.
...
ENDEXEC.
```

More Information

For detailed monitoring information about the underlying components of SAP Customer Activity Repository, see the following:

Reference	Path	Important Sections or Topics (If Applicable)
Technical Operations for SAP NetWeaver	For more information about the standard archiving tools, see SAP Help Portal for SAP NetWeaver at https://help.sap.com/viewer/p/SAP_NETWEAVER >> <Version> > Operations > Technical Operations for SAP NetWeaver > Administration of Application Server ABAP > Monitoring and Administration Tools for Application Server ABAP >.	<ul style="list-style-type: none"> • Statistics, Displaying and Controlling Work Processes (SM50) • System Log (SM21) • ABAP Dump Analysis

Reference	Path	Important Sections or Topics (If Applicable)
SLT System Administration and Maintenance Information	See SAP Help Portal for SAP HANA Platform at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM >> <Version> > Security > SAP HANA Security Guide > Security for SAP HANA Replication Technologies > Trigger-Based Data Replication Using SAP LT (Landscape Transformation) Replication Server (SLT) >.	Changing Load and Replication Procedures
SAP HANA Administration Guide	See SAP Help Portal for SAP HANA Platform at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM >> <Version> > Administration > SAP HANA Administration Guide >.	Monitoring SAP HANA Systems

5.1.4 Detailed Monitoring and Analysis Tools Specific to On-Shelf Availability

The following function is available to monitor the OSA-specific data flow within the application:

- /POSDW/LOGS: SAP POS DM Application Log
The SAP POS DM Application Log collects messages, exceptions and errors, and displays them in a log. This log provides you with basic header information, a message long text, detailed information, and technical information.
For more information, see the SAP Library Help at <http://help.sap.com/nw74/> >> Application Help > Function-Oriented View > Application Server > Application Server ABAP > Other Services > Services for Business Users > Application Log - User Guidelines (BC-SRV-BAL) >.

Trace and Log Files

Trace files and log files are essential for analyzing problems. The `SIG1` transaction is used to log and trace ABAP components. An application log consists of a log header and a set of messages. The log header contains general data, such as type or created by/on data. Each log in the database also includes the attributes Object and Sub-Object. These attributes are used to describe and classify the application that wrote the log.

Object	Sub-Object	Description
/POSDW/PIPE	OSADISPATCER	Status of the execution of the On-Shelf Availability Parallel Processing of Alerts report.

For more information, see the SAP Library Help at <http://help.sap.com/nw74/> >> Application Help > Function-Oriented View > Application Server > Application Server ABAP > Other Services > Services for Business Users > Application Log - User Guidelines (BC-SRV-BAL) >.

Cleanup of growing data

OSA computation data is historized, that is stored with the execution date and time and used in the analysis step of On-Shelf Availability processing. Because of growing data amounts, SAP recommends to perform a clean-up in regular intervals. The transaction `/OSA/CLEANUP` deletes OSA computation data from the SAP HANA Database.

In the `/OSA/CLEANUP` transaction, you can specify the following parameters:

- The range of stores for which you want to perform the cleanup
- The date range for which you want to perform the cleanup
- Test mode:
 - If test mode is activated, selected data will be only listed but not deleted
 - If test mode is deactivated, selected data will be deleted
- Detail level of the messages that will be logged during the cleanup

`/OSA/CLEANUP` deletes OSA computation data together with run information from the following OSA tables:

- `/osa/mon_ana`
- `/osa/mon_ana_sum`
- `/osa/ana_conf`
- `/osa/estimat`
- `/osa/est_conf`
- `/osa/iw_pattern`
- `/osa/iwp_conf`
- `/osa/monitoring`
- `/osa/mon_sum`
- `/osa/mon_conf`

The user who executes cleanup needs read and write privileges for the tables that are deleted during cleanup.

Data Growth and Archiving the Monitor Results

The `/OSA/STATUSLOG` table is the fastest growing OSA table.

Use the `SARA` transaction to archive the `/OSA/STATUSLOG` table in regular intervals.

The On-Shelf Availability functionality uses the standard archiving and monitoring data archiving tools available in SAP NetWeaver. It does not require any application-specific tools. The relevant archiving object is `/OSA/STATU`.

For more information regarding the standard archiving tools, see the SAP Library Help at <http://help.sap.com/nw74/> > *Application Help* > *Function-Oriented View* > *Solution Lifecycle Management* > *Data Archiving* > *Data Archiving in the ABAP Application System* > *Data Archiving with Archive Development Kit (ADK)* > *Archive Administration* > .

5.1.5 Detailed Monitoring and Analysis Tools Specific to Demand Data Foundation

Preparing Exception Handling

The Demand Data Foundation (DDF) module in SAP Customer Activity Repository uses the exception handling framework to log errors that have occurred during background processes.

The exception definition is based on the general ABAP message concept. Each exception is identified by the combination of a message class and a message number. Each instance of an exception has a unique internal ID (message handle).

For more information about the exception handling framework, see SAP Help Portal at <http://help.sap.com/viewer/p/CARAB> > > <your release> > Application Help > Demand Data Foundation > General Services > Monitor Exceptions >.

i Note

There are subobjects that do not use the exception handling framework. For more information on how you can monitor these subobjects, see the *Analyzing Application Logs* section.

Configuring Exceptions

Before actual exception instances can be created, you must first configure the exceptions in Customizing (transaction **SPRO**). To do this, you use the activities under >> *Cross-Application Components* > *Demand Data Foundation* > *Basic Settings* > *Exception Management* >.

For more information, see the following:

- System documentation of each activity
- Section *Customizing* under <http://help.sap.com/viewer/p/CARAB> > > <your release> > Application Help > Demand Data Foundation > General Services > Exception Management >.

High-Level Exceptions

You can configure high-level exceptions under >> *Cross-Application Components* > *Demand Data Foundation* > *Basic Settings* > *Exception Management* > *Maintain Configuration Data for High Level Exceptions* >.

You can do the following:

- Assign business areas to exceptions (such as *Forecasting*)
- Assign priorities to exceptions (such as *Medium Priority*)
- Define message types (such as *Error*, *Warning*, *Information*)
- Define validity periods after which the exceptions can be purged from the database

Low-Level Exceptions

Additionally, you can assign a priority to each low-level exception under [Cross-Application Components > Demand Data Foundation > Basic Settings > Exception Management > Maintain Configuration Data for Low Level Exceptions](#).

Customer-Specific Replacement Messages

You can define your own message texts under [Cross-Application Components > Demand Data Foundation > Basic Settings > Exception Management > Define Customer-Specific Replacement Messages](#).

Customizable Message Statuses

In addition to the defaults provided (*New*, *Processed*, *Ignore*), you can define your own message statuses under [Cross-Application Components > Demand Data Foundation > Basic Settings > Exception Management > Define Customizable Message Status](#).

Monitoring Exceptions

Exceptions are system-based messages that inform about situations requiring special attention or action. You can use the *Monitor Exceptions* service to review and process the exceptions.

You can do the following:

- Get an overview of the number of exceptions
- Filter the exceptions based on a number of different criteria
- Perform additional filtering based on the business area, context type, or context instance (value)
- Display the selected exceptions in a table
- Display the detailed information on the exception
- Display all low-level exceptions assigned to a selected high-level exception

More Information

- To access this service from your SAP Easy Access screen, execute transaction **nwbc** and choose [Services > Monitor Exceptions](#).
- For more information about how to use this service, see <http://help.sap.com/viewer/p/CARAB> [> <your release>](#) [Application Help > SAP Customer Activity Repository > Demand Data Foundation > General Services > Exception Management > Monitor Exceptions](#).

Purging Obsolete Exceptions

Depending on your scenario, you might have large numbers of exceptions occurring during system operation. We recommend that you regularly purge (delete) the obsolete exceptions from the database. To do this, you can use the *Purging Exceptions from the Database* report (`/DMF/PURGE_EWB_MESSAGES`).

For more information, see SAP Help Portal at <http://help.sap.com/viewer/p/CARAB> [> <your release>](#) [Application Help > Demand Data Foundation > General Services > Exception Management > Monitor Exceptions](#).

Analyzing Application Logs

You can use application logs to record application-specific events. The logs record the execution progress of the application so that you can reconstruct it later if necessary.

The *Analyze Application Log* function allows you to filter the collected information (such as messages, exceptions, and errors) for the information that you need. The following information is available:

- Basic header information on the events that have occurred
- Event details
- Technical information
- Message short and long texts

Procedure

You use the *Analyze Application Log* function as follows:

1. Call up the function via transaction **SLG1**.
2. In the *Object* field, specify the object whose application log you want to view. For example, specify **/DMF/APPL** for the Demand Data Foundation (DDF) module in SAP Customer Activity Repository or **/DPL/DMND_PLAN** for demand planning-related log entries.
3. In the *Subobject* field, you can limit your search to specific subobjects.
4. Specify additional criteria as needed and choose *Execute*.

i Note

You can define entries for your own applications in the application log via transaction **SLG0**. Use this transaction with care, as the associated table is cross-client.

Workload Monitoring

You can use the workload monitor (transaction **ST03**) to analyze statistical data for the ABAP kernel. If you are analyzing the performance of a system, you should normally start with the workload overview. You can also display the total values for all instances, and compare the performance of particular instances over a period of time. A wide range of analysis views and data helps you to find the source of performance problems quickly and easily.

Managing Inbound Processing for Demand Data Foundation

Inbound processing comprises the import of master data and transactional data into the Demand Data Foundation (DDF) module in SAP Customer Activity Repository. By default, inbound processing takes place as follows:

1. You send the data from the external system to DDF using a Remote Function Call (RFC) or enterprise services, for example. You can do either an initial load and or a delta load, which transfers only the changed object instances.
2. The import data is stored in the staging tables in DDF. Note that no business validations are performed at this step.

3. The data is transferred from the staging tables to the production tables. Business validations are performed. Once the data is available in the production tables, it can be used for follow-on processes (such as demand modeling and forecasting with the Unified Demand Forecast module).

Different services help you manage the inbound processing:

- The *Monitor Imports* service (see <http://help.sap.com/viewer/p/CARAB> > <your release> > *Application Help* > *SAP Customer Activity Repository* > *Demand Data Foundation* > *General Services* > *Monitor Imports* >)
- The *Process Inbound Staging Tables* service (/DMF/PROCESS_STAGING_TABLES report, see <http://help.sap.com/viewer/p/CARAB> > <your release> > *Application Help* > *SAP Customer Activity Repository* > *Demand Data Foundation* > *General Services* > *Monitor Imports* > *Process Inbound Staging Tables* >)

Additional Options

You can use the following options to adapt the inbound processing to your needs:

- You can choose to skip Step 1 above and bypass the staging tables. The imported data is then saved directly in the production tables. For more information, see Customizing (transaction **SPRO**) under > *Cross-Application Components* > *Demand Data Foundation* > *Basic Settings* > *Integration* > *Define Import Settings* > . Here you can define for each type of master data and transactional data whether you want to bypass the staging tables or not (default setting).
- If the processing of transportation lane, product location, or sales data from the staging tables to the production tables takes more time than expected, you can use the /DMF/SET_STAGING_CONFIG_TABLE report to activate an alternative packaging. For more information, see the report documentation (transaction **SE38**) and SAP Note [2019909](#).
- You can schedule the *Process Inbound Staging Tables* service as a batch job to move the data from the staging tables.
- You can move the data manually from the staging tables. The > *Monitor Imports* > *Manual Processing* > option is available for this.

More Information

<http://help.sap.com/viewer/p/CARAB> > <your release> > *Application Help* > *SAP Customer Activity Repository* > *Demand Data Foundation* > *Integration Information* > and *Inbound Processing*

5.1.6 Detailed Monitoring and Analysis Tools Specific to Omnichannel Promotion Pricing

Monitoring the Log Information of Transformations

In transaction **SLG1**, you can display the log and trace information that is created during the manual transformation of an DDF offer into an OPP promotion after the offer has been approved. Use the following settings for object and sub-object:

Object	Sub-Object	Description
/ROP/APPL	/ROP/BO	Omnichannel promotion pricing application

For more information, see the Application Help for SAP NetWeaver on SAP Help Portal at https://help.sap.com/viewer/p/SAP_NETWEAVER.<Verison 7.4> > *SAP NetWeaver Library: Function-Oriented View* > *Application Server* > *Application Server ABAP* > *Other Services* > *Services for Application Developers* > *Application Log (BV-SRV-BAL)* > *Application Log- User Guidelines (BV-SRV-BAL)* >.

Monitoring the Outbound Processing of Regular Prices and OPP Promotions

The outbound processing of regular prices and OPP promotions can be monitored with the following two transactions:

Transaction Code	Transaction Title	Description
DRFLOG	Analyze Log for Outbound Implementations	<p>Use this transaction to analyze the Data Replication Framework (DRF) outbound processing. You can choose the following filter criteria:</p> <ul style="list-style-type: none">• The replication model that you have created for the replication of regular prices and OPP promotions. For more information, see the application help for omnichannel promotion pricing on SAP Help Portal at https://help.sap.com/viewer/p/CARAB under >> <Version> > Application Help > SAP Customer Activity Repository > Omnichannel Promotion Pricing > Outbound Processing of Regular Prices and OPP Promotions >.• CROP_PRICE as the outbound implementation to monitor the outbound processing of regular prices.• ROP_PROMO as the outbound implementation to monitor the promotion-centric outbound processing of OPP promotions.• ROP_PRO_ST as the outbound implementation to monitor the location-specific outbound processing of OPP promotions.
WE05	IDoc List	<p>Use this transaction, if the content of the sent IDocs is of primary interest. You can choose the filter settings according to your Application Link Enabling (ALE) Customizing.</p> <p>The replication model that you have created for the replication of regular prices and OPP promotions. For more information, see the application help for omnichannel promotion pricing on SAP Help Portal at https://help.sap.com/viewer/p/CARAB under >> <Version> > Application Help > SAP Customer Activity Repository > Omnichannel Promotion Pricing > Outbound Processing of Regular Prices and OPP Promotions >.</p>

Monitoring XSA Log Information of the Promotion Pricing Service

The promotion pricing service underlies the log and trace standards of the XSA platform. In the first step, there is no configuration necessary. The standard logging level is `ERROR`.

For more information about the XSA log and trace standards, see the *SAP HANA Developer Guide For SAP HANA XS Advanced Model* on SAP Help Portal at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM ► <Version> ► Development ► SAP HANA Developer Guide ►.

The following table shows the essential XS commands that you need to handle and display logs of the web application:

Command	Description
<p>☰, Source Code</p> <pre>xs set-logging-level ppservice- webapp-central com.sap.pengine DEBUG</pre>	Use this command to raise the log level for the components of the promotion pricing service to <code>DEBUG</code> .
<p>☰, Source Code</p> <pre>xs list-logging-levels ppservice- webapp-central</pre>	Use this command to see the logging level information.
<p>☰, Source Code</p> <pre>xs logs ppservice-webapp-central</pre>	Use this command to attach to the log via tail.
<p>☰, Source Code</p> <pre>xs logs ppservice-webapp-central -- all</pre>	Use this command to dump the complete log.
<p>☰, Source Code</p> <pre>xs logs ppservice-webapp-central -- recent</pre>	Use this command to dump the recent log entries.

The same commands can be used for the `ppservice-aprouter` application.

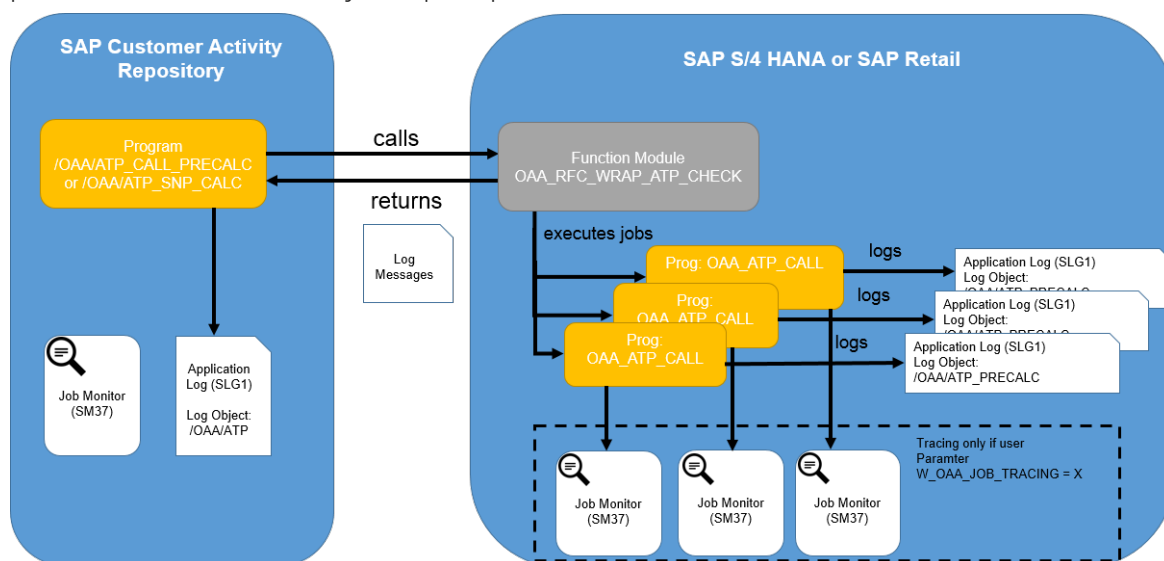
For more information, see *SAP HANA Developer Guide For SAP HANA XS Advanced Model* on SAP Help Portal at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM ► <Version> ► Development ► SAP HANA Developer Guide ►, sections:

- [The XS Command- Line Interface Reference](#)
- [Working with the XS Advanced Command- Line Client](#)

5.1.7 Detailed Monitoring and Analysis Tools Specific to Omnichannel Article Availability and Sourcing

SAP Customer Activity Repository and SAP S/4HANA or SAP Retail

- The parallelized ATP run (report `/OAA/ATP_CALL_PRECALC` or `/OAA/ATP_SNP_CALC` respectively) that is triggered in SAP Customer Activity Repository and executed in SAP S/4HANA or SAP Retail follows standard ABAP job monitoring (transaction **SM37**) and uses the standard application log (transaction **SLG1**)
 - Application log object in SAP Customer Activity Repository: `/OAA/ATP`, no subobjects
 - Application log object in SAP S/4HANA or SAP Retail: `/OAA/ATP_PRECALC`, no subobjects
- To activate the traceability of the parallelized ATP run, you need to activate user parameter `W_OAA_JOB_TRACING` (transaction **SU3**) in SAP S/4HANA or SAP Retail for the technical user entered in the RFC destination in SAP Customer Activity Repository for the SAP S/4HANA or SAP Retail destination. This allows you to trace the result of the parallelized ATP run during the implementation phase in the job monitor log of SAP S/4HANA or SAP Retail (transaction **SM37**). In the productive system, activate this user parameter in case of errors only, to improve performance.



- Sales channel mode only: **Parallel execution of sourcing strategies** uses the standard application log (transaction **SLG1**) in SAP Customer Activity Repository. It can be monitored via application log object `/OAA/SRC` (no subobjects). A warning is issued when the number of available work processes is not sufficient for the parallel execution of sourcing strategies.
- Sales channel mode only: **Upgrade of data structures for sources** (report `/OAA/SOURCE_UPGRADE`) uses the standard application log (transaction **SLG1**) in SAP Customer Activity Repository. It can be monitored via application log object `/OAA/SRC_PROP` (no subobjects).
- Sales channel mode only: **Tracing during sourcing** uses the standard application log (transaction **SLG1**) in SAP Customer Activity Repository. It can be monitored via application log object `/OAA/SRC_TRC` (no subobjects).
- With all reports in SAP Customer Activity Repository and SAP S/4HANA or SAP Retail, errors are logged with the reports.
- There is no application monitoring.

- With REST services in SAP Customer Activity Repository, there is no logging; errors are returned to the caller (that is, the online store software application). There is no application monitoring for the REST services.

SAP Commerce

OAA functionality in SAP Commerce uses standard monitoring and logging for both applications and Data Hub. For more information about the SAP Commerce Administration Console, see [Hybris Administration Console](#). The logger package is `com.sap.retail.oaa.commerce.services`.

5.2 Management

SAP provides you with an infrastructure to help your technical support consultants and system administrators effectively manage all SAP components and complete all tasks related to technical administration and operation.

You can find more information about the underlying technology in the Technical Operations Manual in the *SAP Library* under *SAP NetWeaver*.

5.2.1 Starting and Stopping

Start and Stop Sequences and Tools

Software Component	Sequence	Tool	Detailed Description
SAP HANA Database	1	sapstartsrv	See the information about starting and stopping SAP HANA systems in the <i>SAP HANA Administration Guide</i> .
RTL CAR 300	2	STARTSAP	Log on to the host of your central system as the SAP Administrator. Enter startsap ALL to start the SAP NetWeaver database, ABAP instances, and all other processes.

Software Component	Sequence	Tool	Detailed Description
SAP LT Replication Server (Optional)	3	SAP HANA Studio	<p>Use SAP HANA Studio to start replication of tables required by SAP Customer Activity Repository.</p> <p>See http://help.sap.com/viewer/p/CARAB > <your release> > <i>Installation and Upgrade Information</i> > <i>Installation Guide</i> for information on deployment options, which determine whether replication is necessary. If replication is required, this guide also provides information on how to set up table replication and which tables need to be replicated.</p> <p>For more information, see SAP Help Portal at http://help.sap.com/hana > > <i>SAP HANA Options</i> > <i>SAP HANA Real-Time Replication</i> > <i>SAP HANA Trigger-Based Data Replication Using SAP LT Replication Server</i> > <i>System Administration and Maintenance Information</i></p>
SAP LT Replication Service (Optional)	4	SAP HANA Studio	<p>Use SAP HANA Studio to stop replication of tables required by SAP Customer Activity Repository.</p> <p>For more information, see SAP Help Portal at http://help.sap.com/hana > > <i>SAP HANA Options</i> > <i>SAP HANA Real-Time Replication</i> > <i>SAP HANA Trigger-Based Data Replication Using SAP LT Replication Server</i> > <i>System Administration and Maintenance Information</i></p>

Software Component	Sequence	Tool	Detailed Description
RTL CAR 300	5	STOPSAP	Log onto the host of your central system as the SAP Administrator. Enter stopsap R3 . Note that the R3 switch does not stop the database simultaneously. To do so, use the command stopsap or stopsap ALL .
SAP HANA Database	6	sapstartsrv	See the information about starting and stopping SAP HANA systems in the SAP HANA Administration Guide.

5.2.2 Software Configuration

This chapter explains which components or scenarios used by this application are configurable and which tools are available for adjusting.

Software Component	Configuration Tool(s)	Detailed Description
RTL CAR 300	SAP Customizing (transaction SPRO)	See ▶ Customizing for SAP Customer Activity Repository ▶ .
RTLDDF 300		See ▶ Customizing for Cross-Application Components ▶ Demand Data Foundation ▶ .

5.2.3 Administration Tools

SAP Customer Activity Repository uses the standard SAP NetWeaver administration tools. For more information, see SAP Help Portal for SAP NetWeaver at <http://help.sap.com/nw> [▶ <your release> ▶ System Administration and Maintenance Information ▶ Technical Operations for SAP NetWeaver ▶ Administration of SAP NetWeaver systems and components ▶](#).

SAP Customer Activity Repository also uses the administration tools available with SAP HANA. For more information, see SAP Help Portal for SAP HANA Appliance software at http://help.sap.com/hana_appliance [▶ System Administration ▶ SAP HANA Technical Operations Manual ▶](#).

Periodic Scheduled Tasks

You can automate scheduled tasks using a task scheduler program.

Data Import

- To import master data and transactional data into the Demand Data Foundation (DDF) module, you can schedule automated import tasks using the `/DMF/PROCESS_STAGING_TABLES` report (transaction **SE38**). For more information, see <https://help.sap.com/viewer/p/CARAB> **<Version>** **>** *Application Help* **>** *SAP Customer Activity Repository* **>** *Demand Data Foundation* **>** *General Services* **>** *Monitor Imports* **>** *Process Inbound Staging Tables* **>**.
- Make sure that the master data is continuously imported into DDF. If you use an SAP ERP application as your master data system, configure the DRF data replication framework (transaction **DRFOUT**) to periodically send the data. For more information see [Configure Data Replication from SAP ERP to DDF \[page 160\]](#).

Data Export

- To periodically export regular prices and OPP promotions (outbound) as part of the Omnichannel Promotion Pricing module, you can schedule automated exports using transaction **DRFOUT**.

Periodic Tasks

A manual task needs a person to execute it. Manual tasks may be required for individual components and are therefore relevant in each scenario that uses the component. Other manual tasks may be relevant for certain scenarios only. You can schedule periodic tasks in transaction **SM36** by defining jobs for background processing.

