Implementing the Connectivity Kit for the POS Integration Scenario

The graphical overview helps you to navigate through the whole implementation process.

- Start by verifying the #Prerequisites and making business decisions
- Continue with chapter 1. Implementation Steps of the implementation guide for the integration scenario
- Perform the integration scenario as described in Chapter 2. Operation

**Prerequisites**

You have:

- Decided to connect a POS system (SAP Enterprise POS or 3rd party system) to your SAP ERP system in order to utilize the business benefits of the integration scenario POS Integration.
- Installed your SAP ERP system with release version ERP 6.0 EhP4 and Retail Add-On EA-Retail. The software component version EA-RETAIL 604 must be installed.
  Note: The enterprise services that are necessary to implement this integration scenario are contained in the following software component versions: EA-RETAIL 604.
- Configured your SAP ERP for SAP Retail. This includes activating the corresponding SAP Retail business function set (for example, settings made using transaction SFW5). For more information, see Configuration as SAP Retail.
- Implemented your SAP ERP system as the leading enterprise resource planning system. In particular, your SAP ERP system is prepared to run the following business processes or scenarios: Master Data Management (at a minimum necessary master data is available), Promotion Management, Bonus Buy Management, Inventory Management as well as related processes or functions.
- Implemented your POS system according to your business needs.
- Installed your SAP NetWeaver Business Warehouse 7.0 system with the minimum release version service pack 19. The software component version SAP NW 7.0 BI CONT ADDON 7.04 must be installed.
  Note: The enterprise service which is necessary to implement this integration scenario is contained in the following software component versions: SAP NW 7.0 BI CONT ADDON 7.04.
Procedure

1. Implementation Steps

1.1. Security Concept

The POS Integration scenario is designed for intra-company use. Depending on your system landscape (for example, your SAP ERP system is located in your head office, your POS system is located in your store), the data exchange between your SAP ERP system and your POS system may be done through an open public network (for example, Internet).

If an open public network is used then you have to consider security aspects. Usually the communication protocol ensures security (for example, you have to use a common procedure in a computer center). For more information, see Security Concept and http://service.sap.com/security.

1.2. Installation

The following installation steps must be performed:

- It is necessary to install SAP XI/PI if this is not yet available in the retailer's landscape. The minimum version is XI/PI based on SAP NetWeaver 7.0. You can download XI/PI from SAP Service Marketplace. For more information, see SAP Exchange Infrastructure or SAP NetWeaver 7.0.
  
  Note: During the initial XI/PI installation you should import SAP products and SAP software components to the System Landscape Directory (SLD). For further information, see 1.3. Configuring Integration Scenario and Maintaining Master Data.
- We recommend that you install additional XI/PI content (XI ContentEA-RetailSP1), which is available within the software component EA-RETAIL 604. If you install a SAP Enterprise POS system SAP delivers five process integration scenarios, which should be used for effective and appropriate configuration (see 1.3. Configuring Integration Scenario and Maintaining Master Data, bullet point: 'SAP Enterprise POS mapping'). You can download XI/PI Content from SAP Service Marketplace in the download area, see SAP Exchange Infrastructure or SAP NetWeaver 7.0.
- Currently there is no standard procedure for communication between the SAP ERP system and arbitrary POS systems.
  
  - If your POS is service-enabled:
    - If the services of the POS system exactly satisfy the requirements of the services provided by SAP, then no mapping is necessary.
    - If the vendor of the POS offers a suitable XI/PI mapping, you can install the XI/PI mapping by following the vendor's installation instructions. Note that the XI/PI mapping must suit the XI/PI package.
    - If no suitable XI/PI mapping is available, you need to create the appropriate XI/PI content yourself. Contact your application consultant.
  
  - If your POS is not service-enabled, you need an appropriate XI/PI adapter.
    - If the vendor of the POS offers a suitable XI/PI adapter, you can install the XI/PI adapter by following the vendor's installation instructions. Note that the XI/PI adapter must suit the XI/PI package.
    - If no suitable XI/PI adapter is available, you need to create the appropriate XI/PI content yourself. Contact your application consultant.

