SAP Function in Detail
SAP Solutions for RFID

SAP® SOLUTIONS FOR RFID

CONTENTS

EXECUTIVE SUMMARY

SAP® solutions for radio frequency identification (RFID) are a breed of applications that can sense and respond to the real world, bridging the gap between the physical world and the world of data in IT systems. SAP solutions for RFID drive business productivity by automating data capture, as well as supporting the serialization of products and assets. With serialization, a unique serial number applies to every item in the master database. Such granular identification can enhance product visibility, improve data accuracy, and improve decision making throughout the company's supply chain.

SAP solutions for RFID thus enable "real-world awareness" by sensing and responding to the presence and movement of objects in real time. The solutions facilitate agile supply chain execution, efficient asset management, and adaptive manufacturing. SAP solutions for RFID are proven and scalable solutions that seamlessly integrate real-time data into enterprise applications. The solutions are comprised of two key building blocks:

SAP Auto-ID Infrastructure

The SAP Auto-ID Infrastructure offering is a site-level solution for managing auto-ID-enabled (serialized) objects – from commissioning through reconciliation and association with business context. It enables organizations to integrate this real-world and serialized data into the business.

SAP Object Event Repository

The SAP object event repository is the centralized system of record that supports the orchestration of auto-ID instances across the enterprise and facilitates inter- and intracompany tracking of serialized objects. In conformance with the Electronic Product Code Information System (EPCIS), it harmonizes internal auto-ID serialization with auto-ID signals from outside trading partners, all within an active, real-time-event-driven engine. The SAP object event repository can support any number of SAP Auto-ID Infrastructure instances, which are responsible for managing serialized data, events, and business processes (EPC or other) at a local level, such as a warehouse or a manufacturing plant.

SAP Auto-ID Enterprise

Combining SAP Auto-ID Infrastructure and object event repository into a single solution, the SAP Auto-ID Enterprise offering leverages serialized information in a wide variety of supply chain, manufacturing, service and asset management, and compliance applications. Companies now undertaking or considering serialization projects can regard SAP Auto-ID Enterprise as a strategic asset.