It is important that you monitor the successful execution of these tasks on a regular basis.

→ Recommendation

You can use transaction **SE38** to run programs/reports and display the accompanying documentation.

Manual Tasks for Managing DDF

Task	Tool Supporting the Task	Recommended Frequency	Description
Purge master data	Report <code>/DMF/PURGE_AGENT</code>	As required	You can use this report to purge master data. For more information, see the report documentation.

Task	Tool Supporting the Task	Recommended Frequency	Description
Delete obsolete time series data	Report /DMF/TS_DELETE	As required	<p>You can select the data to be deleted by product and by location using key figure parameters (KPRM). You can delete data for the following time series types:</p> <ul style="list-style-type: none"> • Universal (UN) • Location Universal (UL) • Point of Sale (POS) <p>For more information, see the report documentation.</p>
Delete obsolete exception message data	Report /DMF/ PURGE_EWB_MESSAGES	As required	<p>You do not need to specify parameters for this report. You can either execute it directly or schedule it for execution. Which data is purged depends on how you have configured the exceptions in Customizing and on which deletions are performed on the user interface.</p>

Manual Tasks for Omnichannel Article Availability and Sourcing

i Note

You can access all OAA reports (with the exception of the last two) from the SAP menu, under ► [SAP Customer Activity Repository](#) ► [Omnichannel Article Availability and Sourcing](#) ►, by following the path indicated below, in the *Tool Supporting the Task* column.

Task	Tool Supporting the Task	Recommended Frequency	Description
Delete outdated ATP snapshot entries	Report /OAA/ ATP_SNAPSHOT_DELETION in SAP Customer Activity Repository SAP Menu: ► ... ► General ► Delete Entries in ATP Snapshot ►	As required	If articles are removed from the assortment of an online store, availability information for these articles persists in the ATP snapshot. The report removes these entries.

Task	Tool Supporting the Task	Recommended Frequency	Description
Delete temporary reservations that have built up over time	Report /OAA/ ATP_RESV_DELETION in SAP Customer Activity Repository SAP Menu: ► ... ► <i>General</i> ► <i>Delete Temporary Reservations</i> ►	As required	<p>As a default, outdated temporary reservations for order items are deleted automatically on a regular basis through report /OAA/ ATP_OUTDATED_RESV_CLEANUP. However, in some cases, for example, if there are existing cart reservations or if articles have been removed from the assortment of an online store, temporary reservations are left in the database and need to be removed via this report.</p> <p>There are two types of reservation: cart reservations and order reservations. You can delete all reservations or delete cart reservations only.</p> <p>While it is possible to select both deletion options, best practice in business would be to create and schedule two independent variants, namely one per option. The variant for the <i>Delete all reservations</i> option could be scheduled to run every week, while the variant for the <i>Delete cart reservations only</i> option could be scheduled to run every 30 minutes, for example.</p>
Clean up ATP delta tables	Report /OAA/ ATP_DELTA_CLEANER in SAP Customer Activity Repository SAP Menu: ► ... ► <i>General</i> ► <i>Clean Up ATP Delta Tables</i> ►	As required	<p>The report is used to clean up two tables in SAP S/4HANA or SAP Retail that log stock-relevant changes to article/source combinations. Both tables contain more entries than needed, that is, they contain a number of entries that are not relevant for your online stores. These entries keep building up over time and should be deleted.</p>

i Note

As of SAP S/4HANA 1909 as back end, this report was replaced with the new report OAA_CLEAN_DELTA_TABLE available in SAP S/4HANA.

Task	Tool Supporting the Task	Recommended Frequency	Description
Delete outdated sourcing traces	Report /OAA/ SRC_TRACE_DELETION in SAP Customer Activity Repository SAP Menu: ► ... ► <i>Sales Channel Mode</i> ► <i>Delete Sourcing Traces</i> ►	As required	The report is used to clear the database of outdated sourcing traces.
Delete OAA data related to invalid sources	Report /OAA/SOURCE_DELETION in SAP Customer Activity Repository	As required	If sources are deleted or archived in SAP S/4HANA or SAP Retail, sources used in OAA automatically become invalid and are excluded from sourcing. However, OAA data related to those sources persists in a number of OAA tables. You use this report to clean up the respective OAA tables.
<div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 10px;"> <p>i Note</p> <p>The report is embedded in the standard data destruction functionality of SAP Information Lifecycle Management (ILM). To execute it, call up transaction ILM_DESTRUCTION and enter OAA_SOURCE as ILM object. This ILM object is mapped to data destruction object OAA_SOURCE_DATA_DESTRUCTION.</p> <p>For more information about SAP ILM, see https://help.sap.com/viewer/p/SAP_INFORMATION_LIFECYCLE_MANAGEMENT.</p> </div>			
Delete outdated entries in uploaded vendor stock information	Report OAA_VEND_STOCK_DELETION in SAP S/4HANA or SAP Retail	As required	If article/vendor combinations are no longer valid for the assortment of an online store, availability information for these articles persists in the uploaded vendor stock information in SAP S/4HANA or SAP Retail. You use this report to remove these entries from the uploaded vendor stock information.

i Note

For more information about any of the OAA reports, see the detailed report documentation in the system.

Manual Tasks for Omnichannel Promotion Pricing

Task	Tool Supporting the Task	Recommended Frequency	Description
Purge OPP promotion data	Report /DMF/PURGE_AGENT	As required	This report purges OPP promotion data as part of the purging of DDF offers. For more information, see the system documentation of the report.
Archive IDocs for OPP promotion outbound processing and regular price outbound processing	<p>► SAP Menu ►</p> <p>Administration ► System Administration ►</p> <p>Administration ►</p> <p>Administration ► and choose Data Archiving (transaction code SARA).</p>	As required	For more information about archiving IDocs, see the documentation on SAP Help Portal at http://help.sap.com/saphelp_nw70/helpdata/en/dc/6b821443d711d1893e0000e8323c4f/content.htm under <i>Archiving and Deleting IDocs</i> .

Periodic Tasks for Demand Planning

Program Name/Task	Tool Supporting the Task	Recommended Frequency	Description
/DPL/REORG_FCC_TABLES Reorganization of Forecast Corrections	Transaction SM36 for scheduling a background job or run manually in transaction /DPL/FCC_REORG	Depending on your business requirements As required	This report deletes forecast corrections.
/DPL/ REORG_DRAFT_TABLES Forecast Correction: Reorganization of Draft Tables	Transaction SM36 for scheduling a background job or run manually in transaction /DPL/ FCC_DRAFT_REORG	Daily	This report deletes expired forecast correction drafts. For more information, see Draft Handling for Demand Planning SAP Fiori Apps [page 287] .
/DPL/REORG_DIF_TABLES Reorganization of DIF Assignment Tables (*MAIN/*OCC/*PRD/*LOC)	Transaction SM36 for scheduling a background job or run manually in transaction /DPL/DIF_REORG	Depending on your business requirements As required	This report deletes DIF assignments.

Program Name/Task	Tool Supporting the Task	Recommended Frequency	Description
/DPL/ REORG_DIF_DRAFT_TABS	Transaction SM36 for scheduling a background job or run manually in transaction /DPL/ DIF_DRAFT_REORG	Daily	This report deletes DIF assignment drafts.
DIF Assignments: Reorganization of Draft Tables			This report deletes expired forecast correction drafts. For more information, see Draft Handling for Demand Planning SAP Fiori Apps [page 287].

5.2.4 Draft Handling for Demand Planning SAP Fiori Apps

Draft Concept for *Adjust Forecast* and *Manage Demand Influencing Factors* Apps

A draft is an interim version of a business entity that has not yet been explicitly saved as an active version. Drafts support a stateless communication. Drafts of forecast corrections and demand influencing factor (DIF) assignments are saved automatically in the background whenever users add or change forecast corrections or DIF assignments. The draft is then available as the personal working version for this user.

The creation of drafts by an *autosave* function:

- Keeps unsaved changes if editing is interrupted, even when the data for a forecast correction or a DIF assignment is not complete. Users can resume editing of the forecast correction or DIF assignment draft later.
- Prevents data loss if the app terminates unexpectedly.
- Prevents multiple users from editing the same object concurrently (locking mechanism).
- Makes one user aware of parallel unsaved changes by another user.

When a user starts creating a forecast correction or DIF assignment or starts editing an existing one, a draft is created in parallel in the background. The draft enables field validation and dynamic field control and provides default values for fields based on recent data entries. While the user is modifying a business entity, a saving indicator shows when a draft is saved implicitly. This implicit saving does not replace the saving by the user. Choosing [Save](#) is still necessary to incorporate the implicitly saved changes into an active business document.

Life-Cycle Management of Drafts










The life-cycle of drafts is managed by CDS annotations. Forecast correction and DIF assignment drafts have the following settings:

- Time frame after which a draft can be deleted.
- Time frame after which the draft assignment to a user expires.
- Time frame for which a draft is locked (enqueue).

→ Tip

Drafts must be deleted at regular intervals. We recommend scheduling periodic tasks for reports /DPL/REORG_DRAFT_TABLES and /DPL/REORG_DIF_DRAFT_TABS to delete forecast correction and DIF assignment drafts.

More Information

Subject	Path
Draft concept for SAP Fiori	See the <i>SAP - ABAP Programming Model for SAP Fiori</i> at http://help.sap.com/nw  SAP NetWeaver Application Server for ABAP. Select your release. Search for <i>ABAP Programming Model for SAP Fiori</i> . Choose  Concepts  Draft Concepts  .
ObjectModel Annotations	See the <i>SAP - ABAP Programming Model for SAP Fiori</i> at http://help.sap.com/nw  SAP NetWeaver Application Server for ABAP. Select your release. Search for <i>ABAP Programming Model for SAP Fiori</i> . Choose  Reference  CDS Annotations  ObjectModel Annotations  .

Related Information

[Administration Tools \[page 281\]](#)

5.2.5 Backup and Restore

Use

You need to back up your system landscape regularly to ensure that you can restore and recover it in case of failure. The backup and restore strategy of your system landscape must not only include your strategy for your SAP system, but it must also be included in your company's overall business requirements and incorporated into your entire process flow.

In addition, the backup and restore strategy must cover disaster recovery processes, such as how to recover from the loss of a data center due to a fire. It is important that your strategy specify that normal data and backup data are stored in separate physical locations, so that both types of data are not lost in case of a disaster.

SAP Customer Activity Repository is based on SAP NetWeaver technology; therefore, the SAP NetWeaver backup procedures can also be used for SAP Customer Activity Repository.

More Information

Subject	Path
Backup and recovery processes for ABAP, JAVA, Business Intelligence, or Process Integration	See the Technical Operations Manual for SAP NetWeaver at http://help.sap.com/nw . Choose a release. Choose ► System Administration and Maintenance Information ► Technical Operations Guide ► Technical Operations Manual for SAP NetWeaver ► .
Backup and restore for SAP systems	See SAP Support Portal at http://support.sap.com/support-programs-services/methodologies.html ► Best Practice ► System/Technical Administration: Backup and Restore for SAP Systems Landscapes ► .
Backing up and recovering the SAP HANA database	See SAP Help Portal for SAP HANA Platform at http://help.sap.com/hana_appliance . Choose a release. Choose ► System Administration ► SAP HANA Administration Guide ► .

5.2.6 Load Balancing

For information about load balancing, see the following references:

Topic	Path
Standard functionality of SAP NetWeaver for logon and load balancing	See SAP Help Portal for SAP NetWeaver at http://help.sap.com/nw . Choose a release. Under <i>System Administration and Maintenance Information</i> , choose ► Technical Operations Manual for SAP NetWeaver ► Solution Lifecycle Management ► High Availability ► SAP NetWeaver AS ABAP: High Availability ► Unplanned Downtime for SAP NetWeaver AS ABAP ► Service Configuration for Failure Resilience ► Message Server-Based Logon and Load Balancing (Redirection) ► .

Topic	Path
Partitioning and scale-out for SAP HANA	See SAP Help Portal for SAP HANA Appliance software at http://help.sap.com/hana_appliance . Choose a release. Under <i>System Administration and Maintenance Information</i> , choose SAP HANA Administration Guides SAP HANA Administration Guide Scaling for SAP HANA .
Partitioning of the /POSDW/TLOGF table	SAP Note 1719282 .
Classify TLOG Tables for SAP Customer Activity Repository Report	See the report documentation (transaction /POSDW/CLASSIFY_TLOG in your SAP Customer Activity Repository System) and SAP Note 1980718 .
Optionally, backup and restore for the SAP Landscape Transformation (LT) Replication Server (if you wish to start additional processes in SLT)	See SAP Help Portal for SAP HANA Appliance software at http://help.sap.com/hana_appliance . Choose a release. Under <i>System Administration and Maintenance Information</i> , choose SAP HANA Technical Operations Manual Administering and Operating SAP HANA Replication Technologies Backup and Recovery of SAP HANA Replication Technologies .
<div style="background-color: #e0e0e0; padding: 5px;"> <p>i Note</p> <p>See http://help.sap.com/viewer/p/CARAB <your release> Installation and Upgrade Information Installation Guide for information on deployment options, which determine whether replication is necessary.</p> </div>	
Partitioning for UDF and DDF	See the <i>Partition Tables for UDF and DDF (Optional)</i> section in the <i>Common Installation Guide</i> , available at http://help.sap.com/viewer/p/CARAB <your release> Installation and Upgrade Information Installation Guide .
Configure Load Balancing service in DDF	See http://help.sap.com/viewer/p/CARAB <your release> Application Help SAP Customer Activity Repository Demand Data Foundation General Services Configure Load Balancing (including special considerations for demand modeling and forecasting with UDF).

5.3 High Availability

Use

SAP Customer Activity Repository is based on SAP HANA and SAP NetWeaver technology; all high availability considerations that apply to SAP HANA and SAP NetWeaver, such as increasing system availability, improving performance, and eliminating unplanned downtime, also apply to SAP Customer Activity Repository.

More Information

Topic	Path
General information on high-availability strategies for SAP NetWeaver-based systems	See SAP Help Portal for SAP NetWeaver at http://help.sap.com/nw . Choose a release. Under <i>Application Help</i> , choose ► <i>Function-Oriented View</i> ► <i>Solution Life Cycle Management</i> ► <i>SAP High Availability</i> .
General information on high availability strategies for SAP HANA based systems	See SAP Help Portal for SAP HANA Appliance software at http://help.sap.com/hana_appliance . Choose a release. Under <i>System Administration and Maintenance Information</i> , choose ► <i>SAP HANA Technical Operations Manual</i> ► <i>Administering and Operating SAP HANA</i> ► <i>High Availability</i> .

5.4 Software Change Management

Software Change Management standardizes and automates software distribution, maintenance, and testing procedures for complex software landscapes and multiple software development platforms. These functions support your project teams, development teams, and application support teams.

Use

The goal of Software Change Management is to establish consistent, solution-wide change management that allows for specific maintenance procedures, global roll-outs (including localizations), and open integration with third-party products.

This section provides additional information about the most important software components.


Change and Transport Management

For transport and change management issues, the procedures of SAP NetWeaver apply. For more information, see the *Change and Transport System* section for your SAP NetWeaver Platform under https://help.sap.com/viewer/p/SAP_NETWEAVER ► *<your SAP NetWeaver Platform>* ► *Operations* ► *Technical Operations for SAP NetWeaver* ► *Administration of Application Server ABAP*.

Development Requests and Development Release Management

You use the standard tools and procedures of SAP NetWeaver to transport SAP Customer Activity Repository code extensions or Customizing changes. All such changes are captured by the transport system and are transportable.

More Information

Information about...	Path
Change Management for SAP HANA-based systems	https://help.sap.com/viewer/p/SAP_HANA_PLATFORM ▶ <Version> ▶ <i>Installation and Upgrade</i> ▶ <i>SAP HANA Master Guide</i> ▶ <i>SAP HANA Implementation and Operation</i> ▶ <i>Operating SAP HANA</i> ▶ <i>SAP HANA Appliance</i> ▶ <i>Change Management</i> ▶
Additional information on manual correction process for ABAP on SAP HANA	SAP Note 1798895  .

Implementation of Support Packages and Patches

Support package stacks are sets of support packages and patches for the respective product version that must be used in the given combination. The technology for applying support packages and patches will not change.

→ Tip


We highly recommend that you always implement *support package stacks* of SAP NetWeaver, SAP HANA Platform, and SAP Customer Activity Repository applications bundle.

Before applying any support packages or patches of the selected support package stack, consult the following guides for SAP Customer Activity Repository applications bundle under <https://help.sap.com/viewer/p/CARAB> ▶ <Version> ▶ *Installation and Upgrade* ▶:

- For new installations: *Common Installation Guide*
- For upgrade scenarios: *Common Upgrade Guide*

More Information

For more information about software change management, see the following:

Information about...	Path
Maintenance Planner	https://support.sap.com  ▶ <i>SAP Solution Manager</i> ▶ <i>SAP Solution Manager 7.2</i> ▶ <i>Processes for 7.2</i> ▶ <i>Processes</i> ▶ <i>Landscape Management</i> ▶ <i>Maintenance Planner</i> ▶

Information about...

Path

Support Package Stacks

<https://support.sap.com> ▶▶ My Support ▶ Software
Downloads ▶ Support Package Stacks ▶

5.5 Troubleshooting for SAP Customer Activity Repository Modules

Diagnose and resolve issues that may arise during the day-to-day running of your solution. Troubleshooting tips are provided for different modules in SAP Customer Activity Repository.

→ Tip

For quick access to support information, log in to the SAP ONE Support Launchpad at <https://launchpad.support.sap.com/#/productsearch> and search for SAP CARAB (back-end) or SAP FIORI FOR SAP CARAB (front-end). Find SAP Knowledge Base Articles, Documentation, Guided Answers, Questions & Blogs, and Download information — all on one page.

If you need to report a customer incident, see the [Support Desk Management \[page 305\]](#) section for more information.

5.5.1 Troubleshooting for Omnichannel Article Availability and Sourcing (OAA)

Symptom	Cause	Solution
OAA is not working at all or not working as expected.	Something is wrong with the technical configuration or the business configuration of OAA.	<p>Run report <code>/OAA/CHECK_SYSTEM_SETUP</code> (<i>Check of System Setup and Configuration for OAA</i>).</p> <p>This report can help you check whether your system landscape is ready to run OAA, or find out why specific errors occur.</p> <p>It can check the technical setup as well as the business configuration of OAA. The result of the checks is displayed in a list that shows either the detailed output log, or only the error log with further information on how to solve the detected errors.</p>
In SAP Commerce, there is no availability information in the cart.	Availability data could not be retrieved from SAP Customer Activity Repository.	Check whether the SAP Customer Activity Repository system is up and running.

Symptom	Cause	Solution
		<p>If the SAP Customer Activity Repository system is up and running:</p> <p>In SAP Commerce, check the log files. Requests and responses for the 3 OAA REST services are logged in the standard application log files of SAP Commerce. For error analysis, set the log4j log level for logger package <code>com.sap.retail.oaa.commerce.services</code> to <i>DEBUG</i> in the SAP Commerce administration console, under ▶ Platform > Logging ▶. Repeat process and check log files again.</p>

Symptom	Cause	Solution																																		
		<p>If there are errors in the log files: In SAP Commerce, check whether Backoffice Customizing is correct.</p> <p>If there are no errors in the log files: Check whether the OAA tables have been replicated from SAP S/4 HANA or SAP Retail to SAP Customer Activity Repository.</p> <p>For OAA, the following tables must be replicated via SLT:</p> <ul style="list-style-type: none"> • Tables used directly by OAA: 																																		
		<table border="1"> <thead> <tr> <th>Table</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>MARA</td> <td>Article master data</td> </tr> <tr> <td>MAKT</td> <td>Article names</td> </tr> <tr> <td>MARM</td> <td>Article-related units of measure</td> </tr> <tr> <td>LFA1</td> <td>Vendor master data</td> </tr> <tr> <td>EINA</td> <td>Purchasing info records</td> </tr> <tr> <td>T001W</td> <td>Site master data</td> </tr> <tr> <td>VBAK</td> <td>Sales documents</td> </tr> <tr> <td>TTZCU*</td> <td>Time zones</td> </tr> <tr> <td>OAA_ATP_PROFI LE*</td> <td>ATP parallelization profiles</td> </tr> <tr> <td>VBAP</td> <td>Details of sales document items</td> </tr> <tr> <td>VBUP</td> <td>Statuses of sales document items</td> </tr> <tr> <td>GEOLOC*</td> <td>Geocoordinates of data sources</td> </tr> <tr> <td>ADRC</td> <td>Address data</td> </tr> <tr> <td>BUT000*</td> <td>General data of business partners (SAP S/4HANA only)</td> </tr> <tr> <td>BUT021_FS*</td> <td>Addresses of business partners (SAP S/4HANA only)</td> </tr> <tr> <td>CVI_CUST_LINK</td> <td>Mapping of customers and business partners</td> </tr> </tbody> </table>	Table	Description	MARA	Article master data	MAKT	Article names	MARM	Article-related units of measure	LFA1	Vendor master data	EINA	Purchasing info records	T001W	Site master data	VBAK	Sales documents	TTZCU*	Time zones	OAA_ATP_PROFI LE*	ATP parallelization profiles	VBAP	Details of sales document items	VBUP	Statuses of sales document items	GEOLOC*	Geocoordinates of data sources	ADRC	Address data	BUT000*	General data of business partners (SAP S/4HANA only)	BUT021_FS*	Addresses of business partners (SAP S/4HANA only)	CVI_CUST_LINK	Mapping of customers and business partners
Table	Description																																			
MARA	Article master data																																			
MAKT	Article names																																			
MARM	Article-related units of measure																																			
LFA1	Vendor master data																																			
EINA	Purchasing info records																																			
T001W	Site master data																																			
VBAK	Sales documents																																			
TTZCU*	Time zones																																			
OAA_ATP_PROFI LE*	ATP parallelization profiles																																			
VBAP	Details of sales document items																																			
VBUP	Statuses of sales document items																																			
GEOLOC*	Geocoordinates of data sources																																			
ADRC	Address data																																			
BUT000*	General data of business partners (SAP S/4HANA only)																																			
BUT021_FS*	Addresses of business partners (SAP S/4HANA only)																																			
CVI_CUST_LINK	Mapping of customers and business partners																																			

Symptom

Cause

Solution

Table	Description
CVI_VEND_LINK	Mapping of vendors and business partners
TVSBT*	Names of shipping conditions
MAW1*	Article master data: default fields and special retail fields
T023	Article groups (SAP S/4HANA only)
T023T	Article group names (SAP S/4HANA only)
TPMT*	General item category group (SAP S/4HANA only)
T134	Article types (SAP S/4HANA only)
T134T	Article type names (SAP S/4HANA only)
T006	Units of measure (SAP S/4HANA only)
WRF3*	Supplying sites for pickup points as sources (SAP S/4HANA 1909 only)
OAA_DC_CONTEX T*	Contexts for DC stock separation (SAP S/4HANA 1909 only)

i Note

The tables marked with an asterisk (*) are exclusively used by OAA. All other tables are part of the standard SLT replication scope for SAP Customer Activity Repository.

- Tables required for Inventory Visibility view
InventoryVisibilityWithSalesOrderReservedQuantity, such as MARD and VBFA

If SLT replication is okay: In SAP Customer Activity Repository, check the ATP snapshot (transaction **SE11**, table /OAA/ATP_SNP_HDR and /OAA/ATP_SNP_ITM, external view /OAA/ATP_AVAIL).

Symptom	Cause	Solution
		<p>If these tables and this view are empty: In SAP Customer Activity Repository, check whether the following report was scheduled (transaction SM37) and was executed successfully (transaction SLG1, object /OAA/ATP):</p> <ul style="list-style-type: none"> • Sales channel mode: /OAA/ATP_SNP_CALC • OAA profile mode: /OAA/ATP_CALL_PRECALC or report /OAA/ATP_VENDOR_CALC <hr/> <p>If the report was executed successfully: In SAP S/4 HANA or SAP Retail, check scheduled jobs (transaction SM37; see prefix for jobs set in ATP profile in Customizing activity <i>Define ATP Parallelization Profiles for DC Articles</i>).</p>
In SAP Commerce, rough stock indicators (RSI) are not updated.	RSI data has not reached the Solr index in SAP Commerce.	<p>In SAP Customer Activity Repository, check whether the RSI IDoc was sent:</p> <ul style="list-style-type: none"> • Sales channel mode: transaction SM37: job monitor of report /OAA/ATP_RSI_GENERATION_SC. • OAA profile mode: transaction SM37: job monitor of report /OAA/ATP_RSI_GENERATION. <hr/> <p>If the IDoc was not sent: Check whether errors occurred during generation of the IDoc (transactions WE05, BD87). If the IDoc was sent: In the Backoffice application of SAP Commerce, check whether the rough stock indicators exist in the virtual warehouse that is to be the receiver of this information.</p> <hr/> <p>If the rough stock indicators do not exist in the virtual warehouse, check the standard logging of the Data Hub. You can access the information contained in the Data Hub directly using the following standard browser GET requests:</p> <ul style="list-style-type: none"> • <code>http://localhost:8080/datahub-webapp/v1/pools/SAPOAARSI_INBOUND_POOL/items/RawCARRsi.xml</code> • <code>http://localhost:8080/datahub-webapp/v1/pools/SAPOAARSI_INBOUND_POOL/items/CanonicalStockLevel.xml</code> <p>If the rough stock indicators exist in the virtual warehouse, check whether the Solr index was updated correctly.</p>
In SAP Commerce, the error message <i>Failed to place the order</i> is displayed when you click <i>Place Order</i> in checkout.	Sourcing was called but might have failed.	Check the logs in SAP Commerce for error messages.