1.3. Configuring Integration Scenario and Maintaining Master Data

The following graphic presents the high-level architecture of the integration scenario to enable an overall understanding of the implementation steps.
For further background information, see the Integration Overview for the integration scenario POS Integration.

The following configuration steps must be performed:

- Configure your POS system: Follow the vendor's configuration instructions to establish the settings that suit your business needs. You especially need to set up the basics necessary for data exchange with your SAP ERP system (for example, port definition).
- Configure the system landscape in your SAP XI/PI system: Start the System Landscape Directory (SLD) to maintain the elements included in your system landscape. For a detailed description see Technical System Landscape within SAP Help Portal.
  - Create technical and business system entries for your SAP XI/PI system, your SAP ERP system, your SAP Netweaver Business Intelligence and your POS system (if this does not yet exist in the customer landscape). Depending on your business needs and the ability of the POS solution, you have to create only one entry (for example, one POS system can be used for all your stores) or several entries (a separate POS system instance is needed for each store or group of stores) for the POS integration.
  - Create corresponding entries for used software products and software components. Note that SAP software products and SAP software components can be imported during initial installation of your SAP XI/PI systems and that updates can be downloaded from SAP service marketplace. Non-SAP software products and software components must be maintained manually.
  - Assign software products and software components to technical and business systems.
- Configure the integration repository in your SAP XI/PI system: Start the integration builder to create the design objects (e.g. interfaces, mappings, etc.)
- Alternatively, if you install a SAP Enterprise POS system please refer to the document 'SAP Enterprise POS setup' below to find more information about the delivered process integration scenarios which help with the configuration.
- Configure the integration directory in your SAP XI/PI system: Start the integration builder to create the configuration objects necessary for the technical connection between your SAP ERP system and your POS system. At a minimum the configuration objects 'receiver determination' and 'interface determination' must exist for every service interface used (see list of enterprise services in Integration Overview). Depending on your system landscape, additional configuration objects (for example, interface determinations, receiver agreements, sender agreement, communication channel) may be necessary.
- Alternatively, if you install a SAP Enterprise POS system please refer to the bullet point 'SAP Enterprise POS setup' below to find more information about the delivered process integration scenarios which help with your configuration.
- Configure the adapters in your SAP XI/PI system: If an adapter was installed successfully, follow the configuration instructions for the respective adapter.

SAP ERP Setup:

- Verify the proxy configuration in your SAP ERP system: Verify that the proxy configuration is complete (for example, for http / https) and, if required, activate the services by calling transaction SICF. For more details, see the XI/PI configuration guide about the Internet Communication Framework via SAP Web Application Server then Web Applications (BC WAS) then SAP Web Application Server, then Internet Communication Framework.
- Verify the RFC destinations in your SAP ERP system: Call up transaction SM59 and ensure that every RFC destination needed for
communication with your SAP XI/PI system (for example, your integration server) exists. Use the 'test connection' functionality.

- Activate the business function in your SAP ERP system: Call up transaction SFW5 and activate the business function 'ISR_RETAIL_POS_INTEG'. See the corresponding documentation (available in transaction SFW5) and especially be aware of the prerequisites described. In order to activate the business function 'ISR_RETAIL_POS_INTEG' you also need to activate prerequisite business functions. For details, see SAP ERP system, transaction SFW5.

- Create customized settings in the SAP ERP system: The data transfer from the SAP ERP system to the POS system is controlled by Customizing settings. To make these settings call up transaction SPRO and expand the Implementation Guide as follows: SAP Customizing -> Logistics General -> Retail Enterprise Services -> Outbound Messages.

Here you find an 'overall information' guide document providing further information about subsequent menu points.