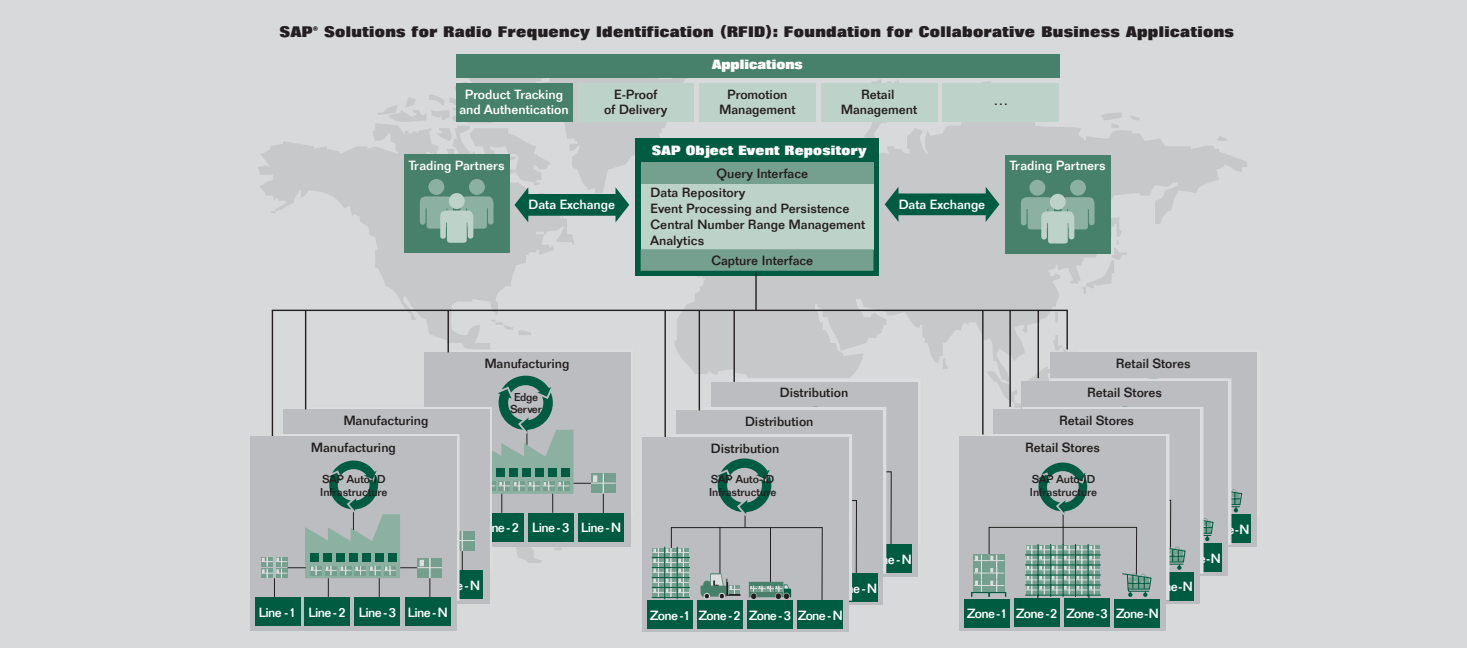


Figure 1: SAP Auto-ID Enterprise

INTRODUCTION

Business Challenges

SAP solutions for RFID, like many other SAP offerings, have been engineered with the goal of helping modern enterprises adapt to the needs of a rapidly evolving business climate.

Competitive pressures are growing from year to year:

- With the continued evolution of globalization and offshoring, competitors are reducing direct material and labor costs, as well as providing innovative new service offerings.
- Consumer "big box" retailers are negotiating low prices, and are looking for annual reductions as supply chain efficiencies improve.
- SKUs are proliferating in all industries, as companies compete for shelf space and mind share. Private labels compete with name brands, promotional SKUs abound, and "mass serialization" drives products with millions of configured options.
- Supply chain velocity is increasing, as companies squeeze out inventory by moving from monthly to weekly to daily replenishment cycles, and extended visibility from POS and RFID allow companies to move to more demand-driven processes.

Concurrently with competitive pressures, there are growing requirements coming from the regulatory and compliance side:

- In the United States, the Department of Defense unique identification (DoD UID) initiative mandates that all significant assets be direct-part marked so they can be serialized and tracked from birth (typically using two-dimensional bar codes).
- Around the world, concerns about counterfeiting and diversion of pharmaceutical products are stimulating new laws and regulations requiring product serialization or generation of electronic "pedigree" documents that certify the chain of custody of product from manufacturer to dispensing pharmacy.
- Aerospace and other industries with important safety obligations are required to create and maintain "as-built" genealogies and trace the maintenance history of vehicles and components.
- The retail industry faces mandates for case and pallet tagging on a global scale.
- Health and safety concerns and liabilities are driving requirements for more rigorous employee protection, as well as asset maintenance and reporting.
- Finally, emerging environmental concerns are imposing stricter requirements for recycling, reverse logistics, and appropriate disposal – for example, the Waste Electrical and Electronic Equipment Directive in the European Community.

Beyond Compliance

These applications are being implemented not only for compliance reasons, but are driving business value in many innovative ways, including the following:

- Recall management
  - Food, drug, and cosmetic companies are finding an increasing need to track their products in their downstream supply chain, and to potentially recall them if contamination or tampering is suspected.
- Cold chain tracking in food and life sciences for perishable goods and information on their "condition"
- Manufacturing and logistics visibility for outsourced manufacturing overseas such as Asia-Pacific
- Increasing medical caseloads and the need to reduce lethal complications due to medication errors
- Asset maintenance and repair
- Automotive kanban management
- Reduction of counterfeiting and gray-market activities

Together, these trends are driving organizations to be more innovative in improving processes, maximizing productivity and asset utilization, while at the same time providing greater compliance and traceability. RFID and serialization address these challenges.

Technology and Market Evolution

Though available since the 1920s and used in World War II to identify airplanes as friend or foe, RFID technology made major strides in the late 1990s (see Figure 2). RFID is no longer an experimental technology with expensive tags, driven by corporate and government mandates, and suitable only for early adopters. As of 2007, technology has matured and come down in price, and applications are being announced almost daily, in almost every industry.