Symptom	Cause	Solution
In SAP Customer Activity Repository, there is no F4 help available for ATP parallelization profiles in Customizing activity Define OAA Profiles .	Table OAA_ATP_PROFILE has not been replicated from SAP S/4HANA or SAP Retail.	Check SLT replication (see tables mentioned above).
In SAP Customer Activity Repository, no sourcing traces exist although tracing was activated.	An error occurred.	Check the application log (transaction <code>SLG1</code> using application log object <code>/OAA/SRC_TRC</code>).
The sourcing response time increases unexpectedly.	Possibly resources are not sufficient.	Check the logs in SAP Commerce for error messages. Check the application log (transaction <code>SLG1</code> using application log object <code>/OAA/SRC</code> , in SAP Customer Activity Repository).

5.5.2 Troubleshooting for On-Shelf Availability

Viewing Back-End Error Messages

Back end error messages are saved in the SAP Gateway system. To access these error messages, perform the following steps:

1. Start transaction [/IWFND/ERROR_LOG](#).
2. Select the log entry and choose [Error Context](#).
3. Choose [Application Log](#).
4. Note down the error number of each message with the following message text:
`This is an external message. Access message text via details`
5. Choose [Detail exists](#) to view the text of each external error message.

Cleaning Up SAP Gateway Cache

You can clean up the cache on the SAP Gateway server by running transaction [/IWFND/cache_cleanup](#). Cleaning up cache on the back-end using transaction [/IWBEP/cache_cleanup](#) is also recommended.

Verifying BAdI Implementations

On-Shelf Availability requires that the BAdIs found in Customizing under [SAP Customizing Implementation Guide](#) [SAP Customer Activity Repository](#) [On-Shelf Availability](#) [Enhancements Using Business Add-Ins](#) have an implementation.

In the event that a BAdI does not have an implementation specific to your business scenario, you can expect the following system behavior:

BAdI Missing Implementation	Result
Process Shelf Status Change Notifications	No error occurs, no On-Shelf Availability alerts will be reported.
Retrieve Algorithm Detection Time	Runtime error in On-Shelf Availability when executing the OSA algorithm.
Retrieve Department Data	Runtime error in OData service.
Retrieve Sub-Department Data	Runtime error in On-Shelf Availability when executing the OSA algorithm.
Retrieve Product Data	Runtime error in OData service.
Retrieve Additional Product Information Data	No error occurs, no additional product information (such as promotion and layout) will be available.
Retrieve Listed Product Data	Runtime error in On-Shelf Availability when executing the OSA algorithm.
Retrieve Product Inventory Data	No error occurs, product inventory information will not be available.
Retrieve Image URL Data	No error occurs, product images will not be available.
Retrieve Store and Factory Calendar Data	Runtime error in OData service.

Troubleshooting Results of the On-Shelf Availability Algorithm

The following Customizing settings under [SAP Customizing Implementation Guide](#) [SAP Customer Activity Repository](#) [On-Shelf Availability](#) [Initialize On-Shelf Availability Algorithm](#) can have the most impact on the results of the OSA algorithm:

- **Level Of Granularity**
This setting impacts on which level the intra-week pattern analyzer step of the OSA algorithm will be executed: on product, sub-department or store level. For example, when the *Level of Granularity* is set to 2000, you need transactional information containing 2000 x 2.5 times the number of instances at which the product was sold during the period specified in the *Number of Weeks* setting.

To run the intra-week pattern analyzer step at the product level, the product must have been sold 5000 times at the store considered by the algorithm. To run the intra-week pattern analyzer step at the sub-department level, products of that sub-department must have been sold 5000 times at the store considered by the algorithm.

To run the intra-week pattern analyzer step at the store level, 5000 products must have been sold by the store in the specified *Number of Weeks* setting.

- ***Minimum Transaction Threshold***

This setting determines which products will be considered when the estimation model step of the OSA algorithm is executed: products included in fewer transactions than specified in the *Minimum Transaction Threshold* setting during the period specified in the *Number of Weeks* setting will be excluded.

For example, if the *Minimum Transaction Threshold* setting is 50 and the *Number of Weeks* is set to 13, then a product will be excluded by the estimation model if it is sold in fewer than 50 transactions during a 13-week period.




5.5.3 Troubleshooting for Modeling and Forecasting

You may encounter issues while using the Unified Demand Forecast (UDF) module and the demand planning SAP Fiori apps (*Analyze Forecast*, *Adjust Forecast*, *Manage Demand Influencing Factors*). Find information here that helps you to diagnose data issues, fix errors, or investigate unexpected forecast results.

i Note

Additional troubleshooting information is available for installation, upgrade, and setup issues. See the *Troubleshooting* section of the *Common Installation Guide* (for new installations) or the *Common Upgrade Guide* (for upgrade scenarios). You can find both guides on SAP Help Portal under <https://help.sap.com/viewer/p/CARAB> ► *<Version>* ► *Installation and Upgrade* ►.

How to Troubleshoot Specific Modeling and Forecasting Issues

Area	Symptom	Cause	Possible Solutions
Modeling and forecasting	You get the error 905 Structured Query Language (SQL) exception detected: &1&2&3&4 .	An SQL error must be fixed.	Use the system log (transaction SM21) to find the underlying SQL exception: <ul style="list-style-type: none"> To help find the correct log entries, specify the user and the approximate time frame. Look for entries with the same error as in this message. Note that the log may span several lines. This is indicated by a red priority icon and an initial ">". Attempt to determine the root cause and a corrective action based on the message texts of the applicable log entries.
Modeling and forecasting	You get the errors 901 Failed execution for &1 and 926 Failed decomposition .	Possibly a data issue; no active product locations.	See the message long texts (transaction SE91).
Modeling and forecasting	You get the errors 901 Failed execution for &1 and 905 Structured Query Language (SQL) exception: &1&2&3&4 and 926 Failed decomposition .	Most likely a SQL error must be fixed.	See the message long texts (transaction SE91).
Modeling and forecasting	You get the error Could not execute 'call_SYS_AFL...' or the error Repository: Internal error during statement execution....	The privileges for calling application function libraries (AFLs) are not assigned correctly or are incomplete.	SAP Note 1846194 
Modeling and forecasting	You are experiencing different issues with UDF processes and analytics.	You might have data records with empty time granularity fields (TIME_GRAN="") in the UDF output tables.	SAP Note 2560853  (only relevant for upgrade scenarios; not relevant for new installations of the current release)
Offers	You want to forecast complex offers (such as Buy X Get Y).	You must set up a specific task decomposition to run production forecasts with the UDF module.	SAP Note 2176058 

Area	Symptom	Cause	Possible Solutions
Offers	You are performing what-if forecasts for offers in SAP Promotion Management. You get an offer forecast that is much higher than expected and want to investigate the causes.	Different causes are possible.	<p>You can analyze the forecast as follows:</p> <ol style="list-style-type: none"> 1. Check which products are assigned to the offer in the <i>Offer Financials</i> table (/DMF/OFR_FIN_DTL). 2. Determine the time period of the offer. 3. Determine the tactics of the offer. 4. Identify the critical products. This means, the products with the largest difference between the actual offer sales in the past and the forecasted offer sales in the future. 5. Open the <i>Schedule Model and Forecast</i> service. 6. Specify a <i>Diagnostic ID</i> and run a diagnostic forecast for the critical products. 7. Visualize the results in the <i>Analyze Forecast</i> SAP Fiori app. Check whether you can see what caused the critical forecasts. 8. Check the parameter estimates that were generated during modeling in the /DMF/UMD_PAR table. 9. Repeat as often as necessary to analyze different scenarios: <ol style="list-style-type: none"> 1. Run another diagnostic forecast, this time with a different configuration and under a new <i>Diagnostic ID</i>. 2. Again, check the results in the <i>Analyze Forecast</i> app and see whether you can explain the critical forecasts.

Area	Symptom	Cause	Possible Solutions
Offers	Offers imported from ERP promotions are missing.	Different causes are possible.	<ul style="list-style-type: none"> See the <i>Offer Master Data</i> section under https://help.sap.com/viewer/p/CARAB > <Version> > <i>Application Help</i> > <i>SAP Customer Activity Repository</i> > <i>Demand Data Foundation</i> > <i>Integration Information</i> > <i>Inbound Processing</i> > <i>Inbound Interfaces For Remote Function Call (RFC) Communication</i> >. For information about exporting ERP promotions to offers, see SAP Note 1830164.
Offers	You get an error saying that the offer is invalid or unsupported.	<p>Different causes are possible. The following conditions apply:</p> <ul style="list-style-type: none"> There must be at least one buy term. Multiple get terms are not supported, regardless of the operator. Product quantities cannot be zero or less. AND buy terms are not supported. Multiple coupons at the offer level are not supported. Coupons are not supported at the term level at all. Duplicate product locations on the buy side are not supported. Duplicate product locations on the get side are not supported. 	<ul style="list-style-type: none"> You can identify invalid and unsupported offers as follows: Check table /DMF/UMD_TS, column /DMF/OFFER_LIFT_TYPE_CODE having a value equal to 98 (invalid) or 99 (unsupported). Change the offer so that it complies with the conditions on the left.

Area	Symptom	Cause	Possible Solutions
Performance	You are experiencing performance issues in your SAP HANA database.	You need information on how to troubleshoot and resolve those issues and how to enhance performance in general.	See the <i>SAP HANA Troubleshooting and Performance Analysis Guide</i> for your SAP HANA Platform version at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM ▶ <Version> ▶ Administration ▶
Performance	You get a runtime error or exit message and need information about possible causes and solutions.	Different causes are possible.	Use the ABAP dump analysis (transaction ST22) to search for short dumps and call up detailed error information.
Remote Function Calls (RFCs), function modules	You are experiencing workflow issues when executing an RFC function module (such as /DMF/ UFC_RETRIEVE_RESULTS_FR).	Different causes are possible.	SAP Note 1098805 (detailed troubleshooting information for different causes, tips & tricks)
SAP Fiori	You cannot open the <i>Analyze Forecast</i> app in your SAP Fiori launchpad.	The back-end reuse library might not be loading correctly.	You can do the following in the back-end system: <ol style="list-style-type: none"> 1. In transaction SICF, search for the /sap/bc/ui5_ui5/sap/ddfreuse_v2 service and check that it is active. 2. If the service is active, reset the SAP Fiori cache: In transaction SE38, execute the following reports: /UI5/ APP_INDEX_CALCULATE and /UI2/ INVALIDATE_GLOBAL_CACHES and /UI2/ INVALIDATE_CLIENT_CACHES. 3. Clear your browser cache and check whether you can now open the app.

Area	Symptom	Cause	Possible Solutions
SAP Fiori	You are using the <i>Analyze Forecast</i> and/or <i>Adjust Forecast</i> app and want to use the <i>Product Hierarchy</i> filter. However, no hierarchies are displayed.	No product hierarchies are assigned to your ABAP back-end user in the <i>Maintain Area of Responsibility</i> service in transaction <code>SWDC</code> . The app only displays product hierarchies assigned to you.	Verify the product hierarchy assignments in your area of responsibility (AOR). For more information, see the <i>Maintain Area of Responsibility</i> section under https://help.sap.com/viewer/p/CARAB >> <Version> > Application Help > SAP Customer Activity Repository > Demand Data Foundation > General Services > Maintenance Services >.
Modeling and forecasting	In the standard implementation, you cannot execute modeling and forecasting until the import of master data and transactional data ("inbound processing") has been completed. This poses certain challenges for your specific scenario.	A modification is available that allows you to execute modeling and forecasting in parallel to inbound processing.	SAP Note 2710523 >

5.6 Support Desk Management

Use

Support Desk Management enables you to set up an efficient internal support desk for your support organization that seamlessly integrates your end users, internal support employees, partners, and SAP Active Global Support specialists with an efficient problem resolution procedure.

For support desk management, you need the methodology, management procedures, and tools infrastructure to run your internal support organization efficiently.

Remote Support Setup

You can set up a read-only user for remote support purposes that provides access to the consuming applications and SAP NetWeaver transactions.

The following roles should be assigned to this user:

- `SAP_QAP_BC_SHOW` (for SAP NetWeaver)
- Role of the consuming application

If you want to use SAP remote services (for example, SAP EarlyWatch or Remote Consulting), or if you would like to permit an SAP support consultant to work directly in your system to make a more precise problem diagnosis, then you need to set up a remote service connection.

Additionally, there exists an ABAP role for read-only access for remote support that is also relevant. This role (SAP_RCA_SAT_DISP for ABAP) is available in the STPI plug-in and is generated when a managed system is connected to SAP Solution Manager.

Should any additional application-specific functionality be necessary for use by an SAP support consultant, then an applicable role should be defined providing the appropriate authorization(s) and assigned to the SAP support consultant's user login.

Reporting Customer Incidents

When you report an incident (that is, create an SAP support message) for your installation, you must specify an application component. The most relevant components for SAP Customer Activity Repository are listed as follows:

- CA-RT-CAR-PIP - to report an incident for the POS Data Transfer and Audit module (POS Data Management).
- CA-DDF-RT - to report an incident for the Demand Data Foundation (DDF) module.
- CA-DDF-RT-UDF - to report an incident for the Unified Demand Forecast (UDF) module. This includes messages relating to the *Analyze Forecast* and the *Adjust Forecast* SAP Fiori apps.
- CA-RT-CAR-INT - to report an incident for integration with the DDF/UDF modules and integration between the repository and consuming applications.
- CA-RT-CAR-ANA - to report an incident for SAP HANA content delivered with SAP Customer Activity Repository.
- CA-RT-CAR-OAA - to report an incident for Omnichannel Article Availability and Sourcing that is related to SAP Customer Activity Repository.
LO-MD-PL and LO-MD-OAA - to report an incident for Omnichannel Article Availability and Sourcing that is related to SAP S/4HANA or SAP Retail.
CEC-COM-BSC-OAA - to report an incident for Omnichannel Article Availability and Sourcing that is related to OAA standard extensions and OAA Data Hub extensions of SAP Commerce, integration package for SAP for Retail.
- CA-DDF-RT-PPR - to report an incident for omnichannel promotion pricing (OPP) that is related to the price and promotion repository.
- CA-DDF-RT-PPS - to report an incident for omnichannel promotion pricing (OPP) that is related to the promotion pricing service.
- CA-RT-CAR - to report an incident for general issues with SAP Customer Activity Repository that cannot be easily classified into one of the categories above.

More Information

- For information about reporting incidents, see the following:
 - SAP Support Portal at <https://support.sap.com/en/my-support/product-support.html>
 - SAP Note [1773689](#) - *How to add logon credentials (S-User ID and password) securely to a support incident - SAP ONE Support Launchpad*
- If the incident relates to an SAP HANA component, see SAP Note [1976729](#) for a component list.
- For contact information for your local customer interaction center, see SAP Note [560499](#).

6 Appendix

6.1 Transaction Log (TLOG) Data Model and Storage

POS data is captured in a format called a Transaction Log (TLOG). TLOGs capture all the attributes of a store's sales transaction. This information is used to log many attributes about the sale, such as customer information, sales price, discount price, quantities, item descriptions, and much more. Such information is used in backend store systems for sales auditing, reporting, and input in to additional Retail planning applications.

SAP Customer Activity Repository is an application that serves as a central repository for storing TLOG data. In addition to storing and providing many business functions that operate directly on the TLOG data (for example, Sales Audit), SAP Customer Activity Repository also captures and exposes the data in a standard way so that it can be easily consumed by analytical, planning, and other follow-on applications.

Business Transactions

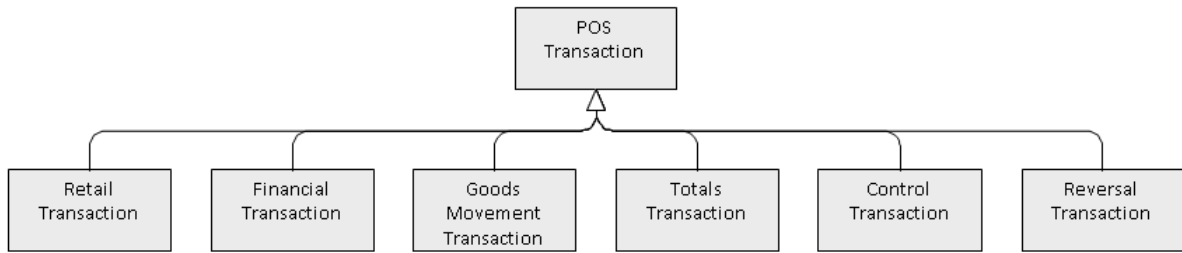
The POS transaction data model is the most important business object in the POS Inbound Processing Engine (PIPE). At the POS, different kinds of business transactions can be recorded by a cash register, for example:

- POS sales
- Cash pay-in/pay-out
- Inventory Adjustments (for example, spoilage or unexpected goods receipt)
- Register closing (for example, count cash amount in the till)
- Statistical events (for example, cash drawer opened, store opening, and cashier log on)

In order to simplify the programming interfaces, the SAP Customer Activity Repository POS transaction data model is based on a generic approach that allows different kinds of POS transactions to be stored in the same database tables. A qualifier, called a `transaction type code`, is used to distinguish which kind of business transaction the POS transaction reflects. For one business transaction, there can be more than one transaction type. For example, a retail transaction can be either a sale or an employee sale, but both are sales transactions.

The figure Business Transaction Types for POS Transactions shows the business transactions that can be used to classify generic POS transactions. Technically, this classification is used to define a subset of segments that can be used by a specific business transaction. For example, a financial transaction may not include any goods movement items because this sub-structure belongs to goods movement transactions only.

Located at the header level of a POS transaction, the business transaction field uses fixed values to indicate the transaction type, as shown in this figure.



Business Transaction Types for POS Transactions

The following sections describe the relationship of the POS transactions on the segment level. Segments are stored in internal tables. They can contain more than one line. Although it is technically possible to store multiple lines in all segments, some segments may contain only a single record. In the following sections, the hierarchy of the segments and the cardinality is explained in detail.

Common Segments

Transaction Header

All POS transactions share the same header segment. Some header fields are mandatory and must be filled out in order for SAP Customer Activity Repository to process the data. Some header fields are optional in SAP Customer Activity Repository but are required from a business point of view.

The transaction header contains the following information:

Transaction Header Fields

Field Name	Description	Role in SAP Customer		Data Type/Length
		Activity Repository	Role at POS	
Retail Store ID	A unique identifier of the store where the POS transaction was entered. This field usually contains the customer number of the plant in ERP to which the store is assigned.	Key	Key	Char/10

Field Name	Description	Role in SAP Customer		Data Type/Length
		Activity Repository	Role at POS	
Business Day	The date to which the POS transaction is assigned. In Retail, it is referred to as the business day or posting date. In some cases, the business day is not the actual date on which the transaction transpired but to which it is assigned. For example, in a 24/7 business, a cashier's work shift can be from 23:00 until 03:00 and sales transactions that transpire after 00:00 are assigned to the previous day.	Key	Key	Date
Transaction Index	A counter that uniquely identifies POS transactions for the same store and same business day. This field is available only in SAP Customer Activity Repository and has no representation in the external interfaces or at the POS.	Key	-	Integer/4
Transaction Type Code	A four-digit code used to indicate the type of POS transaction.	Mandatory Attribute	Mandatory Attribute	Char/4
Workstation ID	A number that identifies the cash register or machine where the POS transaction was entered.	Optional Attribute	Key	Char/10

Field Name	Description	Role in SAP Customer		Data Type/Length
		Activity Repository	Role at POS	
Transaction Number	A number used to identify a POS transaction. In SAP Customer Activity Repository, the key fields (store, business day, workstation ID, transaction type code, and transaction number) do not need to be unique because SAP Customer Activity Repository uses a counter at the database level. However, the key field combination must be unique at the POS.	Optional Attribute	Key	Char/20
Begin Time Stamp	The date and time the POS transaction was started. When the cashier enters a new POS transaction, the time is stored in the transaction header. This information is required to put the transactions in sequential order, and is also used to assign retail transactions to totals transactions (see Totals Transactions) for the balancing or short/over calculation.	Mandatory Attribute	Mandatory Attribute	Char/14

Field Name	Description	Role in SAP Customer		Data Type/Length
		Activity Repository	Role at POS	
End Time Stamp	The date and time the POS transaction was completed. This field is mandatory in SAP Customer Activity Repository. It may be filled with the begin time stamp, unless a second time stamp is available. By completing a POS sale, the time stamp is also entered in the transaction header.	Mandatory Attribute	Optional Attribute	Char/14
Department	A number that identifies the department of the store.	Optional Attribute	Optional Attribute	Char/10
Operator ID Qualifier	It is used to identify the cashier who entered the POS transaction or the user who entered the business transaction.	Optional Attribute	Optional Attribute	Char/30
Operator ID	It is used to identify the cashier who entered the POS transaction or the user who entered the business transaction.	Optional Attribute	Optional Attribute	Char/30

Field Name	Description	Role in SAP Customer		Data Type/Length
		Activity Repository	Role at POS	
Transaction Currency	The transaction currency to which all retail line items are assigned. For retail transactions, this field is optional because all retail transactions in the same store are usually assigned to the same currency, even if the payment can be done in different currencies. The transaction currency can differ from the tender currency. If the transaction currency is not provided, a default currency must be defined in the SAP Customer Activity Repository Customizing. However, for tender totals, the field is mandatory as there can be totals for different currencies.	Attribute	Optional attribute	Char/5
Partner ID Qualifier	This field indicates if the transaction is from a customer or business partner.	Optional Attribute	Optional Attribute	Char/1
Partner ID	It is used to store the SAP customer number, SAP personnel number, or a free text value.	Optional Attribute	Optional Attribute	Char/13
Receipt Handling Time	Specifies the time, to the millisecond, required to complete the handling of the receipt.	Optional Attribute	Optional Attribute	Dec/13,3

Field Name	Description	Role in SAP Customer		Data Type/Length
		Activity Repository	Role at POS	
Register Time	Specifies the time, to the millisecond, required for the registering of the transaction line items.	Optional Attribute	Optional Attribute	Dec/13,3
Tendering Handling Time	Specifies the time, to the millisecond, required to complete the transaction payment (tender).	Optional Attribute	Optional Attribute	Dec/13,3
Pause Time	Specifies the time, to the millisecond, that the cash register spends in pause mode between two transactions.	Optional Attribute	Optional Attribute	Dec/13,3
Training Time	Specifies the time, to the millisecond, that the cash register spends in training mode.	Optional Attribute	Optional Attribute	Dec/13,3
Drawer Number Used at POS Client	Specifies the cash drawer identifier used at a POS client.	Optional Attribute	Optional Attribute	Char/10
Customer ID from POS	Specifies the customer identifier.	Optional Attribute	Optional Attribute	Char/16
Customer Age	Specifies the age of the customer.	Optional Attribute	Optional Attribute	Integer/5
Customer Identifier Entry Method	Specifies the method used to enter the customer ID.	Optional Attribute	Optional Attribute	Char/1
Reference to Original Receipt for Retail Store ID	Specifies the retail store identifier of the referenced transaction.	Optional Attribute	Optional Attribute	Char/10
Referenced to Original Receipt for Posting Date	Specifies the posting date of the referenced transaction.	Optional Attribute	Optional Attribute	Date

Field Name	Description	Role in SAP Customer		Data Type/Length
		Activity Repository	Role at POS	
Reference to Original Receipt for Workstation ID	Specifies the POS number (cash register number) of the referenced transaction.	Optional Attribute	Optional Attribute	Char/10
Reference to Original Receipt for Transaction Number	Specifies the transaction identifier (receipt number) of the referenced transaction.	Optional Attribute	Optional Attribute	Char/20
Reference to Original Receipt for Start Timestamp	Specifies the start timestamp, as appears on the referenced transaction	Optional Attribute	Optional Attribute	Char/14
Reference to Original Receipt for Line Item Number	Specifies the original line item number of the referenced transaction.	Optional Attribute	Optional Attribute	Char/10
Reason	Specifies the reason code for referencing data from the original receipt.	Optional Attribute	Optional Attribute	Char/4
Logical System	Identifies the source system for data	Optional Attribute	Optional Attribute	Char/10

Post Void Details

Post void details are included in the header information. Post void details provide two types of information:

- A flag to mark a transaction to be voided
- A reference to another transaction that was voided. Note that this information can only be part of a post void transaction. See Post Void Transactions.