- Maintain master data in your SAP ERP system
  You are able to restrict the transfer of master data from the SAP ERP system to the POS system by the use of filters (Transaction: WESF). The filter tool is part of the service outbound framework.
  You have various possibilities to define filters to ensure that only POS relevant master data will be transferred. For more information about how to define filters, see the general description of the service outbound framework and the POS specific service outbound framework.
  In order to use the service outbound framework's filter tool efficiently you have to maintain the master data accordingly to ensure a smooth transfer to the POS system.
  For example: If you want to transfer only a subset (POS relevant) of article data of the whole available assortment from the SAP ERP system to the POS system you have to figure out which master data indicator would make the most sense to be used as a filter criteria. Articles can be differentiated in the range of article numbers (e.g. R100000 to R100100), by article type (for example, perishables), merchandise categories (for example, milk products).

- Service Outbound Framework Description
  The service outbound framework allows you to send data to other systems by the use of enterprise services. The receiving system is a POS system.
  In order to use the service outbound framework you have to maintain the customizing settings for the service outbound framework in your SAP ERP system: You need to customize the initial settings of the service outbound framework to ensure the correct transfer of required data from SAP ERP to the POS system.
  POS relevant customizing nodes and menu entries are available with the activation of the business function 'ISR_RETAIL_POS_INTEG'.
  For more information see the general description of the service outbound framework and the POS specific service outbound framework.
  Activate the creation of change pointers for delta transfer of data.
  You can activate the creation of change pointers to execute the delta transfer of master data (Transaction: BD50). Note the exceptional settings (see chapter: 1.3: Bullet point: Service Outbound framework description) if you use more than one application.
  For the following message types the creation of change pointers can be activated (available after the activation of the business function ISF_Retail_POS_INTEG):
  
  - WES_BB
    Changes of bonus buy for retail incentive service
  - WES_MCH
    Changes of merchandise category and merchandise hierarchy
  - WES_Promotion_BB
    Changes of promotion and bonus buy for retail event service
  - WES_MERCHANDISE
    Changes of products inclusive price dat
  
  - (Optionally) Create BAdI implementation in your SAP ERP system:
    For each enterprise service SAP delivers BAdI definitions that can be used to modify entries of messages.
    To create BAdI implementations or view further documentation call up Transaction SPRO and expand the Customizing as follows: SAP Customizing -> Logistics General -> Retail Enterprise Services -> Outbound Messages -> Enhancements Using Business Add-ins.

- Maintain Reference Store Assignment to Store
  To minimize data volume and therefore optimize system performance, you can update multiple (dependent) stores by using one assigned reference store. The reference store is the only store which is actively updated by the processed merchandise message, which can be applied with the service outbound framework. The updated data of the reference store is copied to all dependent stores and the reference store itself into the receiving store node of the created message. The prerequisite for using this functionality is that the assortment including sales prices of all stores is the same. Therefore the user has to verify manually this prerequisite. Also, at this point in time this functionality can only be used for the merchandise service which is the service transferring/updating article data including sales and purchase prices.
  The menu can be reached as follows: SAP Menu -> Logistics -> Retailing -> Distributed Retailing -> Enterprise Services -> Outbound -> Configuration -> Maintain Reference Store Assignment to Store. There are different methods of defining a reference store. See the documentation for the "Reference Store" field for more details.

SAP NetWeaver BI system:

- Maintain your SAP NetWeaver BI system
  The implementation of the inbound service 'POS Transactions' is completely embedded in the existing POS Data Warehouse infrastructure and environment using internally the same application program interface /POSDW/CREATE_TRANSACTIONS_INT that is called in RFC, BAPI or IDoc processing as well. The structure of the service operation 'PointofSaleTransactionERPBulkCreatRequest_In' is mapped to the importing parameter of table type /POSDW/TT_TRANSACTION_INT that carries the POS transactions.
  The meaning of this is that using the service operation is an alternative method to import POS transactions into POS DW and therefore needs the same configuration within the implementation guide as it is necessary for the other interface technologies (RFC, BAPI or IDoc):
  
  - Depending on the POS DM customizing settings (transaction: /N/POSDW/IMG) for the store sending the data: It is possible to post the incoming data immediately or to use the inbound queue of POS DM (transaction: /N/POSDW/QMON and /N/POSDW/QDIS) to post the data in a separate processing unit/step.