	From (pre-2006)	To (2006 forward)
Market Drivers	**Compliance to Retail and Government Mandates** – Retail compliance: – Case and pallet level – Item-level tagging for Pharma CII compliance – Logistics (shipping and receiving), asset tracking	**Compliance and Value** – Retail and other compliance mandates still dominant – Beyond compliance, value initiatives emerging at industry leaders – Proof points across multiple industries – Logistics, asset tracking, manufacturing, supply chain, etc.
Technology Focus	**RFID Physics and Infrastructure** – Hardware infrastructure: Tags, readers, printers, devices – Device integration: Filtering, aggregation, management, control – Physical attributes: Form factor, packaging configurations, environment, metals or liquids	**Beyond Basics** – Market maturing for hardware, tags, installation expertise (art to science) – Gen2 Tags – leap forward in read rates – Focus changing to using the data: Serialization, EPCIS, Pedigree, etc. – Emergence of advanced sensors, motes, active tags, etc.

Figure 2: RFID Market Evolution

Classes of Applications

The customer base for SAP solutions for RFID has also grown and matured. SAP now has about 250 customers in more than 17 industries, with a wide variety of applications that extend beyond "slap and ship" compliance to supporting value-driven processes in a variety of areas. These applications fall into four major classes:

Automation. In this class of applications, the primary business motivations are to leverage auto-ID to increase the efficiency of the workforce required to execute a business process or to increase data accuracy of the process to drive improved decision making or customer service. For example:

- Goods issue and receipt via automatic shipping and receiving processing based on bar code and RFID reads, eliminating the need for information workers to manually post transactions
- The ability to capture many RFID reads at one time, without line of sight, to enable a full lift truck to pass through a portal without individual case scanning or to identify all of the tools in a box without opening the box and individually scanning the tools

Track and trace. In this class of applications, the business value is derived from being aware of the status and location of serialized objects within the enterprise or across the supply chain. For example:

- A producer of a controlled substances needs to be aware of the location of all materials within its facilities to maintain tight controls and prevent shrinkage.
- A company shipping product wants to verify a customer's deduction claim for items not received.
- A consumer products company, with visibility into the quantity and location of its product within the retailer's distribution center, store back room, and store shelves, can generate alerts to prevent out-of-stock situations – especially in cases of promotion execution or new-product introductions. This same company can combine RFID data with other forms of POS data to automate replenishments and optimize inventory levels.
- A company with products prone to counterfeiting can use serialization to provide an authentication service for its customers or to provide detailed pedigree information certifying the chain of custody of the product. This same company can leverage the information to support product expiration management or a product recall campaign.

- Companies with mobile assets such as tools and containers can use serialization to drive higher asset utilization by tracking the "turns" of these assets between their facilities and their customer facilities. The company can send an alert, or even bill, if an asset is not returned in a timely manner.

Decision support and analytics. Data captured through the process of tracking serialized information through the supply chain is an invaluable source for business analysis applications to identify trends and drive continuous improvement. For example:

- Serialized product traced through a production line can identify the variability in cycle times at different operations as a function of the product type. This can help fine-tune line balancing and identify products with an unacceptable frequency of delays or quality problems.
- Product movements through the supply chain can be used to derive information about inventory levels and lead times, which can highlight performance issues.
- The movement of products with shelf-life constraints can be evaluated to detect process abnormalities that result in out-of-FIFO handling, driving inventory obsolescence issues.

Enriching business solutions. This area is more difficult to categorize, as it is the collection of highly innovative applications of RFID and serialization that SAP customers have designed that take advantage of the technology in unique ways – enabling capabilities that were previously impossible. For example:

- Companies with business processes based on consigned product (such as medical devices, tools) can trigger customer billing more accurately and more quickly based on receipt of information about serialized product.
- Hospitals are using RFID technology to track the process of administering drugs to patients to improve accuracy and reduce medication errors.

BUSINESS PROCESSES ADDRESSED

A core concept of SAP solutions for RFID is the enablement of business processes. Business processes can be configured as a series of rules, which are triggered by events, and which in turn trigger a series of activities that perform validations, communicate with the devices in the network, trigger transactions in the back-end business system, and trigger communications with trading partners.

Using this flexible technology as a base, SAP solutions for RFID are delivered supporting a set of business processes "out of the box." The solutions execute many of the standard processes associated with auto-ID. These processes can be deployed as is, or can be modified and extended using the configurable rules process.