Any POS transaction can be flagged to be voided; therefore the structure for post void details can be used in combination with all business transaction types. However, only post void transactions can contain a reference to a voided transaction.

SAP Customer Activity Repository tasks can be configured to filter out voided transactions automatically.

For more information on post void details, see Post Void Transactions.

Extensions

The POS transaction data model used by SAP Customer Activity Repository includes predefined locations where you can insert extension segments to enhance the standard data model with customer-specific fields.

Extensions can exist on different levels in a transaction, therefore extension segments can occur on the transaction header level, on the item level (for example, retail line item, tender, or goods movement item), or even lower than the item level.

For more information, see Extensibility and Extensions.

Transactional Additional

The transaction additional segment contains information about the entry of the transaction, for example, a transaction reason code or a training transaction indicator.

Retail Transactions

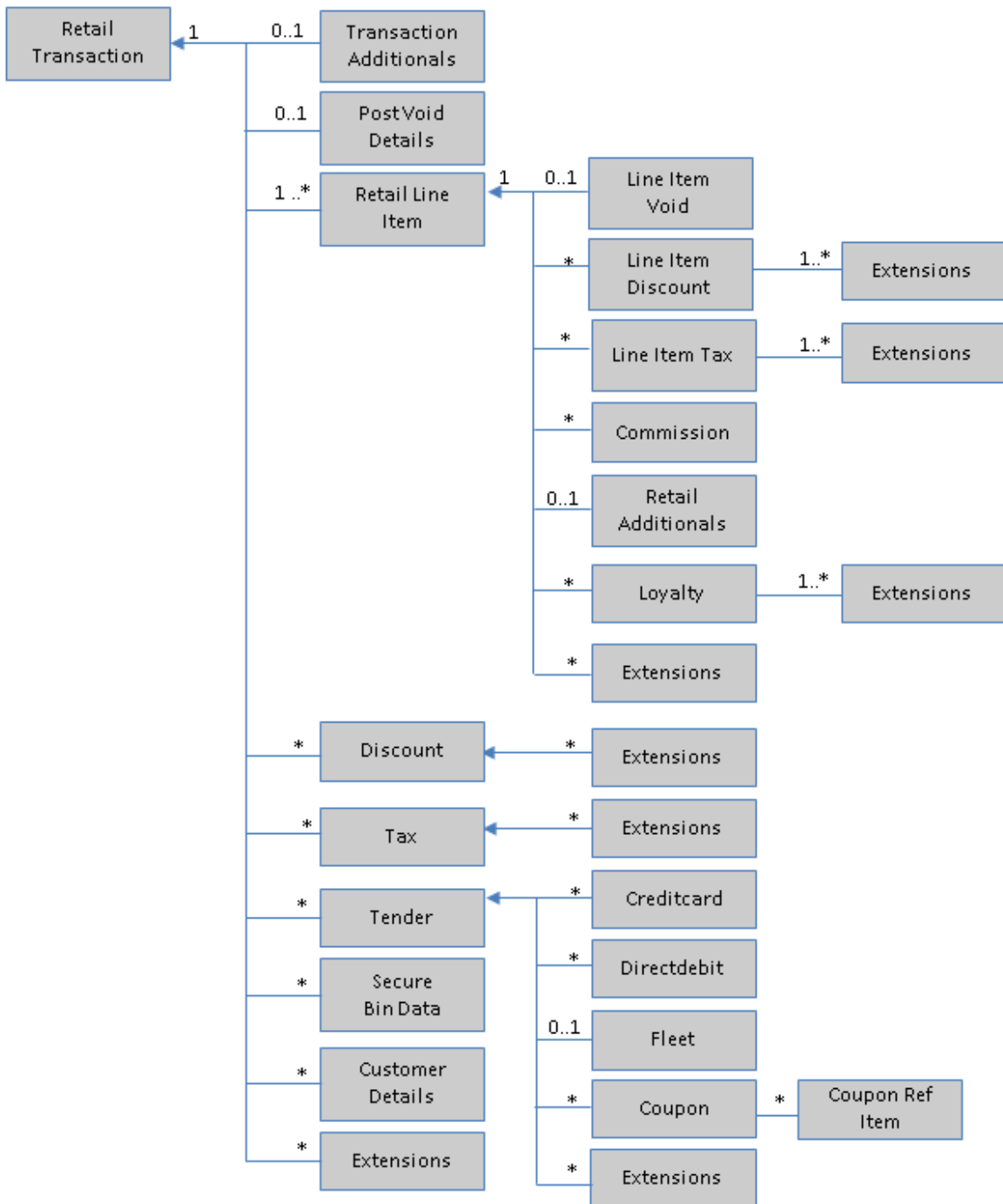
A retail transaction contains the most relevant information about a POS sale, such as retail line items and tender information.

A retail line item reflects a quantity of a single article that was scanned or manually entered at the POS. For each retail line item, there can be discounts, taxes, loyalty information or commission information that applies to it. Depending on the business case or business use, discounts, taxes, and loyalty information may also exist at the transaction level.

Some fields in the retail line item are used very rarely. These are stored in a sub-structure called `retail additional`.

After all items have been entered at the POS, and the customer has paid, the relevant information is stored in the `tender` segment, which stores information about the means of payment. For credit card or debit card payments, there are sub-structures that contain information about the card number, card owner, and the authorization code sent by the credit card authorization service. If the credit card information is available only in an encrypted format, it is stored in the `secure bin data` segment.

Information about the customer, such as age, phone number and address, can be added at the POS by use of the `customer details` structure which offers the same kind of enhancement concept as the `extensions` structures (see Extensibility and Extensions).



Structure of a Retail Transaction

Totals Transactions

Totals transactions are used to process aggregated information for different kinds of POS transactions such as:

- Retail Totals: Aggregated retail amount and number of items for each retail type code
- Tax Totals: Aggregated tax amount and number of items for each tax type code
- Discount Totals: Aggregated reduction amount and number of items for each discount type code

- **Tender Totals:** Aggregated tender amount, number of items, actual amount, short amount, over amount, removed amount, and other details for each type code
- **Cashier Totals:** Aggregated statistical information for loss prevention purposes, for example, the number of retail transactions with a value of zero, the number of cash drawer openings, and other details

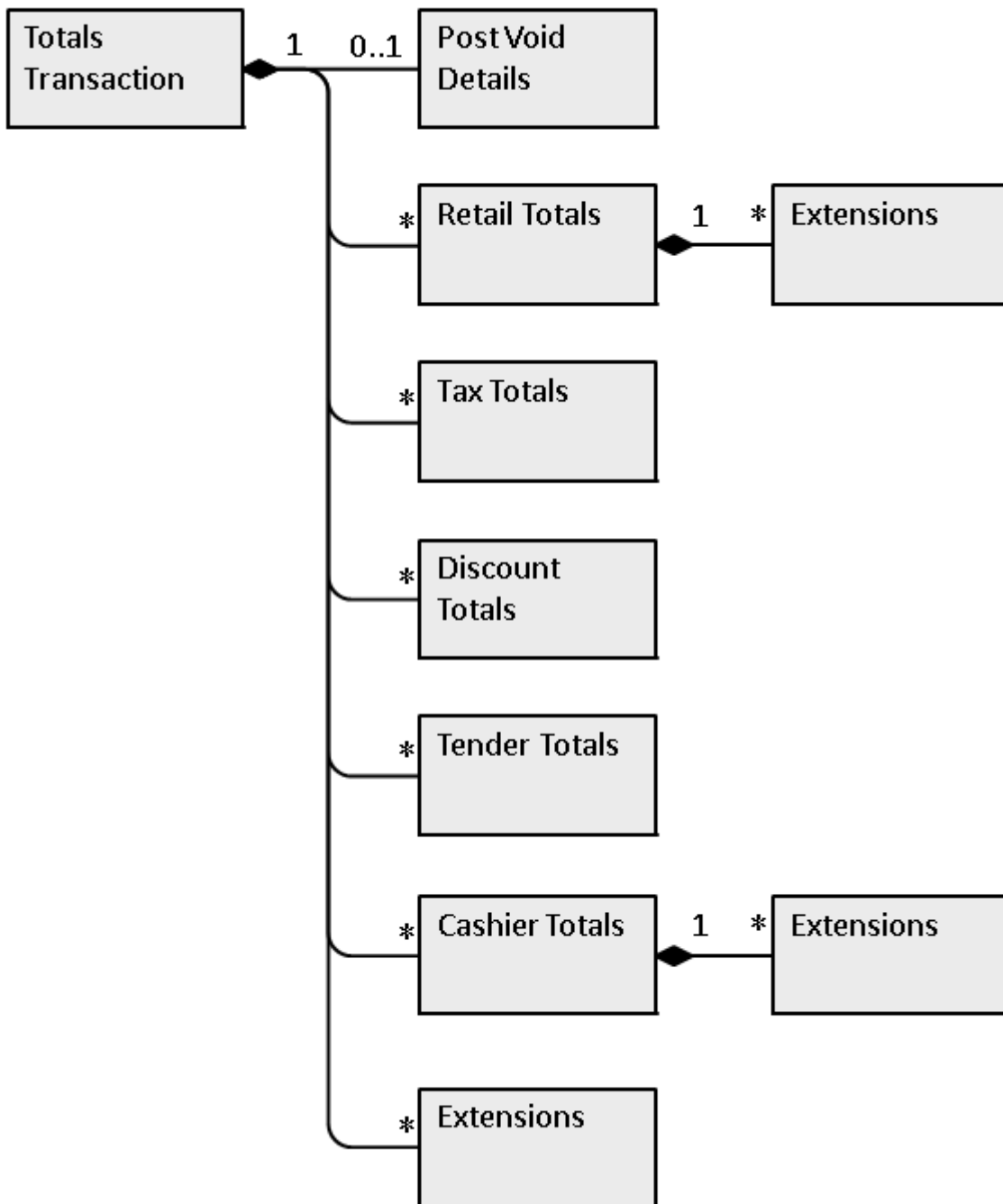
At the end of a day or a cashier shift, the cash register can send a summary record that contains these different kinds of totals.

The summary information has different purposes:

- **Technical Balancing:** Identifies missing or duplicate detailed information by comparing the summary records and POS transactions
- **Short/Over Processing:** Identifies differences between the actual amount and the expected tender amount (especially cash) at a workstation or cashier level, and sends the differences to financials
- **Loss Prevention:** Identifies fraudulent activities at the POS by use of statistical patterns, especially the cashier totals

Technically, it is possible to include different kinds of totals in the same totals transaction.

As a rule, the two time stamps that are part of the transaction header are used to identify the time interval for which the totals have been calculated. If the attributes at the header level, such as operator ID or workstation ID (see Transaction Header) are filled, the summary information is associated to a specific cashier or cash register. Otherwise they are valid for all cashiers or workstations.



Structure of a Totals Transaction

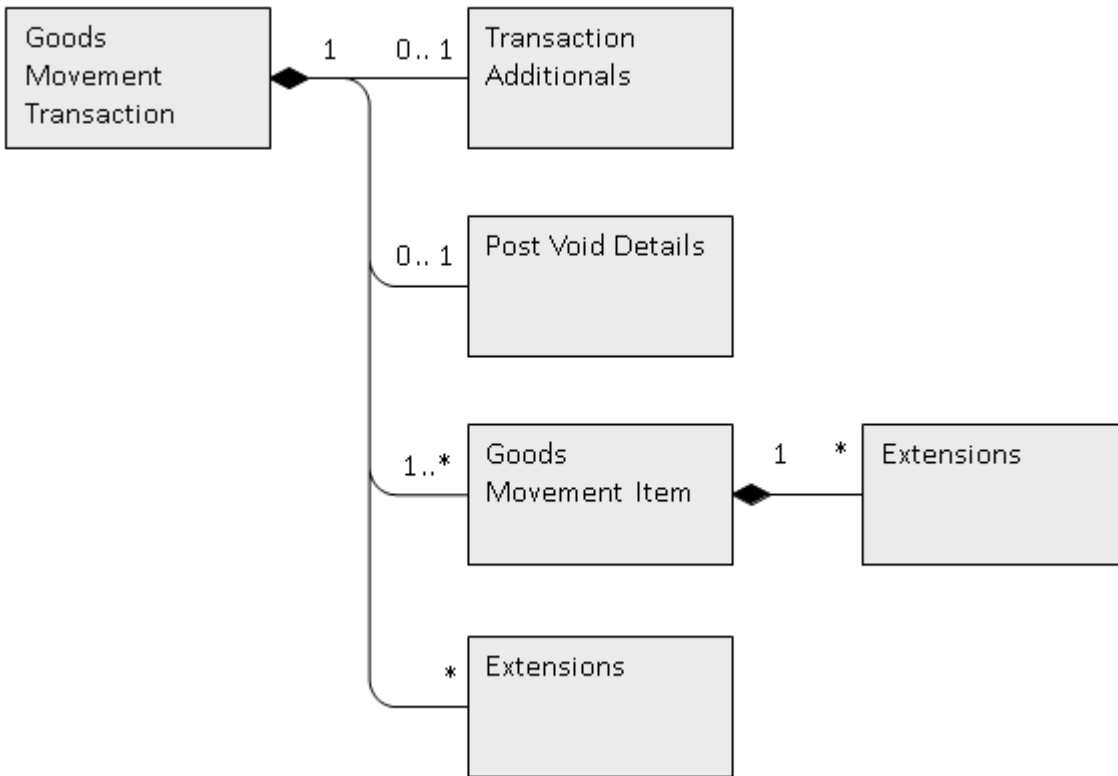
Goods Movements

Goods movement transactions are used to enter goods movements at the POS. They can be entered for reasons such as:

- Spoilage: In this case, the quantity of goods available for sale is decreased and has to be adjusted in inventory management

- Transfer posting: Goods can be transferred from one store to another without any kind of settlement
- Reserve goods: A customer can call and ask to reserve an article for pickup the next day. If this transaction is to be reflected in the inventory account, the article can be transferred from the stock at hand to the reserved stock.

The goods movement transaction consists of a transaction header and a number of goods movement items, reflecting the inventory-related movement at the article level.



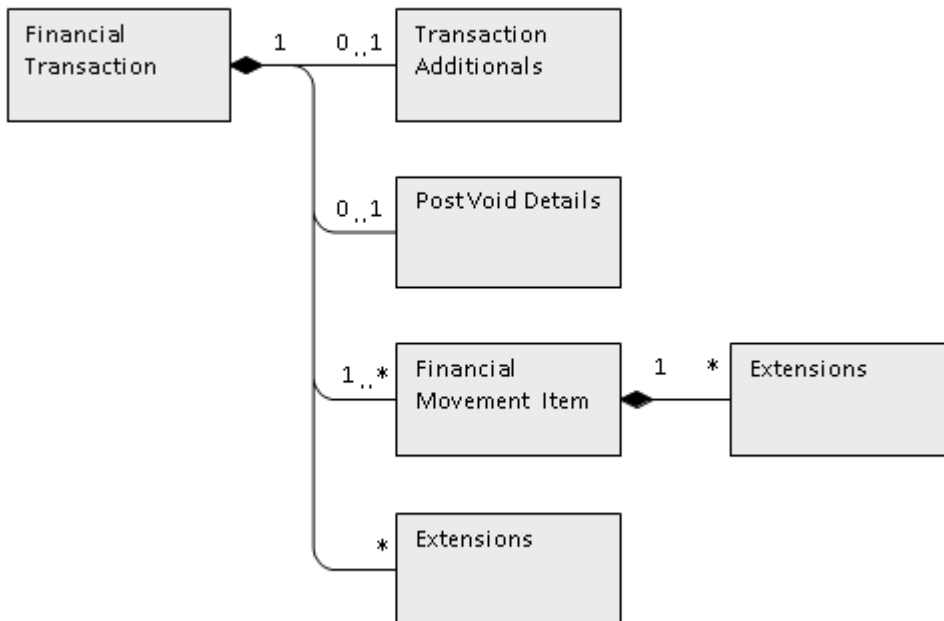
Structure of a Goods Movement Transaction

Financial Movements

Financial movements represent financial transactions with or without an impact on the cash amount at the POS, such as:

- Cash removals or deposits: Money is removed from the cash register, for example, as a deposit it is brought to the bank, or new change is paid-in. In these cases, the financial amount is moved within the company.
- Pay-In and Pay-Out Transactions: For example, money is paid-in for services, wages, or a pay-in for a customer, or paid-out for wages. In these cases, the financial amount is moved out of or into the company.

The financial transaction consists of a `transaction` header and a financial movement item, which contains an amount of money to be booked on a certain account.



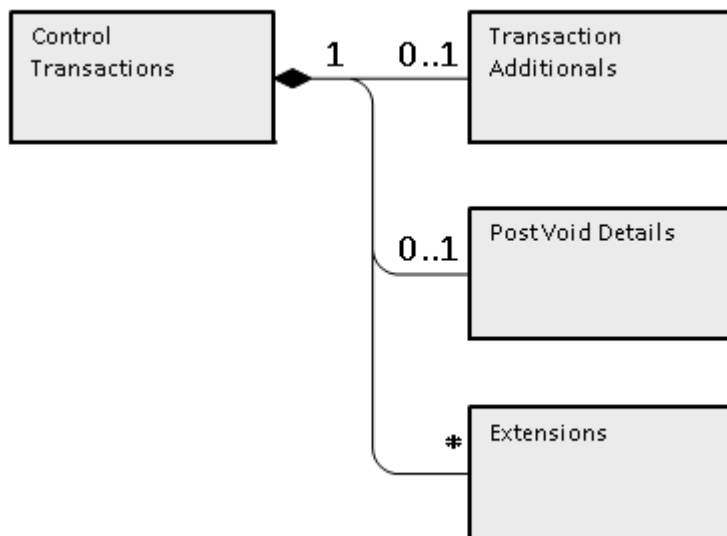
Structure of a Financial Movement Transaction

Control Transactions

Control transactions represent events that are tracked for statistical reasons only or to document certain processes, such as:

- Cashier Logon/Logoff or Logon Attempt: For loss prevention purposes, data about the time when a cashier logged on and off a cash register is collected
- Open Register/Close Register: For loss prevention purposes, data about the time when a cash drawer was opened without a corresponding sales transaction is collected
- Repeat Printout: Records when a cashier prints out for a second time
- Store Opening: The time the store opens
- Suspend/Retrieve Transaction: For detecting fraud patterns, data about suspended transactions is collected

A control transaction consists of a transaction header. It is classified by a transaction type code and a timestamp. If more information needs to be transferred, an extension segment can be used.



Structure of a Control Transaction

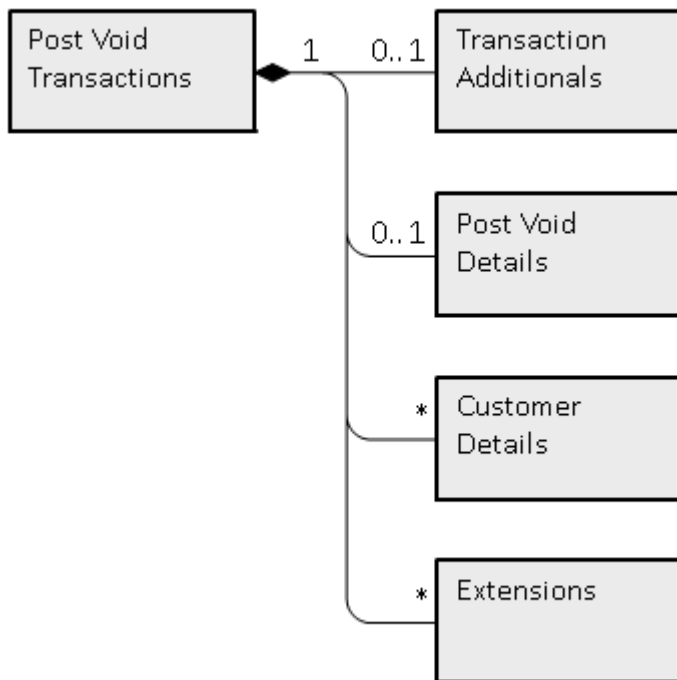
Post Void Transactions

A post void transaction represents the reversal of a POS transaction that was previously processed. For several business reasons and in unusual cases, it can be necessary to cancel an entire POS transaction, for example, if a POS sale has been completed but the customer is not able to pay, or a goods movement was booked by mistake.

There are two possible post void scenarios:

1. The original POS transaction has already been processed in the back-end system.
In a trickle-feed scenario, POS transactions are sent to SAP Customer Activity Repository many times during the day. In this case, the original POS transaction has already been processed and can no longer be marked as a voided transaction at the cash register.
2. The original POS transaction has not yet been transferred to the back-end system.
Because sales transactions are uploaded only once a day, the cash register will automatically flag the original POS transaction to be voided. In this case, no post void transaction is necessary because the original sale can be flagged as a voided sales transaction.

In the second case, the post void transactions need to be transferred to SAP Customer Activity Repository because the cash register has already marked the original transaction to be "invalid". If this is technically not possible or if the first case applies, the reversal processing needs to be done in SAP Customer Activity Repository.



Post Void Transactions

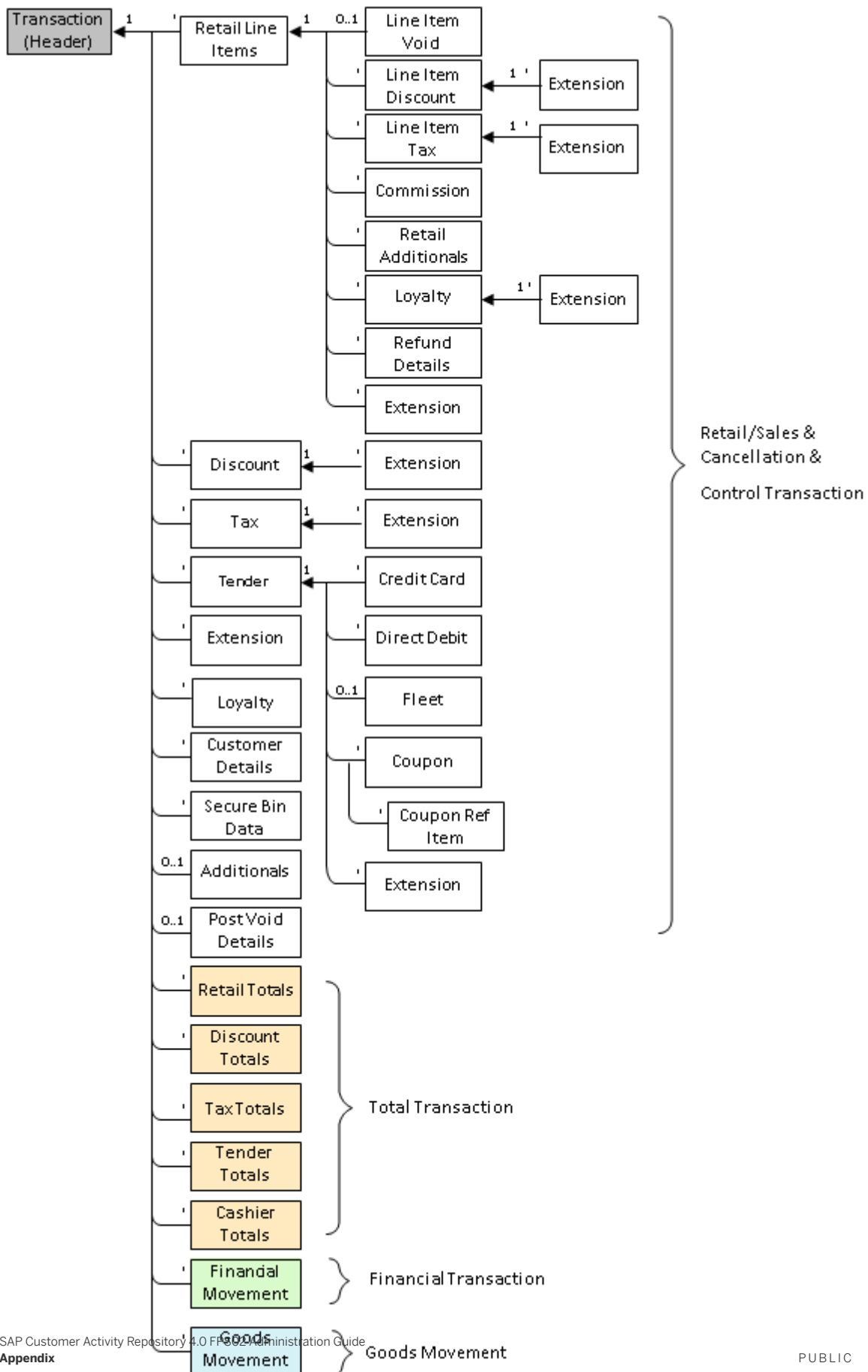
POS Transaction Tables (/POSDW/TLOGF)

In SAP Customer Activity Repository, POS transactions are stored in one table, the `/POSDW/TLOGF` table. This table has the following characteristics:

- Persisted only in the SAP HANA database
- No BLOB fields
- Column-based
- Can store up to two years of non-aggregated POS transaction data. Note that the amount of data stored is deployment-specific and is determined by the customer.