SAP Enterprise POS setup:

- SAP Enterprise POS mapping
  SAP delivers five process integration scenarios, which provide an overview of the necessary configuration objects and serves as a template for effective and perfect configuration. To apply the process integration scenarios for the use of SAP Enterprise POS, the corresponding content packages 'TE STORE CONNECTIVITY 1.0', 'STORE CONNECTIVITY 3.0' must be installed. You will find the following integration scenarios:
  
  - MerchandiseReplication_SAP_ERP_to_SAP_Enterprise_POS
To utilize the benefits you have to

- Import the 'process integration scenarios' from the enterprise service repository in order to create a configuration scenario
- Complete the configuration by navigation through the configuration scenario
- Procedure for configuration using of SAP NetWeaver 7.0
  - Be aware that the term 'integration scenario' is used in this release instead of the term 'process integration scenario'.
  - Call up the integration builder and log on to the integration directory (in your SAP XI/PI system); you reach the ‘Configuration: Integration Builder’ screen.
  - Call ‘Tools -> Transfer Integration Scenario from Integration Repository’ and you reach the dialog box ‘Transfer Integration Scenario from the Integration Repository’.
  - Enter the name of the integration scenario in the ‘Name’ field (alternatively, you can use the input help).
  - Choose ‘Continue’, enter a name for the configuration scenario and choose ‘Finish’ to create the configuration scenario.
  - After selecting ‘Close’ a new screen ‘Integration Scenario Configurator’ appears. On this screen you can see a list of configuration steps as well as a graphical representation of included objects (component view).
  - Follow the configuration steps to add missing data, for example, information that depends on your system landscape or on your business needs (for example, business system, receiver determination and mapping).
  - Activate the configuration scenario.

- Procedure for configuration using of SAP NetWeaver 7.1
  - Call the integration builder and log on to the integration directory (in your SAP XI/PI system); you reach the ‘Configuration: Integration Builder’ screen.
  - Call ‘tools -> apply models from ES repository’ and you reach the dialog box ‘Transfer Model from ES Repository’.
  - Select the radio button ‘Process Integration Scenario’ and enter the name of the process integration scenario in the ‘Name’ field (alternatively, you can use the input help).
  - Choose ‘Continue’, enter a name for the configuration scenario and choose ‘Finish’ to create the configuration scenario.
  - After selecting ‘Close’ the model is loaded from ESR and a new screen ‘Model Configurator’ appears. On this screen you can see a list of configuration steps as well as a graphical representation of included objects (component view).
  - Follow the configuration steps to add missing data, for example, information that depends on your system landscape or on your business needs (for example, business system, receiver determination, mapping).
  - Activate the configuration scenario.

Extending a XI/PI structure
If an Enterprise Service does not contain enough data for the target system the customer is able to extend the corresponding PI-Structure. How this can be done is describe in the Enterprise Service Enhancement Guide.

1.4. Prepare Change of IT Operation Concept

Consider the activities mentioned in chapter 2 (operation) under 'regularly planned batch reports', 'process monitoring' and 'regular housekeeping reports' and include them in your existing IT operations concept where all other regular activities are scheduled. Include the batch jobs in the respective job scheduling.

1.5. Test Integration Scenario

After having completed all previous steps it is important to test the whole scenario. Therefore you shall include both an SAP ERP system and a POS system in your test landscape. Execute the steps described below under chapter 2 (operation) in your test landscape and use this integration test to ensure that all settings and installations lead you through the process with the expected results.

2. Operation

Within the SAP ERP system there is a menu ‘Enterprise Services’ containing all programs needed for data exchange within the integration scenario ‘POS Integration’. This menu can be reached as follows: SAP Menu -> Logistics -> Retailing -> Distributed Retailing-> Enterprise Services.