The primary standard business processes supported by SAP solutions for RFID are described below:

Outbound Shipment

SAP solutions for RFID enable customers to support the basic operating steps required to ship serialized product to customers. These steps include:

- Generating serial numbers (EPCs)
- Commissioning RFID tags (or printing bar codes)
- Associating tags or bar codes with items, cases, or pallets
- Generating flexible multilevel hierarchies for cases, inner packs, and pallets
- Scanning and tracking outbound items associated with loading
- Associating serial numbers with delivery documents
- Verifying delivery requirements at the data-capture source
- Processing goods issue in the back-end enterprise resource planning (ERP) application
- Automatically triggering the sending of an advanced shipment notice (ASN) document to the customer, based on predefined conditions

The outbound shipment business process operates in two modes. The "slap-and-ship" mode is best suited for companies interested in basic "slap-and-ship" processing, while the "integrated" mode is recommended for companies that wish to extend the visibility of serialized information into their ERP system and provide for linkage between the order-to-cash process and the detailed serialized information. In some situations, SAP customers begin with the stand-alone mode and upgrade in a future phase to the integrated model.

Inbound Receiving

The inbound receiving business process supports the standard elements that would be required by a company that needs to receive serialized product. This includes the following:

- Handle receipt and management of an ASN
- Capture inbound serialized information as it is scanned upon receipt
- Validate serial numbers against the inbound ASN
- Associate serial numbers with the inbound delivery document
- Process goods receipt in the back-end ERP application
- Automatically generate proof-of-delivery documentation based on predefined conditions

Returnable Transport Item Tracking (RTI)

A common requirement is for companies to track mobile assets that would originate in their facility, get shipped to a trading partner's facility, and then return. Examples of returnable transport items (RTIs) could include pallets, intermediate bulk containers, gas cylinders, and kegs. This scenario is the basis for many asset management applications, where the goal is to track the location and status of assets in order to improve asset utilization. The same scenario is also the basis for various consignment scenarios. The standard SAP RTI process supports the following steps:

- Tracking of returnable container current and historic locations, from supplier to customer and back again
- Commissioning and maintenance of RFID tags or bar codes placed on returnable assets using the standard global returnable asset identifier format
- Tracking of the asset through the various operations within the supplier's facility, such as packing, loading, unpacking, and unloading
- Tracking of the asset through the various operations within the customer's facility
- Automatic monitoring of events, such as empty and full status, using event management tools that alert relevant parties of unintended or unexpected events or changes in status

Kanban

The kanban scenario supports the serialization of totes that are used in a manufacturing process and the automatic triggering of kanban "pull signals" as totes pass through a scanner that detects whether they are full or empty. This process is especially effective with RFID, where a number of totes can be conveyed on a lift truck through a portal to capture many signals simultaneously without scanning them individually. Kanban functionality supports:

- Upon detection of an "empty" signal, automatic kanban status change and creation of a replenishment element (for example, a PO)
- Upon detection of a "full" signal, automatic kanban status change, goods receipt posting and creation of the material document

Product Tracking and Authentication

Product tracking and authentication is a process supported by SAP solutions for RFID, enabled with the introduction of the SAP object event repository. It provides functionality to support business processes to track serialized information through the supply chain. It also provides services to authenticate that the serialized product originated from a trusted source and arrived at the intended destination.

This functionality is based on the serialized content stored in the SAP object event repository in conjunction with business information from back-end business systems. The key functionality of the product tracking and authentication module includes the following:

- Capture
  - EPCs, hierarchies, locations, and events from local SAP auto-ID infrastructure instances and third-party systems
  - Business object data from back-end ERP and other business applications
  - Association of EPC information with business objects such as batches and lots, orders and deliveries, and other characteristics
  - Data exchange from trading partners
- Product tracking (via query interface or user interface)
  - By EPC – status, location, events
  - By order or other business characteristics (batch)
  - By issuing alerts via event management (for example, a shipment did not arrive at the intended destination)
- Authentication
  - EPC authentication
  - Extended authentication against secondary characteristic such as tag-ID, holospot, or other unique identifier, and location
  - Logging of authentication attempts, responses

SOLUTION ELEMENTS

Thanks to experience gained from more than 250 customers, SAP solutions for RFID have matured as a scalable and sustainable foundation. This section describes further details about the elements comprising of SAP solutions for RFID, and describes how these elements fit into a broader SAP strategy of leveraging serialized information in support of a wide variety of business processes.