/POSDW/TLOGF Table

In the SAP Customer Activity Repository application layer, `/POSDW/TRANSACTION_INT` structure is the internal representation of the POS transaction data.



In the database layer, the POS transaction data is stored in the `/POSDW/TLOGF` table.

The `/POSDW/TLOGF` table is a column-based, flattened version of the `/POSDW TRANSACTION_INT` structure, where all the fields of the structure are stored in one table.

Flattening the TLOG Data Model into `/POSDW/TLOGF`

As described in the previous sections, POS transactions are stored as a tree structure in `/POSDW/TRANSACTION_INT`. The root node of a POS transaction contains header information such as transaction type and transaction number. The header fields are common to all POS business transaction types. In addition to the header fields, there are tables in the data structure that represent information from different business transaction types.

In order to transform this tree structure into a flat table (that is, a table that contains no additional tables), the approach is similar to the approach previously used by SAP POS DM 1.0 to supply BW DataSources: a record qualifier attribute is introduced for each row. This is not the same record qualifier that was used for POS analytics. Although similar, the `/POSDW/RECORDQUALIFIERID` data element is specific to the `/POSDW/TLOGF` table. For more information, see SAP Note [811393](#).

For a flattened TLOG data model (`/POSDW/TLOGF`), the following record qualifiers are used:

Record Qualifiers

Record Qualifier	Description
1	Transaction Header
2	Post Void Details
3	Additional
4	Customer Details
5	Retail Line Item
6	Discount
7	Discount Extension
8	Tax
9	Tax Extension
10	Line Item Void
11	Line Item Discount
12	Line Item Discount Extension
13	Line Item Tax
14	Line Item Tax Extension
15	Line Item Commission

Record Qualifier	Description
16	Line Item Extensions
17	Line Item Retail Additional
18	Line Item Loyalty
19	Line Item Loyalty Extension
20	Line Item Refund Details
21	Tender
22	Financial Movement
23	Goods Movement
24	Goods Movement Extension
25	Extension
26	Loyalty
27	Loyalty Extension
29	Financial Movement Extension
30	Tender Credit Card
31	Tender Direct Debit
32	Tender Fleet
33	Tender Extension
34	Retail Totals
35	Tax Totals
36	Tender Totals
37	Cashier Totals
38	Cashier Totals Extension
39	Discount Totals
40	Tender Coupon

6.2 Extensibility and Extensions

As comprehensive as the SAP Customer Activity Repository POS transaction data model is, you can enhance it if you need to store non-standard data directly in each transaction record.

For example, you can store comments that a cashier enters about a particular POS transaction directly in the POS transaction log. There are no standard fields to store cashier comments in the TLOG data model, therefore you use an extension segment.

Extension segments support customer-specific fields by storing them without having to alter the table definition. The extension segment concept also provides customers with the flexibility to store and process the extensions together with the rest of the transaction.

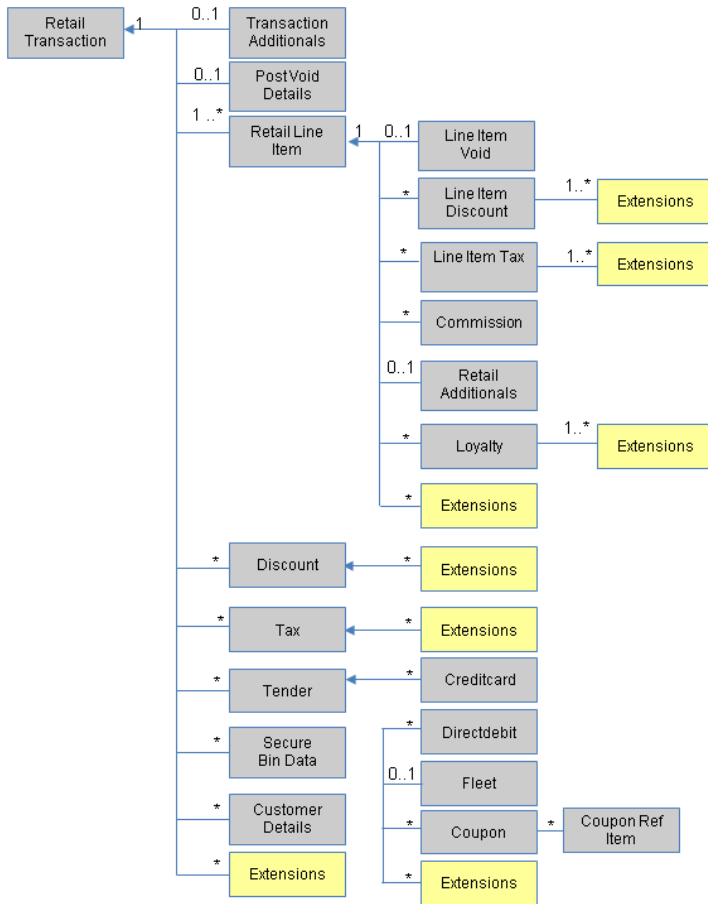
Extensions and the Internal TLOG Structure (/POSDW/TRANSACTION INT)

The SAP Customer Activity Repository POS transaction data model handles customer enhancements and extensions by including tables of name-value pairs (/POSDW/TT_EXTENSIONS with line type /POSDW/EXTENSIONS) at predefined locations as extension segments.

Structure /POSDW/EXTENSIONS	Customer Enhancements
Include structure /POSDW/EXTENSIONS_FI	Customer Enhancements
Include structure /POSDW/EXTENSIONS_FD	Customer Enhancements - Database Fields
FIELDGROUP	/POSDW/FIELDGROUP Field Group CHAR 5
FIELDNAME	/POSDW/FIELDNAME Field Name CHAR 10
FIELDVALUE	/POSDW/FIELDVALUE Field Value CHAR 40
Include structure /POSDW/EXTENSIONS_FU	User Interface Data: Customer Extension

/POSDW/EXTENSIONS Structure

These extensions exist on different levels: there are extension segments at the header level, at the item level (such as retail line items, tender movement items or goods movement items), and at lower levels. The field names can be grouped in order to reproduce data structures.



Extension Level Details

Extensions and the Physical Data Storage

By default, customer extensions are carried through and stored in the `/POSDW/TLOGF` table as a name-value pair, but using dedicated extension record qualifiers.

For example, if a transaction header includes the cashier's comment for the transaction, a record (with a record qualifier 25) is inserted in the `/POSDW/TLOGF` table, and this record includes the extensions information as a name-value pair. `FIELDGROUP` can be set to `COMNT` (comments), `FIELDNAME` to `CASHIER` (another value could be `MANAGER`) and `FIELDVALUE` can store the comment, for example, "Customer was happy about sale on jeans".

In the /POSDW/TLOGF table, you would see the following:

Data Browser: Table /POSDW/TLOGF Select Entries 200											
Table: /POSDW/TLOGF											
Displayed Fields: 17 of 240 Fixed Columns: 5 List Width 0250											
MANDT	RETAILSTOREID	BUSINESSDAYDATE	TRANSINDEX	ROWKEY	PARENTKEY	RECORDQUALIFIER	TRANSYPECODE	...	FIELDGROUP	FIELDNAME	FIELDVALUE
100	R100	01.10.2012	1	0	0	1	1001		COMNT	CASHIER	Customer was happy about sale on jeans

Example in /POSDW/TLOGF table

Storing Extension Segments in a Separate Table

If you have a large number of extensions, they can significantly increase the size of the /POSDW/TLOGF table, and potentially slow down database operations on the table.

To speed up database operations on the /POSDW/TLOGF table, you can store extension segments in a dedicated table (/POSDW/TLOGF_EXT) by enabling the *Store Extensions in Separate Table* option in the *Define General Settings* Customizing activity.

The setting of the *Store Extensions in Separate Table* option affects how POS transaction data is stored in the database. This option should be set after consultation with a SAP Customer Activity Repository administrator, and you should not change the selected setting of the *Store Extensions in Separate Table* option needlessly.

Only transactions processed after the *Store Extensions in Separate Table* option is enabled will have their extension segments stored in the /POSDW/TLOGF_EXT table. For all the POS transactions already stored in the /POSDW/TLOGF table, you must run the **Transfer POS Transaction Extension Segments Report** (transaction /POSDW/REFE) to move the extension segments from the /POSDW/TLOGF table to the /POSDW/TLOGF_EXT table.

If you have been storing extension segments in the /POSDW/TLOGF_EXT table, you can use the **Transfer POS Transaction Extension Segments Report** to move the extension segments back to the /POSDW/TLOGF table.

Note that the actual persistence location of extension segments (/ POSDW/TLOGF or / POSDW/TLOGF_EXT) has no impact on the inclusion of these extension segments in their corresponding transaction records during task processing, display in the POS Workbench or analysis.

Mapping Extension Segments

If you have a large number of extensions, they can significantly increase the size of the / POSDW/TLOGF and/or the / POSDW/TLOGF_EXT tables, and potentially slow down database operations on the tables. Additionally, if you would like to consume extension data for analytical purposes, the standard storage of extensions may not yield adequate performance for the retrieval of this type of information.

To optimize the storage of extension segments, you can define how a given name-value pair for a specific store extension segment should be mapped instead into a new dedicated field within either the / POSDW/TLOGF or / POSDW/TLOGF_X tables by providing this criteria in the *Maintain TLOGF Customer Enhancement Field Mapping* Customizing activity. The new dedicated fields are defined using an APPEND structure on the relevant targeted table (/ POSDW/TLOGF or / POSDW/TLOGF_X).

The definition of extension field mapping criteria in the *Maintain TLOGF Customer Enhancement Field Mapping* customizing activity affects how POS transaction data is stored in the database. This option should be set after consultation with a SAP Customer Activity Repository administrator. You should not change the defined criteria of the *Maintain TLOGF Customer Enhancement Field Mapping* Customizing activity without taking proper precautions, since any changes can have potentially negative impacts.

Only transactions processed after the definition of the field mapping criteria in the *Maintain TLOGF Customer Enhancement Field Mapping* Customizing activity will have their extension segments stored in the / POSDW/TLOGF or / POSDW/TLOGF_X table. For all the POS transactions already stored in the / POSDW/TLOGF & / POSDW/TLOGF_EXT tables, you must run the *Transfer POS Transaction Extension Segments* report (transaction / POSDW/REFE) to move the extension segments from the / POSDW/TLOGF or / POSDW/TLOGF_EXT table to the proper targeted field of the targeted table (either the / POSDW/TLOGF or / POSDW/TLOGF_X table).

If you have been previously mapping extension segments in the / POSDW/TLOGF and/or / POSDW/TLOGF_X tables and you wish to make a change or undo this mapping, you can use the *Transfer POS Transaction Extension Segments* report to move the extension segments back to the regular name-value pair storage in the / POSDW/TLOGF or / POSDW/TLOGF_EXT table.

i Note

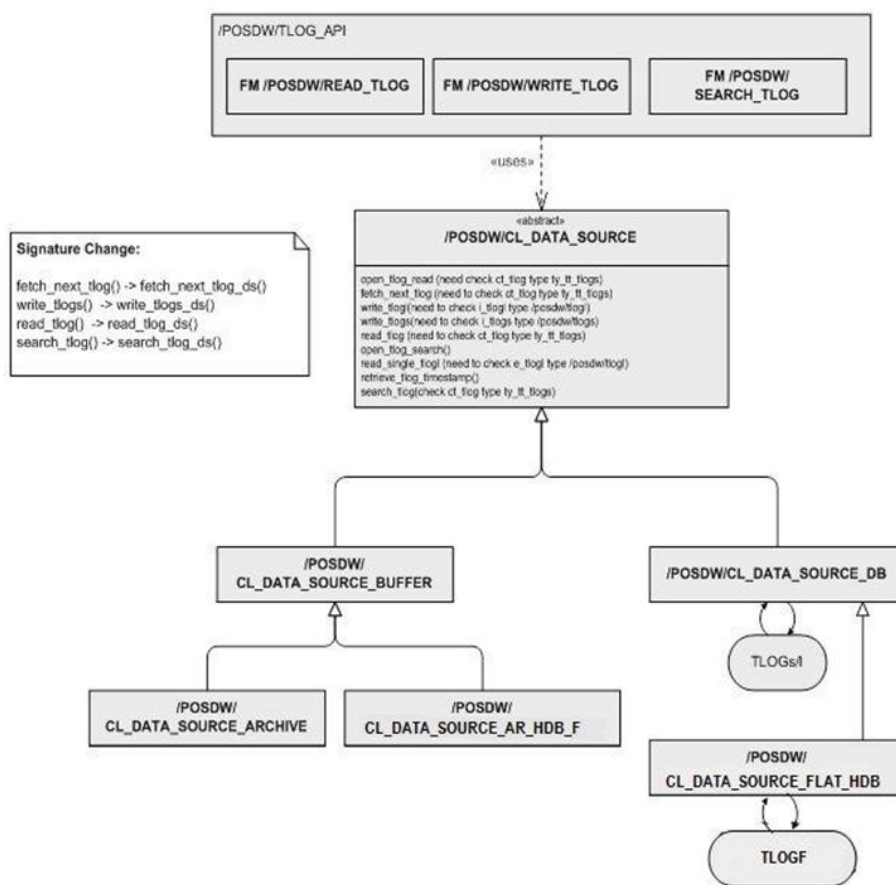
The actual persistence location of extension segments (/ POSDW/TLOGF, / POSDW/TLOGF_EXT, or / POSDW/TLOGF_X) has no impact on the inclusion of these extension segments in their corresponding transaction records during task processing, display in the POS Workbench or analysis.

6.3 TLOG API

The following function modules are used to perform standard CRUD operations on the `/POS DW/TLOGF` table:

- `/POS DW/READ_TLOG`
- `/POS DW/WRITE_TLOG`
- `/POS DW/SEARCH_TLOG`

These function modules are part of the `/POS DW/TLOG_API` function groups that reside in `► /POS DW/STRUC`
`► /POS DW/PIPE` `► /POS DW/DATABASE`.



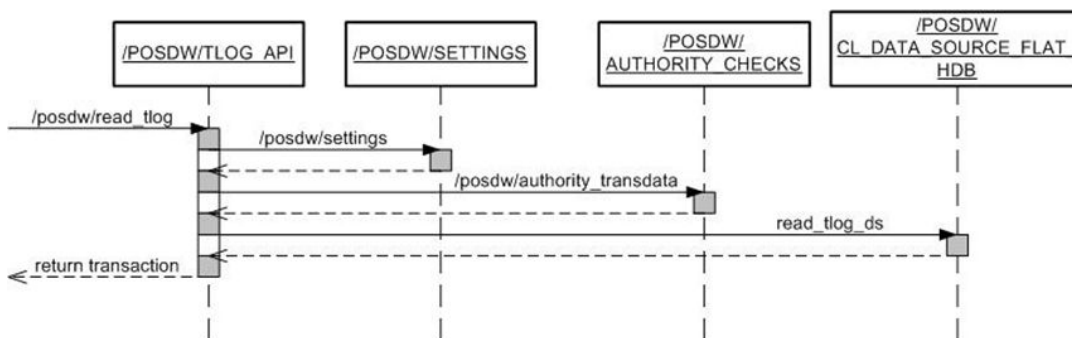
Structure of TLOG_API

The following APIs are used to perform standard CRUD operations on the `/POS DW/TLOGF` table:

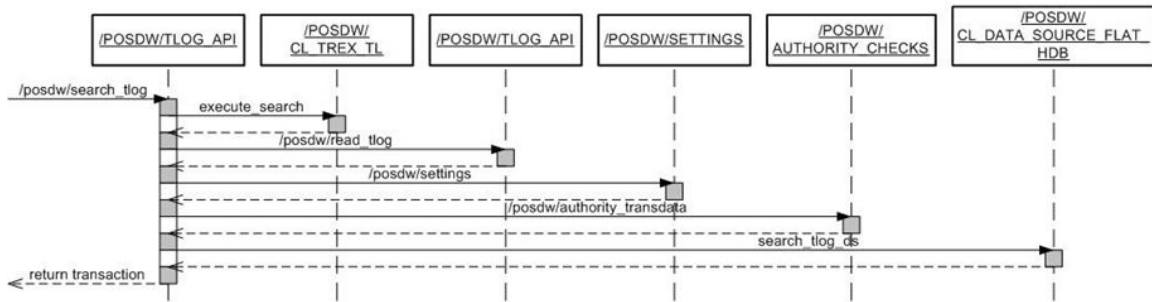
APIs used for the `/POS DW/TLOGF` Table

Name	Type	Description
<code>/POS DW/READ_TLOG</code>	Function Module	This function module reads the POS transactions from the POS transaction database.

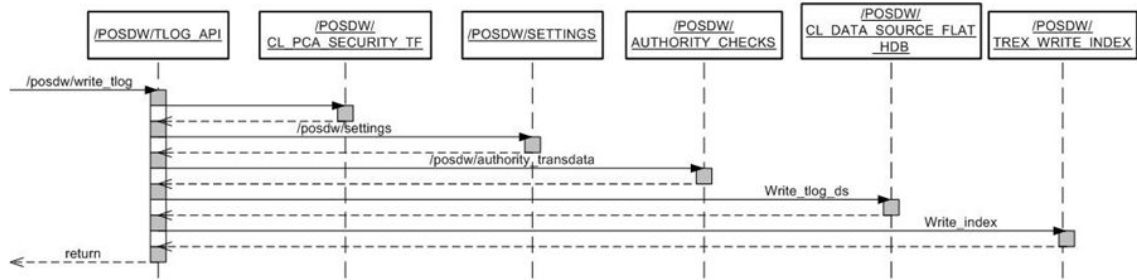
Name	Type	Description
/POSDW/SEARCH_TLOG	Function Module	This function module searches the POS transaction database for records matching the selection criteria.
/POSDW/WRITE_TLOG	Function Module	This function module writes the POS transactions to the POS transaction database. Existing records with the same key are overwritten.
/POSDW/CL_DATA_SOURCE_FLAT_HDB	Class	Represents the Data Access Object used to perform basic table CRUD operations.



Sequence Diagram for /POSDW/READ_TLOG Operation



Sequence Diagram for POSDW/SEARCH_TLOG Operation



Sequence Diagram for /POSDW/WRITE_TLOG Operation

Enhanced Fields

Enhanced fields are not stored in the /POSDW/TLOGF table. They are populated during the transaction checks and processing.

The only exceptions to this are the MATERIALNUMBER and the MERCHANDISECAT fields at the line item level. These enhanced fields are stored in the database because they are required by consuming applications.

Analytic Fields

Additional fields were added to the /POSDW/TLOGF for analytic purposes and to improve the performance of the queries built on top of the new TLOG data model.

The following table provides information about the analytic fields of the /POSDW/TLOGF:

/POSDW/TLOGF Analytic Fields

Field	Level	Purpose
TRANSCOUNTER	Header	Fixed value (1) used for counter based queries
BEGINDATE	Header	Transaction Date
BEGINTIME	Header	Transaction Begin Time
CALYEAR	Header	Transaction Year
CALMONTH	Header	Transaction Month
CALDAY	Header	Transaction Day
CALHOUR	Header	Transaction Hour
CALWEEK	Header	Transaction Week
TAXINC	Item	Amount of included taxes
TAXEXC	Item	Amount of excluded taxes
ITEMDISC	Item	Amount of item discounts
DISTDISC	Item	Amount of distributed discounts from the header level
DISTTAX	Item	Amount of distributed taxes from the header level
DISTTENDER	Item	Amount of distributed tender from the header level
DISTTAXEXC	Item	Amount of distributed excluded taxes from the header level
DISTVOID	Item	Amount of distributed voids from the header level
TASK_CANCELED	Item	Indicator for Canceled Task, distributed from the header level
RETL_ITEM_CAT	Item	Article category
RETL_ITEM_SCAT	Item	Article subcategory
RETAILDEBITFLAG	Item	Flag indicating whether the line item is of a debit type

Entity Relationships

In SAP POS Data Management component of SAP Customer Activity Repository, combined semantic keys are used as primary keys.

To ensure the uniqueness of every record, a child entity inherits its primary key from its parent. It then defines an additional field that is part of its own primary key.

Parent/child relationships are maintained using these semantic keys. Because a semantic key for a child is a combination of its parent's primary key and an extra field, the child primary key already contains its parent's primary key.

Extensibility

The extension mechanism used in SAP Customer Activity Repository is described in the Extensibility and Extensions section.

Structures

This following table provides information about the structures used in SAP Customer Activity Repository:

Structures of SAP POS Data Management Component in SAP Customer Activity Repository

Structure Name	Component	Component Type	Description
/POSDW/HEADER_ANALYTICS	TRANSCOUNTER	/POSDW/CONSTCOUNTER	Header Analytics data fields
	BEGINDATE	/POSDW/BEGINDATE	
	BEGINTIME	/POSDW/BEGINTIME	
	CALYEAR	/POSDW/CALYEAR	
	CALMONTH	/POSDW/CALMONTH	
	CALDAY	/POSDW/CALDAY	
	CALHOUR	/POSDW/CALHOUR	
	CALWEEK	/POSDW/CALWEEK	
/POSDW/ITEM_ANALYTICS	TAXINC	/POSDW/TAXAMOUNT	Header Analytics data fields
	ITEMDISC	/POSDW/REDUCTIONAMOUNT	
/POSDW/ITEM_DIST	DISTDISC	/POSDW/DISTDISC	Distributed data fields

Structure Name	Component	Component Type	Description
	DISTTAX	/POSDW/DISTTAX	
	DISTTENDER	/POSDW/DISTTENDER	
/POSDW/ITEM_DISTRIBUTED	.INCLUDE	/POSDW/RETAILLINEITEM_FK	Line item with distribution fields
	.INCLUDE	/POSDW/ITEM_DIST	

Table Types

The following table types are used in the SAP POS Data Management component of SAP Customer Activity Repository.

Table Types of SAP POS Data Management Component in SAP Customer Activity Repository

Name	Line Type	Description
/POSDW/TT_TLOGF	/POSDW/TLOGF	/POSDW/TLOGF table type
/POSDW/TT_TLOGF_EXT	/POSDW/TLOGF_EXT	/POSDW/TLOGF_EXT table type
/POSDW/TT_TLOGF_X	/POSDW/TLOGF_X	/POSDW/TLOGF_X table type
/POSDW/TT_TLOGF_CONTROL	/POSDW/TLOGF_CONTROL	Table type for control analytics
/POSDW/TT_ITEM_DISTRIBUTED	/POSDW/ITEM_DISTRIBUTED	Table of item distributed fields
/POSDW/TT_CUSTOMIZING_BUFFER	/POSDW/CUSTOMIZING_BUFFER	Customizing buffer table type

6.4 Enterprise Services

SAP Customer Activity Repository can make use of web services to receive and send data for different scenarios.

Use

You can use the web services for the following scenarios:

- Receive point-of-sale (POS) transactions from connected POS systems into SAP Customer Activity Repository (*Create Point Of Sale Transaction as Bulk*).

- Send POS transaction data from SAP Customer Activity Repository to SAP CRM (*Request Loyalty Membership Activity Journal as Bulk*).
- Receive master data and historical transaction data into the Demand Data Foundation (DDF) module in SAP Customer Activity Repository, to support modeling and forecasting scenarios.

Activities

You can find the web services in your SAP Customer Activity Repository system using transaction **SOAMANAGER**. In the *SOA Management* tool, select the *Service Administration* tab followed by *Web Service Configuration*. Once in *Web Service Configuration*, search for the required service.

Example

To find the *Create Point Of Sale Transaction as Bulk* service, specify the following search criteria:

- *Object Type*: *Service Definition*
- *Object Name*: `PointOfSaleTransactionERPBulkCreateRequest_In`

To find the *Request Loyalty Membership Activity Journal as Bulk* service, specify the following search criteria:

- *Object Type*: *Consumer Proxy*
- *Object Name*: `LoyaltyMembershipActivityJournalCRMBulkRequest_Out_V1`

i Note

If you cannot find a particular service in the *SOA Management* tool, see SAP Note [1884049](#) for a possible solution.

For detailed service descriptions, see the following sections.

6.4.1 Ad Content Processing

Definition

Manages the content of an advertisement, such as an advertisement graphic or a printed ad.

Technical Data

Entity Type

Process Component

Software Component Version	ESM TDM 1.2
Technical Name	AdContentProcessing
Namespace	http://sap.com/xi/ESM/ERP

Business Context and Use

The *Ad Content Processing* process component provides low resolution images that represent consumer products included in the retailers' merchandise assortment. This allows marketing specialists to create and revise the visual layout of promotional offers.