The following sections are about how to execute your operational business. Before performing the following the customizing settings described above must be maintained at first. To run the integration scenario the following steps must be performed:

- how to initiate/start the process
- regularly planned batch reports
- exceptional program operations
- process monitoring
- regular house keeping reports

How to initiate/start the process

Within your SAP ERP system the following steps must be performed
• Transfer master data from the SAP ERP system to the POS system
  • Initialization:
    This is a "set up" process which will be usually executed once.
    Start the service outbound framework to perform an initial transfer of merchandise category data (incl. hierarchy) and product
    inclusive price (purchase and sales) data. The program can be reached as follows: SAP Menu -> Logistics -> Retailing ->
    Distributed Retailing -> Enterprise Services -> Outbound -> Messages -> Create Messages for Application.
    In this dialogue you need to select the "POS application" and the "service implementations" controlling the replication of data.
    You are able to select multiple "service implementations" by choosing the "multiple selections button".
    Possible service implementations are available after the activation of the POS Business Configuration set (BC-set):
    0100 Replication of Articles (product and price data)
    0200 Replication of Material Groups (Merchandise category data)
    For the initial data transfer select the "initialization" radio button. After the first data transfer you can use the delta transfer - see:
    Regularly planned batch reports.
    By activating the checkbox "Test run only" you are able to test the whole functionality of the service outbound framework with the
    benefit of not sending the actual message. The display log shows the data to be transferred.

• Transfer strategic sales / transactional data from SAP ERP system to the POS system
  • Transfer of promotional and bonus buy data:
    Start the service outbound framework to perform the transfer of promotional data and/or bonus buy data. The program can be
    reached as follows: SAP Menu -> Logistics -> Retailing -> Distributed Retailing -> Enterprise Services -> Outbound -> Messages
    -> Create Messages for Application.
    In this dialogue you need to select the "POS application" and the "service implementations" controlling the replication of data.
    You are able to select multiple "service implementations" by choosing the "multiple selections button".
    Possible service implementations are available after the activation of the POS Business Configuration set (BC-set):
    1000 Replication of Retail Promotions (Promotional data)
    1100 Replication of Bonus Buys (Bonus buy data)
    For the initial data transfer select the "initialization" radio button. After the first data transfer you can use the delta transfer - see:
    Regularly planned batch reports.
    By activating the checkbox "Test run only" you are able to test the whole functionality of the service outbound framework with the
    benefit of not sending the actual message. The display log shows the data to be transferred.

Within your POS system the following steps must be performed:

• To initiate the process a data transfer from the POS system to the SAP ERP system is not necessary.

After the provision of master data and strategic sales / transactional data the operational procedure starts with any POS transaction occurred in
your POS system (for example, sale of items) or any update of master data or strategic sales / transactional data send from the SAP ERP system
to the POS system (for example, promotion of certain merchandise or changes in prices of articles).

Regularly planned batch reports

Within your SAP ERP system the following programs should be scheduled (or started manually)

• Delta updates - the transfer of data changes will be the daily business routine and therefore the most used service outbound framework
  operation.
  Here only data changes since the last replication will be transferred to the POS system.
  • New and changed master data and strategic sales / transactional data is transferred via delta handling by the use of the service
    outbound framework.
  You have to select the messages that you would like to send in a specific batch job. Save the data as a variant and schedule a
  periodic background job. Due to performance reasons you should not include all service implementation within the same
  program execution. The service outbound framework can be reached as follows: SAP Menu -> Logistics -> Retailing ->
  Distributed Retailing -> Enterprise Services -> Outbound -> Messages -> Create messages for application.

For your POS system the following program should be scheduled

• Transfer of transactional data from the POS system to the SAP NetWeaver BW system
  A transfer of POS data
  A transfer of POS data should be scheduled according to your business needs and under considerations of performance aspects
  of your system landscape.

For further information, see the execution instruction of your POS system

Exceptional program operations

Within your SAP ERP system the following programs can be executed manually.