6.4.1.1 Advertisement Graphic

Definition

A graphic that appears in an advertisement.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	AdContentProcessing
Object Category	Business Process Object

Business Context and Use

The *Advertisement Graphic* business object is used by marketing specialists to create and revise the visual layout of promotional offers. Advertisement graphics are low resolution images that represent consumer products included in the merchandise assortment of a retailer. The transport of the images and layouts allows desktop publishing teams to complete the construction of printed promotional materials.

Low resolution images contain a relationship to existing products in the material master data.

6.4.1.1.1 Advertisement Graphic Replication In

Definition

An interface to receive the advertisement graphic data.

Technical Data

Entity Type	Service Interface
Category	Third-Party A2A
Direction	Inbound

Business Context and Use

The *Advertisement Graphic Replication In* contains an operation that receives image information.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under **► Cross-Application Components ► Demand Data Foundation ► Basic Settings ► Define Logical Systems** **▾**. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> **► <Version> ► Application Help ► SAP Customer Activity Repository ► Demand Data Foundation ► Integration Information ► Inbound Processing** **▾**.
- DDF allows customers to import and actually delete low resolution images from the system and from the MIME repository where images are stored. Various image formats are supported, such as .jpg, .gif, and .bmp. Along with the image or the URL, various image attributes are required to allow DDF to create advertising content and advertisement layouts. These attributes represent the promotional advertisement, which is then used as an export to their appropriate desktop publishing software.

- The *Advertisement Graphic Replication In* interface is designed to carry the actual images in binary format along with the metadata for these images. The binary format images are stored in the MIME repository on the SAP application server for DDF. The metadata of the images is loaded into the DDF.

6.4.1.1.1 Replicate Advertisement Graphic as Bulk

Definition

To replicate the advertisement graphics.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	AdvertisementGraphicReplicationBulkRequest_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	Third-party A2A
Direction	inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Replicate Advertisement Graphic as Bulk* service operation can be used by any industry for creating printed materials, which are used to communicate information to consumers.

Features

The inbound operation creates, updates, and deletes the image data.

Product images are required during the promotional planning process. Images can be assigned to one or more products. In addition, they can be imported to represent a theme; for example, a cow to promote chocolate. In this case, the picture does not have a product identifier. The image contains the path to the Multipurpose Internet Mail Extension (MIME) repository where the actual image is stored.

The operation includes the following main node:

- **Message Header**
Since the `AdvertisementGraphicBulkReplicationRequest_In` operation is enabled for bulk-handling, it is possible to send out more than one instance on advertising graphic object instances. The message header is defined at the bulk operation level and at the business object instance level. Either one of them must be filled while posting the inbound message. The receiver system first reads the details defined in the instance level message header. If this level is not defined, the system copies the detail from the bulk message header.

Message Types

- `Advertisement Graphic Replication Bulk Request`

Error Handling

The *Replicate Advertisement Graphic as Bulk* operation supports the Forward Error Handling (FEH) concept.

Notes on SAP Implementation

Enhancements

The `/DMF/SE_PMR_ADGRPHCRPLCT` Business Add-In (BAI) is available for this inbound operation. The BAI is used to enhance the inbound message, and it is defined as an external customer BAI. A default implementation is not delivered.

6.4.2 Assortment Management

Definition

Manages assortments, store layout elements, location fixtures, and consumer product groups. This management includes the creation, update, and deletion of new assortment or store layout elements. Store

layout elements can be assigned to assortments; an assortment can consist of one or more store layout elements. One or several store fixtures can be assigned to a store layout element.

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	AssortmentManagement
Namespace	http://sap.com/xi/ESM/ERP

Business Context and Use

The *Assortment Management* process component enables the product group hierarchy (also known as article hierarchy) data.

6.4.2.1 Consumer Product Group Hierarchy

Definition

A group hierarchy of consumer products is an arrangement of product groups according to category management aspects. It is used to optimize product sales and planning business key figures, such as revenue, purchase budget, and planning assortments. Subordinate product groups represent a semantic refinement of the respective superordinate product group.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	ConsumerProductGroupHierarchy
Object Category	Master Data Object

Business Context and Use

The *Consumer Product Group Hierarchy* business object can be used to do the following:

- Create custom product groups.
- Set areas of responsibility for users.

6.4.2.1.1 Consumer Product Group Hierarchy Replication In

Definition

An interface to receive the product group hierarchy data.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Consumer Product Group Hierarchy Replication In* service interface contains an operation that receives the product group hierarchies.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under **► Cross-Application Components ► Demand Data Foundation ► Basic Settings ► Define Logical Systems ▾**. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> **► <Version> ►**

6.4.2.1.1.1 Find Consumer Product Group Hierarchy by Elements

Definition

To find a consumer product group hierarchy by elements.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	ConsumerProductGroupHierarchyTDMByElementsQueryResponse_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	inbound
Mode	Synchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Find Consumer Product Group Hierarchy by Elements* service operation is used when a business application requires information about the group hierarchy of consumer products. It also provides data to a reporting system that uses the consumer product group hierarchy.

Features

Message Types

- `ConsumerProductGroupHierarchyTDMyElementsQuery`
Receives data for the group hierarchy of consumer products searches. This type can contain data for the hierarchy ID and the description.
- `ConsumerProductGroupHierarchyTDMyElementsResponse`
Returns the hierarchy data, which is based on the search criteria mentioned in the inbound message.

Notes on SAP Implementation

- The generated proxy in Demand Data Foundation (DDF) is the `/DMF/CL_PMR_CPGHTDM001QR` ABAP class. The proxy data type is used in DDF for the `/DMF/PMR_CPGH_ELEMENTS_QUERY` incoming query message and the `/DMF/PMR_CPGH_ELEMENTS_RESP` outgoing response.
- DDF uses the Service Mapping Tool (SMT) for the inbound message mapping (`/DMF/CL_CPGH_QRY_RESP_SMT` *Mapping* field). No other Customizing settings are required.
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.

Enhancements

The `/DMF/SE_PMR_CPGHTDM001QR` Business Add-In (BAI) is available for this operation. The BAI contains the `/DMF/IF_SE_PMR_CPGHTDM001QR` interface with the `INBOUND_PROCESSING` and `OUTBOUND_PROCESSING` methods.

The `INBOUND_PROCESSING` method is called during the inbound data mapping and can be used in the following cases:

- To overwrite the existing mapping.
- To map additional data if new elements were added to the message.

The `/DMF/CO_CPGH_ELMNTS_QUERY_MSG` internal communication structure is used as the importing parameter of this method.

The `OUTBOUND_PROCESSING` method is called during the outbound data mapping and can be used in the following cases:

- To overwrite the existing mapping.
- To map additional data if new elements were added to the message.

The `/DMF/FND_CPGH_ELEM_RESP` internal communication structure is used as importing parameter of this method.

The Service Mapping Tool (SMT) allows you to enhance the inbound and outbound mapping. To enhance the mapping, you must select the `/DMF/CL_CPGH_QRY_RESP_SMT` application as the entry point.

More Information

The following nodes and elements do not contain any values in the `ConsumerProductGroupHierarchyTDMBByElementsResponse_sync` response message, as data is not available in the back-end system:

- `Consumer Product Group Hierarchy Level`
 - `SalesOrganisationID`
 - `SystemAdministrativeData`
 - `DistributionChannelCode`
 - `LifeCycleStatusCode`
 - `LifeCycleStatusName`
 - `ProductMultipleAssignmentAllowedIndicator`
 - `TimeDependencyIndicator`
- `Consumer Product Group Level`
 - `ConsumerProductGroup`
 - `HierarchyLevelOrdinalNumberValue`

The supplementary components of the `ConsumerProductGroupHierarchyTDMBByElementsQuery_sync` inbound message are not relevant for the implementation of operations.

6.4.2.1.2 Query Consumer Product Group Hierarchy In

Definition

An interface to search for consumer product group hierarchies.

Technical Data

Entity Type	Service Interface
Category	A2X
Direction	Inbound

Business Context and Use

The [Query Consumer Product Group Hierarchy In](#) service interface contains an operation that allows an application to request the data associated with one or more group hierarchies of consumer product.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ▾. For more information, see the Customizing activity documentation (transaction **SPRO**).

6.4.2.1.2.1 Replicate Consumer Product Group Hierarchy

Definition

To replicate the product group hierarchy data.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	ConsumerProductGroupHierarchyReplicationRequest_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Replicate Consumer Product Group* service operation is used to replicate the product group information.

Features

This operation creates, updates, and deletes the data. The operation contains the following main elements:

- ID
Group hierarchy ID of the consumer product
- Consumer product group
 - ID
Product group ID
 - Name
 - Hierarchy relationship
 - Description
Description of the product category ID
- Description
Description of the group hierarchy of consumer products

Message Types

- `Consumer Product Group Hierarchy Replication Request`

Error Handling

The *Replicate Consumer Product Group* service operation supports the Forward Error Handling (FEH) concept.

Notes on SAP Implementation

- The Interface Workbench receives all data coming through an XML message. The relevant tables for this process component are as follows:
 - `/DMF/MDIF_PROH`
 - `/DMF/MDIF_PROHN`
 - `/DMF/MDIF_PROHNT`
 - `/DMF/MDIF_PROHTX`
- The generated proxy in Demand Data Foundation (DDF) is the `/DMF/CL_PMR_CPGHRPLCTRQ` ABAP class. The proxy data type is used in DDF for the `/DMF/FND_CPGH_RPLCTN_REQ` incoming bulk replication message.

- DDF uses the Service Mapping Tool (SMT) for the inbound message mapping (/DMF/CL_CNSMR_PROD_GROUP_SMT *Mapping* field).

Enhancements

The DMF/SE_PMR_CPGHRPLCTRQ Business Add-In (BAI) is available for this operation. The BAI contains the /DMF/IF_SE_PMR_CPGHRPLCTRQ interface with the INBOUND_PROCESSING method.

The method is called during the inbound data mapping and can be used in the following cases:

- To overwrite the existing mapping.
- To map additional data.

The /DMF/CO_CPGH_RPLCTN_CPGH_MDT internal communication structure is used as the importing parameter for this method.

More Information

The *Replicate Consumer Product Group Hierarchy* service operation processes the *Consumer Product Group Hierarchy Replication* request message, which is structured as follows:

- Message Header (BusinessDocumentMessageHeader data type). Note that DDF only supports the processing of data from the following elements of the message header node: CreationDateTime and SenderBusinessSystemID.
- ConsumerProductGroupHierarchy

The following nodes and their corresponding elements are not relevant:

- DistributionChannelCode
- LifeCycleStatusCode
- TimeDependencyIndicator
- ProductMultipleAssignmentAllowedIndicator
- ConsumerProductGroup
 - CategoryManagementCategoryIndicator
 - HierarchyLevelOrdinalNumberValue
 - HierarchyRelationship (ValidityPeriod)
- Level
 - Description

Supplementary components in the *Replicate Consumer Product Group Hierarchy* operation are not relevant for implementing this service.

6.4.3 Business Partner Data Management

Definition

Enables a company to manage the business partner data that is relevant to control business processes, such as sales, purchasing, and accounting.

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	BusinessPartnerDataManagement
Namespace	http://sap.com/xi/ESM/ERP

Business Context and Use

The *Business Partner Data Management* process component is used to identify the supplier.

6.4.3.1 Supplier

Definition

A business partner that provides products or services.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	Supplier
Object Category	Master Data Object

Business Context and Use

The `Supplier` business object provides the supplier information.

6.4.3.1.1 Supplier Replication In

Definition

An interface to receive the supplier data.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Supplier Replication In* inbound interface contains an operation that receives the supplier (also known as vendor) master data. The vendor data can be used when creating vendor funds.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under **► Cross-Application Components ► Demand Data Foundation ► Basic Settings ► Define Logical Systems** **⌵**. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> **► <Version> ► Application Help ► SAP Customer Activity Repository ► Demand Data Foundation ► Integration Information ► Inbound Processing** **⌵**.

6.4.3.1.1.1 Replicate Supplier as Bulk V1

Definition

To replicate the supplier data.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	SupplierReplicateBulkRequest_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Replicate Supplier as Bulk V1* service operation is used to receive the supplier (also known as vendor) master data.

Features

The inbound operation creates, updates, and deletes the vendor data.

The operation includes the following main nodes:

- External Location Identifier
- Sending System Identifier

- Time Zone
- Address Data

Message Types

- `SupplierReplicateBulkRequest_V1`

Error Handling

The *Replicate Supplier as Bulk V1* operation supports Forward Error Handling (FEH).

Notes on SAP Implementation

- The vendor is defined in the location master data using the *Location Type Code* field with entry **1011**.
- The Interface Workbench receives all data coming through an Extensible Markup Language (XML) message. The relevant tables for this process component are as follows: `/dmf/mdif_loc`, `/dmf/mdif_loctxt`, `/dmf/mdif_locadr`, and `/dmf/mdif_locass`.
- The generated proxy in Demand Data Foundation (DDF) is the `/DMF/CL_FND_SPLRRPLCTBLK` ABAP class. The proxy data type is used in DDF for the `/DMF/FND_SPLR_RPLCT_BLK_RQ` incoming bulk replication message.
- The Service Implementation Workbench (SIW) is used to implement the service back-end system. The SIW uses the `/DMF/II_FND_SPLRRPLCTBLK` project ID configuration name and the `/DMF/CL_FND_SPLRRPLCTBLK_SI` generated service implementation class.
- DDF uses the Service Mapping Tool (SMT) for the inbound message mapping (`/DMF/CL_SUPPLIER_SMT Mapping` field).

Enhancements

The `/DMF/SE_FND_SPLRRPLCTBLK` Business Add-In (BAI) is available for this operation. The BAI is used to enhance the inbound message, and it is defined as an external customer BAI. A default implementation is not delivered.

6.4.3.1.2 Query Supplier In

Definition

An interface to search for suppliers.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Query Supplier In* service interface contains an operation that allows an application to request the supplier data.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ►. For more information, see the Customizing activity documentation (transaction **SPRO**).

6.4.3.1.2.1 Find Supplier by Elements

Definition

To find a supplier by elements.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDE

Release State	Released
Technical Name	SupplierTDByElementsQueryResponse_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Synchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Find Supplier by Elements* service operation is used when a business application requires the supplier information.

Features

Message Types

- `SupplierTDByElementsQuery_sync`
- `SupplierTDByElementsResponse_sync`

6.4.4 Demand Forecast Processing

Definition

Receives, processes, and releases demand forecasts.

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	DemandForecastProcessing
Namespace	http://sap.com/xi/ESM/ERP

Business Context and Use

The *Demand Forecast Processing* process component allows an external application to request forecast information.

6.4.4.1 Demand Forecast

Definition

A demand predicted for a particular product, in a particular location, for a given scenario, for a specific time period in the future.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	DemandForecast
Object Category	Business Process Object

Business Context and Use

The *Demand Forecast* business object provides the interface that collects and stores additional forecasts.

6.4.4.1.1 Manage Demand Forecast In

Definition

An interface to manage the demand forecast.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Manage Demand Forecast In* inbound interface contains an operation that provides the demand forecast to an external application.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ▾. For more information, see the Customizing activity documentation (transaction **SPRO**).

6.4.4.1.1.1 Read Demand Forecast

Definition

To read the demand forecast data by ID.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	DemandForecastTDByIDQueryResponse_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Read Demand Forecast* service operation is used to provide the demand forecast data to an external system, which requests the forecast for use in other processes.

Features

The inbound operation provides the demand forecast data.

Message Types

- `DemandForecastTDByIDQuery_sync`
Receives data for the demand forecast search.
This type can contain data for the following: Time Bucket Size Code, Forecast Period, Material ID, Location ID, Retail Incentive Offer ID.
- `DemandForecastTDByIDResponse_sync`
Returns the demand forecast data, which is based on the search criteria from the inbound message. At least one input parameter is required in the query. The result is returned based on the AND operation over all inputs provided.
- `StandardMessageFault`

Notes on SAP Implementation

- The generated proxy in the Demand Data Foundation (DDF) back-end system is the `/DMF/CO_FND_DMNDFCSTRPLCTBLK` ABAP class. The proxy data type is used in the DDF back-end system for the `/DMF/FND_DMND_FCST_RPLCTN_BLK` bulk replication message.
- The method calls are as follows:
 - `/dmf/cl_dmnd_fcst_assist=>mapping_inbound_qr`
 - `/dmf/cl_dmnd_fcst_assist=>read_dmnd_fcst`
 - `/dmf/cl_dmnd_fcst_assist=>mapping_outbound_qr`
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.

Enhancements

The Business Add-In (BAI) in the `/DMF/SE_SPOT_DMNDFCST` enhancement spot is available for this operation. The BAI is used to enhance the inbound and outbound messages, and it is defined as an external customer BAI. A default implementation is not provided.

6.4.4.1.2 Demand Forecast Replication Out

Definition

An interface to replicate demand forecasts.

Technical Data

Entity Type	Service Interface
Category	Third-Party A2A
Direction	Outbound

Business Context and Use

The *Demand Forecast Replication Out* service interface contains an operation that provides the forecast data requested by external applications to support reporting or planning activities.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ▾. For more information, see the Customizing activity documentation (transaction **SPRO**).
- The default modeling and forecasting models must be defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Modeling and Forecasting* ▾.
- The generated proxy in DDF is the `/DMF/CO_FND_DMNDFCSTRPLCTBLK` ABAP class. If you have an application-to-application (A2A) communication, the proxy class can be called directly to execute the service.

6.4.4.1.2.1 Request Demand Forecast Replication as Bulk

Definition

To replicate demand forecasts.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	DemandForecastReplicationBulkRequest_Out
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	Third-party A2A
Direction	Outbound
Mode	Asynchronous
Idempotency	Not applicable

Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Request Demand Forecast Replication as Bulk* service operation is used to allow an external application to request the forecast data.

Features

The information nodes are as follows:

- DemandForecast
- DemandPlanningTimeSeriesItem
- ProcessedTimeSeriesItem

Message Types

- Demand Forecast Replication Bulk Request

Notes on SAP Implementation

The generated proxy in Demand Data Foundation (DDF) is the `/DMF/CO_FND_DMNDFCSTRPLCTBLK` ABAP class. The proxy data type is used in DDF for the `/DMF/FND_DMND_FCST_RPLCTN_BLK` bulk replication message.

6.4.5 Demand Planning Time Series Processing

Definition

Contains the time series information that is relevant for calculating the demand forecast.

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	DemandPlanningTimeSeriesProcessing
Namespace	http://sap.com/xi/ESM/ERP

Business Context and Use

The *Demand Planning Time Series Processing* process component contains the time series information, which can be used in the demand modeling process.

6.4.5.1 Demand Planning Time Series

Definition

A time series is a set of data that is distributed over time, such as demand data in monthly time period occurrences.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	DemandPlanningTimeSeries
Object Category	Business Process Object

Business Context and Use

The *Demand Planning Time Series* business object provides an alternative set of time series information. It can represent the sales history or any other set of data that requires information by date.

6.4.5.1.1 Demand Planning Time Series Notification In

Definition

An interface to notify of a demand planning time series.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Demand Planning Time Series Notification In* inbound interface contains an operation that provides time series data, such as forecasts or sales histories.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ►. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> ► *<Version>* ► *Application Help* ► *SAP Customer Activity Repository* ► *Demand Data Foundation* ► *Integration Information* ► *Inbound Processing* ►.

6.4.5.1.1.1 Maintain Demand Planning Times Series based on Times Series Bulk Notification

Definition

To replicate the time series data.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	DemandPlanningTimeSeriesBulkNotification_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Maintain Demand Planning Times Series based on Times Series Bulk Notification* service operation is used to receive the time series data.

Features

The inbound operation creates, updates, and deletes the data.

The main nodes for the sales data are as follows:

- External Location Identifier
- External Product Identifier
- Offer Identifier
- Sending System Identifier
- Sales Quantity
For actual sales, this is a positive number (mandatory). For returns, this is a negative number.
- Sales Quantity Unit of Measure
Specifies the selling unit of measure (UoM) of the supplied quantity.
- Validity Time and Granularity
Specifies the time granularity of the sales data. This granularity can be either **D** (daily) or **W** (weekly).
- Sales Price excluding Tax
Specifies the monetary value of the sale without tax.
- Sales Price including Tax
Specifies the monetary value of the sale with tax.
- Transaction Count
Specifies the number of transactions for a given time.
- Squared Unit Count
Specifies the square of the summation of units.
- Cubic Unit Count
Specifies the cube of the sum of units.

The main nodes for the store traffic data are as follows:

- External Location Identifier
- Sending System Identifier
- Date
Contains the date for the *Count* element.
- Count
Defines the number of transactions that had a sales quantity different from zero.

The main nodes for the generic data (consumption data) are as follows:

- External Location Identifier
- External Product Identifier
- Sending System Identifier
- Key Figure Parameter
Describes the generic time series (such as consumption versus goods issued).
- Quantity
The sales quantity can only be a positive number.
- Quantity Unit of Measure
The unit of measure for the supplied quantity.
- Validity Time and Granularity

Message Types

- Demand Planning Time Series Bulk Notification

Error Handling

The *Maintain Demand Planning Times Series based on Times Series Bulk Notification* operation supports the Forward Error Handling (FEH) concept.

Notes on SAP Implementation

Demand Data Foundation (DDF) can receive the following time series data:

- Sales
- Store traffic
- Generic (consumption)

The Interface Workbench receives all data coming through an Extensible Markup Language (XML) message. The `/DMF/TS_GENERIC` table is relevant for this process.

Enhancements

The `/DMF/SE_SORT_FND_DMPLTSBLKNO` Business Add-In (BAI) is available for this operation. A default implementation is not provided.

6.4.5.1.2 Query Demand Planning Time Series In

Definition

An interface to search demand planning time series.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Query Demand Planning Time Series In* inbound interface contains an operation that allows an external application to request the time series data.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ▾. For more information, see the Customizing activity documentation (transaction **SPRO**).

6.4.5.1.2.1 Find Demand Planning Times Series by Elements

Definition

To find demand planning time series by elements.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	DemandPlanningTimeSeriesTDMByElementsQueryResponse_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Synchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Find Demand Planning Times Series by Elements* service operation is used to request the time series data for supporting standard business processes.

In support of various planning or business purposes, an external application can request any time based data, such as the sales history or the forecast data.

For example, a merchandise planner creates the following year's revenue goals. The planning application can retrieve both the future forecast for a specific time period and the sales history to better understand the previous period's performance.

Features

Message Types

- `DemandPlanningTimeSeriesTDMByElementsQuery_sync`
Receives data for the demand planning time series search. This type can contain data for the following: Time Bucket Size Code, Validity Period, Material ID, Location ID, Retail Incentive Offer ID, Type Code.
- `DemandPlanningTimeSeriesTDMByElementsResponse_sync`
Returns the following data types, which is based on the search criteria mentioned in the inbound message: Consumption Time Series, POS Time Series, Store Traffic Time Series. At least one input parameter must be provided for the query. The output is based on the AND operation over all input parameters provided.
- `StandardMessageFault`

Notes on SAP Implementation

- Mapping is performed using the Service Mapping Tool (SMT) and no other Customizing settings are required.
- The method calls are as follows:
 - `/dmf/cl_dmpl_ts_assist=>mapping_inbound_qr`
 - `/dmf/cl_dmpl_ts_assist=>read_ext_time_series`
 - `/dmf/cl_dmpl_ts_assist=>mapping_outbound_qr`
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.

6.4.6 Inventory Processing

Definition

Manages the tasks required to record inventory changes and the associated activities.

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	InventoryProcessing
Namespace	http://sap.com/xi/ESM/ERP

Business Context and Use

The *Inventory Processing* process component enables inventory information.

6.4.6.1 Inventory

Definition

A quantity of all materials in a location, including the material reservations at this location.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	Inventory
Object Category	Business Process Object

Business Context and Use

The *Inventory* business object provides the inventory information.

6.4.6.1.1 Inventory Replication In

Definition

An interface to receive the inventory data.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Inventory Replication In* service interface contains an operation that receives the inventory data.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ►. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> ► *<Version>* ► *Application Help* ► *SAP Customer Activity Repository* ► *Demand Data Foundation* ► *Integration Information* ► *Inbound Processing* ►.
- The generated proxy in Demand Data Foundation (DDF) is the `/DMF/CL_FND_INVRPLCTBLKRQ` ABAP class. If you have an A2A communication, the proxy class can be called directly to execute the service.

6.4.6.1.1.1 Inventory Replication

Definition

To replicate the inventory data.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	InventoryTDMReplicationBulkRequest_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The [Replicate Inventory as Bulk](#) service operation is used to replicate the inventory data, such as the amount of inventory by location.