• Manual request for data transfer
  The manual request setting in the service outbound framework should be an exception and should be used when recovering missing
  data. Therefore this setting allows you to influence the POS predefined filter criteria. The filter button "Free Selection" will be activated
  with the radio button "manual request". The free selection enables you to manipulate the POS predefined filter criteria, so that you
  can transfer any data you like.
  The service outbound framework can be reached as follows: SAP Menu -> Logistics -> Retailing -> Distributed Retailing -> Enterprise
  Services -> Outbound -> Messages -> Create messages for application
Notes on how to use the free selection filter:

In combination with check box:

- "Pre assign Free selection with defined filter criteria":
  Activating this checkbox will fill the free selection filter with the pre assigned filter criteria(s) of the filter criteria transaction "WESF" (for the selected service implementation only).

- "Override Defined Filter Criteria with Free Selection":
  The settings you make in the free selection filter will influence the data transfer and not the pre assigned filter criteria from transaction "WESF" (for the selected service implantation only).

- "Process Data Records with delete information":
  The activation of this checkbox will additionally transfer deleted master data.

Process monitoring

Within your SAP XI/PI system monitoring can be done as follows:

- Start the SAP standard 'monitoring functionality' of your integration engine (for example, transaction SXMB_MONI in your SAP XI/PI system). You can see every message sent to the SAP XI/PI system and passed on to another system.

Within your SAP ERP system additional monitoring can be done as follows:

- Data transfer from the SAP ERP system to the POS system
  The tools to monitor and analyze the data transfers done by the service outbound framework can be found as follows: SAP Menu -> Logistics -> Retailing -> Distributed Retailing -> Enterprise Services -> Outbound -> Monitor -> Display Logs

- Master Data
  Every execution of the service outbound framework is recorded by using SAP's standard functionality 'application log'. You can view the application log by starting corresponding entries from the menu. Then you can see the program executions in the upper part and the messages (created by a program run) in the lower part of the screen. After executing the 'XI/PI message' button in the lower part of the screen you'll reach the screen 'monitor for processed xml messages'. Here a similar functionality is available to that provided by the monitoring functionality in an SAP XI/PI system (transaction SXMB_MONI). In particular, you can see the status of a sent message or the included data. Be aware that you can see only information about the data transfer from the SAP ERP system to the SAP XI/PI system, but not about the data transfer from the SAP XI/PI system to the POS system (this information is available solely in the SAP XI/PI system).

- Strategic Sales / Transactional Data
  The data transfer of promotions and bonus buys from SAP ERP to the POS system can be monitored with the monitoring functionality in the SAP ERP system (transaction SXMB_MONI), but no entry is created in the 'application log'.

- Data transfer from the POS system to the SAP NetWeaver BW system
  The data transfer of transactional data from the POS system to the SAP BW system can be monitored with the monitoring functionality in the POS Data Management workbench (transaction: /N/POSDM/Mon0).
  Note: It is not possible to identify how the data has been imported into POS DM (via enterprise service, Idoc, RFC or BAPI). To identify if the imported message you are able to use the inbound queue of POS DM. The XML messages of the inbound service can get identified in the queue monitor with the fields "Key" that carries the global unique identifier of the message instance and 'Object Type = XML_DOC'.
  Also: There is no Postprocessing Office (PPO) available within SAP NetWeaver BW. Therefore in case of processing errors within SAP NetWeaver BW the incorrect inbound messages can not be analyzed and reprocessed.

For monitoring in your POS system, note the execution instructions for the POS system.

Regular housekeeping reports

Obviously, housekeeping depends on the system:

- Housekeeping within your SAP ERP system
  Besides data from SAP's standard functionality 'application log', no data has to be deleted.
  Use SAP standard functionality to delete entries in the application log that are no longer needed.

- Housekeeping within your SAP XI/PI system
  Use the SAP standard functionality to delete messages that are no longer needed.

- Housekeeping within your POS system
  Note the execution instructions for your POS system.

- Housekeeping within your SAP NetWeaver BW system
  Note the execution instructions for your BW system.