Features

The inbound operation creates and updates the inventory data.

The operation includes the following main elements:

- External Location Identifier
- External Product Identifier

- Sending System Identifier
Defines the logical system.
- Stock Type
Defines the use of a certain stock quantity. Only free available stock is accepted.
- Inventory Direction Movement Code
Defines whether goods have been issued or received.
- Stock Quantity
Represents the stock quantity, which can be a positive number or 0 (zero).
- Stock Quantity Unit of Measure
Represents the unit of measure (UoM) for the supplied quantity.
- Validity Date
Represents the date when the stock has been calculated by the central stock management system.

Message Types

- `Inventory TDM Replication Bulk Request`

Error Handling

The [Replicate Inventory as Bulk](#) operation supports the Forward Error Handling (FEH) concept.

Constraints

The following nodes and elements of the message type are not relevant:

Inventory

- `InventoryManagedLocationInternalID`

Item

- `InventorySpecialStockTypeCode`
- `SellerPartyInternalID`
- `ProductRecipientPartyInternalID`

Aggregation Overview (complete node is not relevant in the system)

- `MaterialInternalID`
- `Description`
- `InventoryUsabilityCode`
- `InventoryUsabilityName`
- `InventorySpecialStockTypeCode`
- `InventorySpecialStockTypeName`
- `Quantity`

Notes on SAP Implementation

- The generated proxy in DDF is the `/DMF/CL_FND_INVRPLCTBLKRQ` ABAP class. The proxy data type is used in DDF for the `/DMF/FND_INV_TDM_RPLCT_REQ` incoming bulk replication message.
- The Service Implementation Workbench (SIW) is used to implement the service back-end system. The SIW uses the `/DMF/II_FND_INVRPLCTBLKRQ` project ID configuration name and the `/DMF/CL_FND_INVRPLCTBLK_SI` generated service implementation class.
- DDF uses the Service Mapping Tool (SMT) for the inbound message mapping (`/DMF/CL_INV_RPLCTN_SMT` *Mapping* field).

Enhancements

The `/DMF/SE_FND_INVRPLCTBLK` Business Add-In (BAI) is available for this operation. The BAI contains the `/DMF/IF_SE_FND_INVRPLCTBLK` interface with the `INBOUND_PROCESSING` method.

The method is called during the inbound data mapping and can be used in the following cases:

- To overwrite the existing mapping.
- To map additional data if new elements were added to the message.

The `/DMF/CO_INV_RPLCTN_REQ_MSG_S` internal communication structure is used as the importing parameter for the method.

The Service Mapping Tool (SMT) allows you to enhance the inbound and outbound mapping. To enhance the mapping, you must select the `/DMF/CL_INV_RPLCTN_SMT` application as the entry point.

6.4.7 Location Data Management

Definition

Manages the master data required for physical locations. This management includes objects that depend on the location or group of locations.

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	LocationDataManagement
Namespace	<code>http://sap.com/xi/ESM/ERP</code>

Business Context and Use

The *Location Data Management* process component enables the location hierarchy information.

6.4.7.1 Location Group Hierarchy

Definition

A hierarchical arrangement of locations based on business aspects.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	LocationGroupHierarchy
Object Category	Master Data Object

Business Context and Use

The *Location Group Hierarchy* business object provides the location hierarchy information.

6.4.7.1.1 Location Group Hierarchy Replication In

Definition

An interface to receive the location group hierarchy.

Technical Data

Entity Type	Service Interface
-------------	-------------------

Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Location Group Hierarchy Replication In* service interface contains an operation that receives the location group hierarchy.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ►. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> ► *<Version>* ► *Application Help* ► *SAP Customer Activity Repository* ► *Demand Data Foundation* ► *Integration Information* ► *Inbound Processing* ►.
- Mapping is performed using the Service Mapping Tool (SMT) and no other Customizing settings are required.
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.

6.4.7.1.1.1 Replicate Location Group Hierarchy as Bulk

Definition

To replicate location group hierarchies.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	LocationGroupHierarchyReplicationBulkRequest_ In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Replicate Location Group Hierarchy as Bulk* service operation is used to replicate the location group and the location hierarchy.

Features

Message Types

- LocationGroupHierarchyReplicationBulkRequest

6.4.7.2 Location

Definition

A geographical place.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	Location
Object Category	Master Data Object

Business Context and Use

The *Location* business object provides the location information.

6.4.7.2.1 Query Location Group Hierarchy In

Definition

An interface to search for location group hierarchies.

Technical Data

Entity Type	Service Interface
Category	A2X
Direction	Inbound

Business Context and Use

The *Query Location Group Hierarchy In* service interface contains an operation that searches for location group hierarchies.

The operations contained in the *Location Data Management* process component are suitable for use in the retail and consumer products industries.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ▾. For more information, see the Customizing activity documentation (transaction **SPRO**).
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.

6.4.7.2.1.1 Find Location Group Hierarchy by Element

Definition

To find a location group hierarchy by element.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	LocationGroupHierarchyTDMByElementsQueryResponse_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	A2X
Direction	Inbound
Mode	Synchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1

Business Context and Use

The *Find Location Group Hierarchy by Element* service operation is used to search for location group hierarchies by elements.

Features

Message Types

- `LocationGroupHierarchyTDMByElementsQuery_sync`
Receives data for the location hierarchy search. This type can contain data for the hierarchy ID and the description.
- `LocationGroupHierarchyTDMByElementsResponse_sync`
Returns the hierarchy data, which is based on the search criteria from the inbound message. At least one input parameter (hierarchy ID or description) must be provided for the query. The output is based on the AND operation for all input parameters provided.
- `StandardMessageFault`

Notes on SAP Implementation

- The generated proxy in Demand Data Foundation (DDF) is the `/DMF/CL_FND_LOCGRPHR001QR` ABAP class. The proxy data type is used in DDF for the `/DMF/FND_LOC_HR_TDM_ELEM_QRY` incoming query message and the `/DMF/FND_LOC_HR_TDM_ELEM_RES` outgoing response message.
- DDF uses the Service Mapping Tool (SMT) for the inbound message mapping (`/DMF/CL_LOC_HIER_SMT Mapping` field).
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.

Enhancements

The `/DMF/SE_FND_LOCGRPHR001` Business Add-In (BAI) is available for this operation. The BAI contains the `/DMF/IF_SE_FND_LOCGRPHR001` interface with the `INBOUND_PROCESSING` and `OUTBOUND_PROCESSING` methods.

The `INBOUND_PROCESSING` method is called during the inbound data mapping and can be used in the following cases:

- To overwrite the existing mapping.
- To map additional data if new elements were added to the message.

The `/DMF/CO_LOC_GRP_HR_ELEMNT_QRY` internal communication structure is used as the importing parameter of this method.

The `OUTBOUND_PROCESSING` method is called during the outbound data mapping and can be used in the following cases:

- To overwrite the existing mapping.
- To map additional data if new elements were added to the message.

The `DMF/FND_LOC_HR_ELEM_RESP` internal communication structure is used as importing parameter of this method.

The Service Mapping Tool (SMT) allows you to enhance the inbound and outbound mapping. To enhance the mapping, you must select the `/DMF/CL_LOC_HIER_SMT` application as the entry point.

More Information

The following nodes and elements do not contain any values in the `LocationGroupHierarchyTDMyElementsResponse_sync` response message because the data is not available in the back-end system:

- `LocationGroupHierarchy` (validity period)
- `LocationGroup` (property)

Supplementary components of the `LocationGroupHierarchyTDMyElementsQuery_sync` inbound message are not relevant for the service implementation.

6.4.7.2.2 Query Location In

Definition

An interface to search for locations.

Technical Data

Entity Type	Service Interface
Category	A2X
Direction	Inbound

Business Context and Use

The `Location` service interface contains an operation that searches for locations.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ☒. For more information, see the Customizing activity documentation (transaction **SPRO**).

6.4.7.2.1 Find Location by Elements

Definition

To find a location by elements.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	LocationTDMyElementsQueryResponse_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	A2X
Direction	Inbound
Mode	Synchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Find Location by Elements* service operation is used to find a location by elements.

Features

Message Types

- `LocationTDMByElementsQuery_sync`
- `LocationTDMByElementsResponse_sync`

6.4.8 Merchandise Management

Definition

Provides a comprehensive merchandise view for a product, including bill of material, matrix of product and variants, sales price information, and purchase price information. Merchandise management allows a company to transmit this comprehensive view to systems that cannot manage single objects, for example, product and price. Furthermore, it allows a company to provide to external entities the read access to this comprehensive view.

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	MerchandiseManagement
Namespace	<code>http://sap.com/xi/ESM/TDM</code>

Business Context and Use

The *Merchandise Management* process component allows an external application to request the product information, such as the various units of measure (UoMs), language-dependent text, and hierarchy assignments.

6.4.8.1 Merchandise

Definition

A comprehensive merchandise view of a product, including the sales price information.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	Merchandise
Object Category	Transformed Object

Business Context and Use

The [Merchandise](#) business object contains the operations used to provide the product information.

6.4.8.1.1 Merchandise Replication In

Definition

An interface to receive the merchandise.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Merchandise Replication In* service interface contains an operation that receives the following:

- Product
- Product location combination

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under **► Cross-Application Components ► Demand Data Foundation ► Basic Settings ► Define Logical Systems ▾**. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> **► <Version> ► Application Help ► SAP Customer Activity Repository ► Demand Data Foundation ► Integration Information ► Inbound Processing ▾**.
- Mapping is performed using the Service Mapping Tool (SMT) and no other Customizing settings are required.

6.4.8.1.1.1 Replicate Merchandise Demand Management as Bulk

Definition

To replicate the relevant attributes of a merchandise.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF

Release State	Released
Technical Name	MerchandiseDemandManagementReplicationBulkRequest_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The [Replicate Merchandise Demand Management as Bulk](#) service operation is used to receive the following data:

- Product
- Product location combination, such as sales and pricing information

Features

The [Replicate Merchandise Demand Management as Bulk](#) service operation provides the product-related master data.

This service operation is used to replicate the mass import of product data, along with hierarchy assignments, supply planning process, and sales price information.

The nodes for the basic product information are as follows:

- `Common`
Contains the collection of general information about a product.
- `Description`
Contains the language-dependent description of the product.
- `GlobalTradeItemNumberQuantity`
Contains the dependent identification of the product following the European Article Numbering-Uniform Code Council system (EAN-UCC).
- `QuantityConversion`
Contains the conversion factors between different units of measure for the product.

- `QuantityCharacteristicConversion`
Contains the conversion factors between the process-relevant units of measure and the units of measure for the product.

The nodes for the hierarchy assignments are as follows:

- `ProductCategoryAssignment`
Contains the assignment of the product category to the product.
- `ConsumerProductGroupAssignment`
Contains the assignment of the product group to the product.

The nodes related to the supply planning process and the sales price information are as follows:

- `SupplyPlanningProcess`
Contains the definition of the usability of a material in the supply planning process for a specific supply planning area.
- `SalesPriceInformation`
Contains a valid sales price specification, which is based on a pricing procedure for a specific `PriceSpecificationElementTypeCode`.

The internal ID for the product is mandatory; all other nodes are optional.

Message Types

- `MerchandiseDemandManagementReplicationBulkRequest_In`

Error Handling

The *Replicate Merchandise Demand Management as Bulk* operation supports Forward Error Handling (FEH).

Constraints

The following Complete Transmission Indicator (CTI) features are not implemented in the back-end system:

- `consumerProductGroupAssignmentListCompleteTransmissionIndicator`
- `descriptionListCompleteTransmissionIndicator`
- `globalTradeItemNumberListCompleteTransmissionIndicator`
- `quantityConversionListCompleteTransmissionIndicator`
- `quantityCharacteristicListCompleteTransmissionIndicator`
- `supplyPlanningProcessListCompleteTransmissionIndicator`
- `salesPriceInformationListCompleteTransmissionIndicator`

The default entry for the CTI is `FALSE`.

If CTI is set to `TRUE` for any of the nodes in the input, the CTI uses the `/DMF/SE_FND_MRCHDSDMRPLCT_CTI` Business Add-In (BAI). This BAI offers the `/DMF/IF_FND_MRCHDSDMRPLCT_CTI` interface containing the `INBOUND_PROCESSINGP_CTI` method. This method can be used to implement the logic for CTI.

If the CTI is `TRUE` for the respective node, all database entries for that particular *Product Internal ID* element should be deleted and replaced with the input data. The `/DMF/FND_MRCHDS_RPLCTN` internal communication

structure is used as importing parameter of the `INBOUND_PROCESSING_CTI` method and can be used to implement the logic for the CTI handling of various nodes.

Notes on SAP Implementation

- The generated proxy in Demand Data Foundation (DDF) is the `/DMF/CL_FND_MRCHDSMRPLCTBLKRQ` ABAP class. DDF uses the proxy data type for the `/DMF/FND_MRCHDS_RPLCTN_BLKREQ` incoming bulk replication message.
- The Service Implementation Workbench (SIW) is used to implement the service back-end system. The SIW uses the `/DMF/II_FND_MRCHDSMRPLCTBLKRQ` project ID configuration name and the `/DMF/CL_FND_MRCHDSMRPL_SI` generated service implementation class.
- DDF uses the Service Mapping Tool (SMT) for the inbound message mapping (`/DMF/CL_FND_MRCHDSMRPLCTBLKRQ` *Mapping* field).

Enhancements

The `/DMF/SE_FND_MRCHDSMRPLCT` Business Add-In (BAI) is available for this operation. The BAI contains the `/DMF/IF_SE_PMR_CPGHTDM001QR` interface with the `INBOUND_PROCESSING` method.

The method is called during the inbound data mapping and can be used in the following cases:

- To overwrite the existing mapping.
- To map additional data.

The `DMF/CO_MRCHDS_RPLCTN_REQ_MSG` internal communication structure is used as the importing parameter for this method.

The Service Mapping Tool (SMT) allows you to enhance the inbound and outbound mapping. To enhance the mapping, you must select the `/DMF/CL_FND_MRCHDSMRPLCTBLKRQ` application as an entry point.

6.4.8.1.2 Query Merchandise In

Definition

An interface to search for merchandise.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Query Merchandise In* service interface groups operations that contain searches for merchandise.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ▾. For more information, see the Customizing activity documentation (transaction **SPRO**).
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.
- You have authorization to read the data in the following components in the back-end system:
 - Product
 - Product Text
 - Product Unit of Measure
 - Product Category
 - Product Category Hierarchy
 - Consumer Product Group
 - Consumer Product Group Hierarchy

6.4.8.1.2.1 Find Merchandise Material by Elements

Definition

To find a material by elements and return the material attributes that are valid globally at an organization.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDE

Release State	Released
Technical Name	MerchandiseTDMMaterialByElementsQueryResponse_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	A2X
Direction	Inbound
Mode	Synchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The [Find Merchandise Material by Elements](#) service operation is used to find a merchandise material by elements.

Features

Message Types

- `MerchandiseTDMMaterialByElementsQuery_sync`
Receives data for the material search. This type can contain data for the following:
 - Material
 - Product Category
 - Product Category Hierarchy
 - Consumer Product Group
 - Consumer Product Group Hierarchy
- `MerchandiseTDMMaterialByElementsResponse_sync`
Returns the following data based on the search criteria from the inbound message:
 - Material
 - Material Text
 - Material Unit of Measure
 - Product Category
 - Product Category Hierarchy
 - Consumer Product Group
 - Consumer Product Group Hierarchy

- StandardMessageFault

Notes on SAP Implementation

The method calls are as follows:

- /dmf/cl_material_assist=>mapping_inbound_001_qr
- /dmf/cl_material_assist=>read_mrchds_mat
- /dmf/cl_material_assist=>mapping_outbound_001_qr

Enhancements

The /DMF/SE_FND_MRCHNDSTDM001 Business Add-In (BAI) is available for this operation. The BAI is used to enhance the inbound and outbound messages, and it is defined as an external customer BAI. A default implementation is not delivered.

More Information

Supplementary components are not relevant for the *Find Merchandise Material by Elements* operation.

The following nodes are not relevant in the back-end system. Although they are present in the global definition of the message interface, they are deleted from the local interface:

- Text Collection
- Attachment Folder
- Matrix Material Property
- Matrix Material Assignment
- Property Valuation

6.4.8.1.2.2 Find Merchandise Supply Planning and Price by Elements

Definition

To read the product location combination and the pricing data.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released

Technical Name	MerchandiseTDMSupplyPlanningAndPriceByElementsQueryResponse_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	A2X
Direction	Inbound
Mode	Synchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Find Merchandise Supply Planning and Price by Elements* service operation is used to read the product location combination and the pricing data.

Features

Message Types

- `MerchandiseTDMSupplyPlanningAndPriceByElementsQuery_sync`
 Receives data for the material search. This type can contain data for the following parameters:
 - Material ID
 - Material Description
 - Material GTIN
 - Material Merchandise Type Code
 - Material Merchandise Type Name
 - Product Category ID
 - Product Category Description
 - Consumer Product Group ID
 - Consumer Product Group Description
 - Supply Planning Area ID
 - Supply Planning Area Description
- `MerchandiseTDMSupplyPlanningAndPriceByElementsResponse_sync`
 Returns information for the material, the supply planning process, and the sales price information based on the search criteria from the inbound message. At least one of the following parameters must be provided:
 - Material ID

- Material Description
- Material GTIN
- Material Merchandise Type Code
- Material Merchandise Type Name
- Product Category ID
- Product Category Description
- Consumer Product Group ID
- Consumer Product Group Description
- Supply Planning Area ID
- Supply Planning Area Description

The output is returned based on the `AND` operation over all input parameters provided.

Notes on SAP Implementation

- The generated proxy in Demand Data Foundation (DDF) is the `/DMF/CL_FND_MRCHNDSTDM002QR` ABAP class. The proxy data type is used in DDF for the `/DMF/FND_MRCHNDS_SUPPLNPRC_QRY` request message and for the `/DMF/FND_MRCHNDS_SUPPLNPRC_RSP` response message.
- The Service Implementation Workbench (SIW) is used to implement the service back-end system. The SIW uses the `/DMF/II_FND_MRCHNDSTDM002QR` project ID configuration name and the `/DMF/CL_FND_MRCHNDSTDM002QR_SI` generated service implementation class
- DDF uses the Service Mapping Tool (SMT) for the inbound message mapping (`/DMF/CL_MRCHNDS_SUP_PLN_QR_SMT` *Mapping* field).
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.
- The method calls are as follows:
 - `/dmf/cl_material_assist=>mapping_inbound_002_qr`
 - `/dmf/cl_material_assist=>read_mrchds_price`
 - `/dmf/cl_material_assist=>mapping_outbound_002_qr`

Enhancements

The `/DMF/SE_FND_MRCHNDSTDM002` Business Add-In (BAI) is available for this operation. The BAI is used to enhance the inbound and outbound messages, and it is defined as an external customer BAI. A default implementation is not delivered.

More Information

Supplementary components are not relevant for the *Find Merchandise Supply Planning and Price by Elements* operation.

6.4.9 Retail Offer Management

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	RetailOfferManagement
Namespace	http://sap.com/xi/ESM/TDM

6.4.10 Organizational Management

Definition

Contains the provision of a central and a unified organizational structure of the enterprise and its collaborative partners.

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	OrganisationalManagement
Namespace	http://sap.com/xi/ESM/ERP

Business Context and Use

The [Organizational Management](#) process component contains organizational information.

6.4.10.1 Functional Unit

Definition

An organizational center.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	FunctionalUnit
Object Category	Master Data Object

Business Context and Use

The *Functional Unit* business object provides the organizational center responsible for the planning, execution, and administration of business process steps.

6.4.10.1.1 Functional Unit Replication In

Definition

An interface to receive the functional unit data.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Functional Unit Replication In* service interface contains an operation that receives the functional unit data.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► [Cross-Application Components](#) ► [Demand Data Foundation](#) ► [Basic Settings](#) ► [Define Logical Systems](#) ►. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> ► [<Version>](#) ► [Application Help](#) ► [SAP Customer Activity Repository](#) ► [Demand Data Foundation](#) ► [Integration Information](#) ► [Inbound Processing](#) ►.

6.4.10.1.1 Replicate Functional Unit ERP Supply Chain as Bulk

Definition

To replicate the functional unit data of the supply chain view.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	FunctionalUnitERPSupplyChainReplicationBulkRequest_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Asynchronous

Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Replicate Functional Unit ERP Supply Chain as Bulk* service operation is used to replicate the functional unit of the supply chain data.

Features

The inbound operation replicates the functional unit.

Message Types

- Functional Unit ERP Supply Chain Replication Bulk Request

6.4.11 Point of Sale Transaction Processing

Definition

Point of Sale Transaction Processing enables a company to receive, process and analyze point of sale data. It includes aggregation and forwarding capabilities.

Technical Data

Software Component	RTLPOSDM
Technical Name	PointOfSaleTransactionProcessing
Namespace	http://sap.com/xi/RTLPOSDM

Business Context and Use

This process component enables you to send retail, financial, and goods movement transactions that are performed in a retail store to SAP Customer Activity Repository. Once in SAP Customer Activity Repository, transactions can be analyzed, aggregated and forwarded to subsequent processes.

Notes on SAP Implementation

To use the `Point of Sale Transaction Processing` process component:

- SAP Customer Activity Repository must be configured for use according to the business requirements of the customer
- You must be using the `CA-RT-CAR-PIP` application component

More Information

[Point Of Sale Transaction \[page 397\]](#)

6.4.11.1 Point of Sale Transaction

Definition

A `Point Of Sale Transaction` is a business activity that is performed in a retail store, usually at the point of sale.

A point of sale transaction can refer to any of the following:

- retail transaction
- financial transaction
- inventory movement transaction
- control transaction
- summary transaction

Technical Data

Software Component	<code>RTLPOSDM</code>
Technical Name	<code>PointOfSaleTransaction</code>

Business Context and Use

This business object enables you to send retail, financial, and goods movement transactions that are performed in a retail store to SAP Customer Activity Repository. Once in SAP Customer Activity Repository, transactions can be analyzed, aggregated and forwarded to subsequent processes.

Constraints and Integrity Conditions

Currently, inventory transactions and summary transactions are not supported in the service operations.

Notes on SAP Implementation

To use the `Point of Sale Transaction` business object:

- SAP Customer Activity Repository must be configured for use according to a customer's business requirements
- You must be using the `CA-RT-CAR-PIP` application component

More Information

[Point Of Sale Transaction In \[page 398\]](#)

[Point Of Sale Transaction Out \[page 402\]](#)

6.4.11.1.1 Point Of Sale Transaction In

Definition

An asynchronous inbound service interface to create point of sale transactions.

Technical Data

Category:	SAP A2A
Direction	inbound

Business Context and Use

The `Point Of Sale Transaction In` inbound service interface contains a bulk operation that can be used to create many point of sale transactions in SAP Customer Activity Repository with a single service call.

Point of sale transactions are transferred from the POS to the process component [Point Of Sale Transaction Processing \[page 396\]](#) for further processing such as analysis, aggregation and forwarding to subsequent processes.

Constraints and Integrity Conditions

The `Point Of Sale Transaction In` inbound service interface does not support the creation of inventory or summary transactions.

Notes on SAP Implementation

To use the `Point Of Sale Transaction In` service interface:

- SAP Customer Activity Repository must be configured for use according to the business requirements of the customer
- You must be using the `CA-RT-CAR-PIP` application component

More Information

[Create Point Of Sale Transaction as Bulk \[page 399\]](#)

6.4.11.1.1 Create Point of Sale Transaction as Bulk

Definition

To create point of sale transactions in bulk.

Technical Data

Software Component	RTLPOSDM
Release State	released
Technical Name	PointOfSaleTransactionERPBulkCreateRequest_In
Namespace	http://sap.com/xi/RTLPOSDM/Global2
Application Component	CA-RT-CAR-PIP
Related Web Service Definition	POSTrxERPBulkCRTRQ
Category	SAP A2A
Direction	inbound
Mode	asynchronous
Idempotency	not applicable
Change/Update Behavior	not applicable
P2P Communication Enabled	yes

Notes on Release State (Technical Data)

This operation is the successor to operation of the same name under namespace `http://sap.com/xi/BICONTENT/Global2`.

Business Context

The operation is used to create POS transactions that have been sent from a POS system in the retail sector to SAP Customer Activity Repository in bulk. This operation supports encryption of credit card data and credit-card-related data.

The corresponding outbound service of this operation resides in third-party component.

Features

The `Create Point of Sale Transaction as Bulk` inbound operation is available to create POS transactions that have been sent from a POS system to SAP Customer Activity Repository. The `Create`

`Point of Sale Transaction as Bulk` is a bulk operation that can contain multiple POS transactions within a single message. It is also possible to mix different transaction types within a single message.

The implementation of this inbound operation allows posting of the following transaction types:

- Retail transactions, for example, sales, return, payment on account
- Financial transactions, for example, deposit, paid in, tender adjustment
- Control transactions, for example, cashier sign-on, close register, open store

Per single transaction, credit card data and credit-card-related data can be transferred in a single encrypted data segment.

The implementation of the inbound service is completely embedded in the existing SAP Customer Activity Repository infrastructure and environment and uses the API `/POSDW/CREATE_TRANSACTIONS_INT`, which is also called in RFC, BAPI, and IDoc processing. Therefore, the structure of the service operation is mapped to the importing parameter of table type `/POSDW/TT_TRANSACTION_INT`.

The business object [Point Of Sale Transaction \[page 397\]](#) is sent as input and describes a business activity as performed in a retail store (including retail transactions, financial movements, and goods movement).

Prerequisites

SAP Customer Activity Repository must be configured for use according to the business requirements of the customer (the implementation of this inbound service is embedded in the environment of SAP Customer Activity Repository). The Customizing settings required are the same as for other possible inbound interfaces and techniques such as IDoc, BAPI, or RFC.

Integration

There exists a mirrored test operation `PointOfSaleTransactionERPBulkCreateRequest_Out` under namespace `http://sap.com/xi/RTLPOSDM/Global2/Testing`.

Error Handling

Forward error handling (FEH) is not available.

As a result, any message that cannot get processed within the service implementation (for example, due to a mapping error) is rejected and a corresponding fault message is raised using `cl_proxy_fault=>raise`.

Constraints and Integrity Conditions

The operation cannot currently import inventory or summary transactions. This is currently only possible using IDoc, BAPI, and RFC interfaces.

Notes on SAP Implementation

Processing

The `Create Point of Sale Transaction as Bulk` operation is an alternative method of transferring POS transactions to SAP Customer Activity Repository. As a result, the following apply:

- Depending on the SAP Customer Activity Repository Customizing settings (transaction `/POSDW/IMG`) for the store sending the data, you can post the incoming data immediately or to use the SAP Customer Activity Repository inbound queue (transactions `/POSDW/QMON` and `/POSDW/QDIS`) to post the data in a separate processing unit or step.
If the SAP Customer Activity Repository inbound queue is used, the XML messages of the service can be identified in the queue monitor in the following fields:
 - Key: Carries the GUID of the message instance
 - Object Type: Displays `XML_DOC`
- Successfully processed POS transactions transferred using the `Create Point Of Sale Transaction as Bulk` operation can be monitored in the POS Workbench (transaction `/POSDW/MONO`). In the POS Workbench, it is not possible to identify which method was used to import the transactions into SAP Customer Activity Repository (that is, operation, IDoc, RFC, or BAPI).

Configuration

Values of codelists of GDTs are mapped to corresponding values of SAP Customer Activity Repository Customizing (criteria values of type 1 and type 2) to determine the PIPE category code. These Customizing settings are found under: [▶ SAP Customer Activity Repository ▶ POS Data Management ▶ POS Inbound Processing ▶ Integration with Other SAP Components ▶ SAP POS ▶ Definition of Values for Category Code Criteria ▶](#).

Enhancements

The `/POSDW/SE_POS_TRANSACTION_INBOUND` Business Add-In (BAI) is available for this operation under Enhancement Spot `/POSDW/SPOT_SE_POS_TRANSACTION`.

6.4.11.1.2 Point Of Sale Transaction Out

Definition

An asynchronous outbound service interface to confirm the creation of point of sale transactions in SAP Customer Activity Repository.

Technical Data

Category

SAP A2A

Direction

outbound

Business Context and Use

The is outbound service interface groups operations that send out confirmations of the creation of point of sale transactions in SAP Customer Activity Repository.

Constraints and Integrity Conditions

The `Point Of Sale Transaction Out` outbound service interface does not support the confirmation of creation of inventory or summary transactions.

Notes on SAP Implementation

To use the `Point Of Sale Transaction Out` service interface:

- SAP Customer Activity Repository must be configured for use according to the business requirements of the customer
- You must be using the `CA-RT-CAR-PIP` application component

More Information

[Request Loyalty Membership Activity Journal as Bulk \[page 403\]](#)

6.4.11.1.2.1 Request Loyalty Membership Activity Journal as Bulk

Definition

To send a mass request from SAP Customer Activity Repository to loyalty membership activity.

Technical Data

Software Component	RTLPOSDM
Release State	released
Technical Name	LoyaltyMembershipActivityJournalCRMBulkRequest_Out_V1
Namespace	http://sap.com/xi/RTLPOSDM/Global2
Application Component	CA-RT-CAR-PIP
Related Web Service Definition	/POSDW/CO_LylMbrshpActJrBkReq
Category	SAP A2A
Direction	outbound
Mode	asynchronous
Idempotency	no
P2P Communication Enabled	no

Notes on Release State (Technical Data)

This operation is the successor to operation of the same name under namespace `http://sap.com/xi/BICONTENT/Global2`.

The change to the XML namespace allows for optional P2P communication.

Business Context

The operation sends loyalty information from SAP Customer Activity Repository to SAP CRM. Loyalty information can be included at the header level or at the retail line item level of the POS transaction. Customizing settings determine how the service is filled.

Features

Initially, a transaction log (TLOG) containing loyalty information is sent to the SAP Customer Activity Repository. Once data is in SAP Customer Activity Repository, loyalty information within the TLOG can be sent to SAP CRM using the operation `Request Loyalty Membership Activity Journal as Bulk`. Loyalty points/amounts are aggregated based on the customer card number.

Different options are as follows:

- Send loyalty amount at header level
- Send loyalty points at header level
- Send loyalty amount at retail line item level
- Send loyalty points at retail line item level

Main nodes of the operation are as follows:

- `MemberParty`: Contains the customer loyalty card number
- `SalesDocumentReference`: Contains the transaction number, the store ID, and the loyalty amount
- `Point`: Contains loyalty points

Prerequisites

The system must call `Maintain Loyalty Membership Activity Journal` before using the `Request Loyalty Membership Activity Journal as Bulk` operation. This operation is not available in SAP Customer Activity Repository but is available in a system that uses the operation to create loyalty membership activity with the POS transaction details.

Error Handling

Forward error handling (FEH) is not available.

As a result, any message that cannot get processed within the service implementation (for example, due to a mapping error) is rejected and a corresponding fault message is raised using `cl_proxy_fault=>raise`.

Typical errors are as follows:

- Customizing is missing for loyalty data transfer
- A duplicate customer card number is found, which means no aggregation is done
- An empty customer card number is detected

Constraints and Integrity Conditions

The operation cannot currently support inventory or summary transactions.

Notes on SAP Implementation

The `Supply CRM Loyalty Interface` task in SAP Customer Activity Repository sends loyalty information to CRM component using the service interface. This task must be set up for the retail store that is being used.

Customizing settings, under [SAP Customer Activity Repository](#) > [POS Data Management](#) > [POS Inbound Processing](#) > [Integration with Other SAP Components](#) > [CRM Integration](#), determine which fields are mapped in the operation. Different options are as follows:

- Points from TLOG header level mapped to CRM
- Amount from TLOG header level mapped to CRM
- Points from TLOG line item level summed up mapped to CRM
- Amount from TLOG line item level summed up mapped to CRM

B2B And A2A Related Information

SAP Customer Activity Repository and SAP CRM are the back-end components that are involved. The corresponding inbound service of this operation resides in the SAP CRM component.

Processing

`LoyaltyMembershipActivityProfileCode` determines if points are redeemed or awarded. The redeemed scenario is not supported for the communication between SAP Customer Activity Repository to SAP CRM (offline scenario). Therefore the value is always 13 (POS ACCURAL). In the offline scenario, the 'TypeCode' under `SalesDocumentReference` is set to 903, which is related to POS transactions.

Asynchronous outbound operations only

POS Workbench (transaction `/POSDW/MON0`) can be used to send out the service interface.

Enhancements

The `/POSDW/SE_LOYALTY_OUTBOUND` Business Add-In (BAI) is available for this operation under Enhancement Spot `/POSDW/SPOT_SE_LOYALTY`.

6.4.12 Product Property Management

Definition

Manages product category hierarchies and product properties, along with their valuations.

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	ProductPropertyManagement
Namespace	<code>http://sap.com/xi/ESM/ERP</code>

Business Context and Use

The *Product Property Management* process component enables information about the product category hierarchy.

6.4.12.1 Product Category Hierarchy

Definition

A hierarchical arrangement of product categories according to objective business aspects. Subordinate product categories represent a semantic refinement of the respective higher-level product category.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	ProductCategoryHierarchy
Object Category	Master Data Object

Business Context and Use

The *Product Category Hierarchy* business object provides the product category hierarchy.

6.4.12.1.1 Product Category Hierarchy Replication In

Definition

An interface to receive the product category hierarchy.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Product Category Hierarchy Replication In* service interface contains an operation that receives the product category hierarchy.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ☒. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> ► *<Version>* ► *Application Help* ► *SAP Customer Activity Repository* ► *Demand Data Foundation* ► *Integration Information* ► *Inbound Processing* ☒.

6.4.12.1.1.1 Replicate Product Category Hierarchy

Definition

To replicate the product category hierarchy.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	ProductCategoryHierarchyReplicateRequest_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The [Replicate Product Category Hierarchy](#) service operation is used to replicate the product category hierarchy.

Features

Message Types

- ProductCategoryHierarchyReplicateRequest_V1

6.4.12.1.2 Query Product Category Hierarchy In

Definition

An interface to search for product category hierarchies.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Query Product Category Hierarchy In* service interface contains an operation that is used by an external application to request the product category information.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ►. For more information, see the Customizing activity documentation (transaction **SPRO**).

6.4.12.1.2.1 Find Product Category Hierarchy by Elements

Definition

To find a product category hierarchy by elements.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDE

Release State	Released
Technical Name	ProductCategoryHierarchyTDMByElementsQueryResponse_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	A2X
Direction	Inbound
Mode	Synchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The [Find Product Category Hierarchy by Elements](#) service operation is used to allow an external application to provide search parameters and receive the product category information.

Features

Message Types

- `ProductCategoryHierarchyTDMByElementsQuery_sync`
Receives data for the product hierarchy search. This type can contain data for the hierarchy ID and the description.
- `ProductCategoryHierarchyTDMByElementsResponse_sync`
Returns the hierarchy data, which is based on the search criteria from the inbound message. When the input parameter (hierarchy ID or description) is not provided for the query, the system returns the default product category hierarchy with its respective nodes.
- `StandardMessageFault`

Notes on SAP Implementation

- The generated proxy in Demand Data Foundation (DDF) is the `/DMF/CL_FND_PCHTDM001QR` ABAP class. The proxy data type is used in DDF for the `/DMF/FND_PCH_ELMNTS_QUERY_MSG` incoming query message and the `/DMF/FND_PCH_ELMNTS_RSP_MSG` response message.

- DDF uses the Service Mapping Tool (SMT) for the inbound message mapping (DMF/CL_PROD_CAT_HIER_SMT *Mapping* field). No other Customizing settings are required.
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.

Enhancements

The /DMF/SE_FND_PCHTDM001QR Business Add-In (BAI) is available for this operation.

The BAI contains the /DMF/IF_SE_FND_PCHTDM001QR interface with the INBOUND_PROCESSING and OUTBOUND_PROCESSING methods.

The INBOUND_PROCESSING method is called during the inbound data mapping and can be used in the following cases:

- To overwrite the existing mapping.
- To map additional data if new elements were added to the message.

The /DMF/CO_PCH_SELBYELMNTS_MDT internal communication structure is used as the importing parameter of this method.

The OUTBOUND_PROCESSING method is called during the outbound data mapping and can be used in the following cases:

- To overwrite the existing mapping.
- To map additional data if new elements were added to the message.

The /DMF/FND_CPGH_ELEM_RESP internal communication structure is used as importing parameter of this method.

The Service Mapping Tool (SMT) allows you to enhance the inbound and outbound mapping. To enhance the mapping, you must select the /DMF/CL_PROD_CAT_HIER_SMT application as the entry point.

More Information

Supplementary components of the ProductCategoryHierarchyTDMByElementsQuery_sync inbound message are not relevant for implementing this service.

6.4.13 Source of Supply Determination

Definition

Determines the access to sources of supply and quota arrangements for external and internal procurement processes.

Technical Data

Entity Type	Process Component

Software Component Version	ESM TDM 1.2
Technical Name	SourceOfSupplyDetermination
Namespace	http://sap.com/xi/ESM/ERP

Business Context and Use

The *Source of Supply Determination* process component is used for the external and internal procurement of products. It contains a business relationship for producing products or procuring them internally, as well as size margins and costs.

6.4.13.1 Source of Supply

Definition

A source for internal and external procurement.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	SourceOfSupply
Object Category	Master Data Object

Business Context and Use

The *Source of Supply* business object provides the transportation lane information. This business object contains product-specific purchasing information per store and supplying location. The supplying location can be a distribution center or an external vendor.

6.4.13.1.1 Source of Supply Replication In

Definition

An interface to receive the source of supply data.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The *Source of Supply Replication In* service interface contains an operation that receives the source of supply data.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under **► Cross-Application Components ► Demand Data Foundation ► Basic Settings ► Define Logical Systems** **►**. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> **► <Version> ► Application Help ► SAP Customer Activity Repository ► Demand Data Foundation ► Integration Information ► Inbound Processing** **►**.

6.4.13.1.1 Replicate Source of Supply as Bulk

Definition

To replicate the source of supply data.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	SourceOfSupplySUITEReplicationBulkRequest_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	SAP A2A
Direction	Inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Replicate Source of Supply as Bulk* service operation is used for the external and internal procurement of products. It contains a business relationship, an option for producing products or procuring them internally, as well as size margins and costs.

Features

The operation creates, updates, and deletes the data.

The operation contains the following main nodes:

- External Location Identifier for the Target Location

- **Target Location Type**
Determines the target location type. Note that the type of the target location is important to distinguish among different target locations, as the target locations can sometimes have the same ID.
- **External Location Identifier for the Supplying Location**
- **Source Location Type**
Determines the source location type. Note that the type of the source location is important to distinguish among different source locations, as the source locations can sometimes have the same ID.
- **External Product Identifier**
- **Source Location Sub-Range**
Describes how the source location (especially an external vendor) categorizes the merchandise. The total range of products for a source location is divided into different categories (for example, dairy products, frozen products, and canned products).
- **Merchandise Category**
Describes how the retailer categorizes the merchandise. This category is similar to Source Location Sub-Range, but with the focus on the receiving location.
- **Purchasing Organization**
Contains the purchase organization. A location can be assigned to more than one purchasing organization; therefore, the purchasing organization is mandatory.
- **Sending System Identifier**
Logical system
- **Source of Supply Type**
Distinguishes between an internal and an external procurement.
- **External Product Identifier used by Vendor**
- **Purchasing Cost per Order Unit of Measure**
Contains the net purchasing price per order unit of measure. Multiple units of measure per order are supported. The purchasing currency must be provided, because different vendors may have different settlement currencies. This element is mandatory.
- **Priority per Source of Supply**
Defines different priorities per source of supply because a product can be purchased by different supplying locations.
- **Validity Time Frame for Source of Supply**
Contains the validity time frame for the source of supply because a certain product might only be purchased for a certain period of time at a given source of supply.
- **ERP Purchasing Info Record Number**
This element is used for the A2X communication with the SAP ERP application to create purchase orders. In the use case for promotions, this element is required to simulate the creation of a purchase order. This simulation determines the exact price information, such as reflecting scales and freight. The final creation of the purchase order overwrites the price of the purchasing info record (vendor fund with special conditions).

Message Types

- `Source of Supply SUITE Replication Bulk Request`

Error Handling

The *Replicate Source of Supply as Bulk* operation supports Forward Error Handling (FEH).

Notes on SAP Implementation

- The Interface Workbench receives all data coming through an Extensible Markup Language (XML) message. The relevant tables for this process component are as follows:
 - /DMF/MDIF_LANE
 - /DMF/MDIF_LANEPC
 - /DMF/MDIF_LANETD
- The generated proxy in Demand Data Foundation (DDF) is the /DMF/CL_FND_SOSSRPLCTBLKRQ ABAP class. The proxy data type is used in DDF for the /DMF/FND_SOSSRPLCTN_BLK_REQ incoming bulk replication message.
- The Service Implementation Workbench (SIW) is used to implement the service back-end system. The SIW uses the /DMF/II_FND_SOSSRPLCTBLKRQ project ID configuration name and the /DMF/CL_FND_SOSSRPLCTBLKRQ_SI generated service implementation class.
- DDF uses the Service Mapping Tool (SMT) for the inbound message mapping (/DMF/CL_SOS_SMT [Mapping](#) field).

Enhancements

The /DMF/SE_FND_SOSSRPLCTBLK Business Add-In (BAI) is available for this operation. The BAI contains the /DMF/IF_SE_FND_SOSSRPLCTBLK interface with the INBOUND_PROCESSING method. The BAI definition is auto-generated by the SIW tool.

6.4.13.2 Query Source of Supply In

Definition

An interface to search for sources of supply.

Technical Data

Entity Type	Service Interface
Category	SAP A2A
Direction	Inbound

Business Context and Use

The [Query Source of Supply In](#) service interface contains an operation that is used to read the transportation lane data.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under ► *Cross-Application Components* ► *Demand Data Foundation* ► *Basic Settings* ► *Define Logical Systems* ▾. For more information, see the Customizing activity documentation (transaction **SPRO**).
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.

6.4.13.2.1 Find Source of Supply by Elements

Definition

To find a source of supply by elements.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	SourceOfSupplyTDMByElementsQueryResponse_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	A2X
Direction	Inbound
Mode	Synchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Find Source of Supply by Elements* service operation is used to read the transportation lane data.

Features

Message Types

- `SourceOfSupplyTDByElementsQuery_sync`
Receives data for the transportation lane search. This type can contain data for the following:
 - `SellerPartyID`
 - `ReceivingLocationID`
 - `MaterialID`
 - `ProductSellerID`
 - `ProductCategoryID`
- `SourceOfSupplyTDByElementsResponse_sync`
Returns data for the transportation lane search, product procurement cost data, and time-dependent data based on search criteria from the inbound message. At least one of the following parameters must be provided for the query:
 - `SellerPartyID`
 - `ReceivingLocationID`
 - `MaterialID`
 - `ProductSellerID`
 - `ProductCategoryID`

The output is based on the AND operation for all input parameters provided.

- `FaultMessage`

Notes on SAP Implementation

- The generated proxy in Demand Data Foundation (DDF) is the `/DMF/CL_FND_SOSTDM001QR` ABAP class. The proxy data type is used in DDF for the `/DMF/FND_SOS_ELEMNTS_QUERY` request message and the `/DMF/FND_SOS_ELMNTS_RSP` response message.
- The Service Implementation Workbench (SIW) is used to implement the service back-end system. The SIW uses the `/DMF/II_FND_SOSTDM001QR` project ID configuration name and the `/DMF/CL_FND_SOSTDM001QR_SI` generated service implementation class.
- DDF uses the Service Mapping Tool (SMT) for the inbound message mapping (`/DMF/CL_SOSQR_SMT Mapping` field).
- If you do not select the *Unlimited* checkbox and send 0 (zero) as the maximum value, the system takes the upper limit as 1.

The method calls are as follows:

- /dmf/cl_sos_assist=>mapping_inbound_qr
- /dmf/cl_ext_lane=>lane_m_read
- /dmf/cl_sos_assist=>mapping_outbound_q

Enhancements

The /DMF/SE_FND_SOSTDM001QR Business Add-In (BAI) is available for this operation. The BAI is used to enhance the inbound message, and it is defined as an external customer BAI. A default implementation is not delivered.

More Information

Supplementary components are not relevant for implementing this service.

6.4.14 Vendor Fund Management

Definition

Manages the vendor fund information.

Technical Data

Entity Type	Process Component
Software Component Version	ESM TDM 1.2
Technical Name	VendorFundManagement
Namespace	http://sap.com/xi/ESM/TDM

Business Context and Use

The *Vendor Fund Management* process component is used to manage the vendor fund provided by vendors to motivate retailers to promote their products.

6.4.14.1 Vendor Fund

Definition

A financial incentive provided by a vendor to motivate a retailer to promote the vendor's products or product groups.

Technical Data

Entity Type	Business Object
Software Component Version	ESM TDM 1.2
Technical Name	VendorFund
Object Category	Business Process Object

Business Context and Use

The *Vendor Fund* business object provides the vendor fund information.

6.4.14.1.1 Vendor Fund In

Definition

An interface to receive the vendor fund.

Technical Data

Entity Type	Service Interface
Category	Third-Party A2A
Direction	Inbound

Business Context and Use

The *Maintain Vendor Fund* service interface contains an operation that receives the vendor fund information.

Notes on SAP Implementation

- You have ensured that the Demand Data Foundation (DDF) module in SAP Customer Activity Repository has been installed and implemented. Applications using DDF require additional installation and implementation steps. For more information, see the *Common Installation Guide* for your release. You can find this guide on SAP Help Portal for SAP Customer Activity Repository retail applications bundle at <https://help.sap.com/viewer/p/CARAB>.
- You have ensured that the logical system has been defined in Customizing under **► Cross-Application Components ► Demand Data Foundation ► Basic Settings ► Define Logical Systems** **▾**. For more information, see the Customizing activity documentation (transaction **SPRO**).
- DDF receives the data through an eXtensible Markup Language (XML) message. The data is saved in DDF. For more information, see SAP Help Portal at <https://help.sap.com/viewer/p/CARAB> **► <Version> ► Application Help ► SAP Customer Activity Repository ► Demand Data Foundation ► Integration Information ► Inbound Processing** **▾**.

6.4.14.1.1.1 Maintain Vendor Fund

Definition

To replicate the vendor fund.

Technical Data

Entity Type	Service Operation
Software Component	RTLDDF
Release State	Released
Technical Name	VendorFundRequest_In
Namespace	http://sap.com/xi/RTLDMF/Global2
Category	Third-Party A2A

Direction	Inbound
Mode	Asynchronous
Idempotency	Not applicable
Change/Update Behavior	Type 1
P2P Communication Enabled	True

Business Context and Use

The *Maintain Vendor Fund* service operation is used to replicate vendor fund information, such as the discount offered on products by a vendor to a retailer.

Features

Message Types



- Vendor Fund Request

Important Disclaimers and Legal Information

Hyperlinks

Some links are classified by an icon and/or a mouseover text. These links provide additional information.

About the icons:

- Links with the icon : You are entering a Web site that is not hosted by SAP. By using such links, you agree (unless expressly stated otherwise in your agreements with SAP) to this:
 - The content of the linked-to site is not SAP documentation. You may not infer any product claims against SAP based on this information.
 - SAP does not agree or disagree with the content on the linked-to site, nor does SAP warrant the availability and correctness. SAP shall not be liable for any damages caused by the use of such content unless damages have been caused by SAP's gross negligence or willful misconduct.
- Links with the icon : You are leaving the documentation for that particular SAP product or service and are entering a SAP-hosted Web site. By using such links, you agree that (unless expressly stated otherwise in your agreements with SAP) you may not infer any product claims against SAP based on this information.

Beta and Other Experimental Features

Experimental features are not part of the officially delivered scope that SAP guarantees for future releases. This means that experimental features may be changed by SAP at any time for any reason without notice. Experimental features are not for productive use. You may not demonstrate, test, examine, evaluate or otherwise use the experimental features in a live operating environment or with data that has not been sufficiently backed up.

The purpose of experimental features is to get feedback early on, allowing customers and partners to influence the future product accordingly. By providing your feedback (e.g. in the SAP Community), you accept that intellectual property rights of the contributions or derivative works shall remain the exclusive property of SAP.

Example Code

Any software coding and/or code snippets are examples. They are not for productive use. The example code is only intended to better explain and visualize the syntax and phrasing rules. SAP does not warrant the correctness and completeness of the example code. SAP shall not be liable for errors or damages caused by the use of example code unless damages have been caused by SAP's gross negligence or willful misconduct.

Gender-Related Language

We try not to use gender-specific word forms and formulations. As appropriate for context and readability, SAP may use masculine word forms to refer to all genders.

© 2019 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company. The information contained herein may be changed without prior notice.

Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.

Please see <https://www.sap.com/about/legal/trademark.html> for additional trademark information and notices.