There are three main concepts embodied in SAP solutions for RFID:

Unique identification of objects – The first concept is to support unique identification of objects so that objects can be managed throughout their life cycle. Unique serial numbers are typically associated with assets such as equipment and inventory. This information is used to drive visibility, automation, accuracy, product life-cycle management, and compliance across business processes within the enterprise, as well as outside the four walls of the enterprise. They leverage data-exchange standards such as EPCIS framework from EPCglobal and UID standards from the U.S. DoD. Using these standards, companies can exchange information about serialized objects with trading partners to gain extended visibility into the entire supply chain.

Automation of logistics processes – The second concept is to leverage the benefits of RFID and intelligent sensor technology to automate and reengineer logistics processes and improve accuracy and productivity. This is supported through the following:

- Rapid scanning without line of sight or direct human action
- Writing and rewriting data into the RFID tags
- Capturing information such as location, temperature, or physical or chemical change

Auto-ID technologies provide rich data granularity and abilities for automation, which will foster innovation in applications and new business models.

Scalability – The third concept is to provide a scalable solution that can enable organizations to comply with mandate-driven initiatives, yet grow the deployment to take advantage of next-generation applications.

SAP solutions for RFID address these concepts as well as the following:

- Need for an enterprise-wide view for object data
- Tagged product flow at multiple locations and multiple local processes
- Centralized data exchange with trading partners
- Single set of interfaces and repository to a growing number of enterprise applications
- Need to combine various data streams (EPC, transaction, and POS) to drive business value
- Emergence of enterprise-centric applications such as electronic proof of delivery, promotions management, and replenishment
- Emergence of network-centric applications, such as product tracking and authentication and out-of-stock reduction

SAP views serialization as a strategic enabler of a new family of applications that will enhance asset management, supply chain management, reverse logistics, contract management, and a wide variety of other business processes.

The core of this strategy involves the following:

- A software foundation that facilitates serialization, not as a point solution, but as part of the application infrastructure
- The integration of serialization activities into a wide variety of business processes, and the association of business information from a variety of business applications with serialized data

Leveraging data and functionality residing in both SAP and non-SAP business applications, SAP solutions for RFID integrate the serialization activities originating from core production and distribution facilities of manufacturers, wholesalers, retailers, and service providers. Serialized data is created, captured, and associated with relevant business objects such as batches, ASNs, deliveries, and orders. This data is then stored in a centralized repository, and is accessed and exchanged with trading partners in support of the above-listed business processes.

There are two major elements of SAP solutions for RFID, which are described in detail in the following sections:

- **SAP Auto-ID Infrastructure** facilitates the capture of serialized data from the devices at local sites and provides the business context to turn the date into meaningful business events. SAP Auto-ID Infrastructure commissions, configures, maintains, and translates serial numbers (EPC, UID, and others) as necessary for building the first-level product-information layer. It also communicates with the business applications (SAP or non-SAP) to access the business context information necessary to properly validate and store serial information. Communications are generally handled via the **SAP NetWeaver® Exchange Infrastructure (SAP NetWeaver XI) component**. SAP Auto-ID Infrastructure includes preconfigured business functionality for inbound receiving, outbound shipment, e-kanban, and more. These processes are explained later in this document.
- Serialized information collected by SAP Auto-ID Infrastructure (or other EPCglobal compatible middleware) is often detailed, and is stored in the auto-ID infrastructure instance that is local to the originating site. Some of this information is routed to the **SAP object event repository**, where it is available to support applications that require visibility between sites in the enterprise, or between the enterprise and other trading partners, to support a full range of business processes.

Altogether, the architecture of SAP solutions for RFID maps closely to the reference architecture established by the EPCglobal organization, a nonprofit worldwide standards group made up of vendors and users that drafts specifications based on EPC. SAP's differentiation is in developing a foundation based on these standards, while also preserving tight integration with the business data coming from business applications. SAP has observed that its customers extract maximum business value from serialized information only when they have the ability to associate this information with a wide variety of business objects, such as customers, orders, invoices, products, contracts, and many more.

SAP Auto-ID Infrastructure

The SAP Auto-ID Infrastructure offering is the element of SAP solutions for RFID that directly supports site-level serialized processes. SAP Auto-ID Infrastructure is shown in Figure 3.

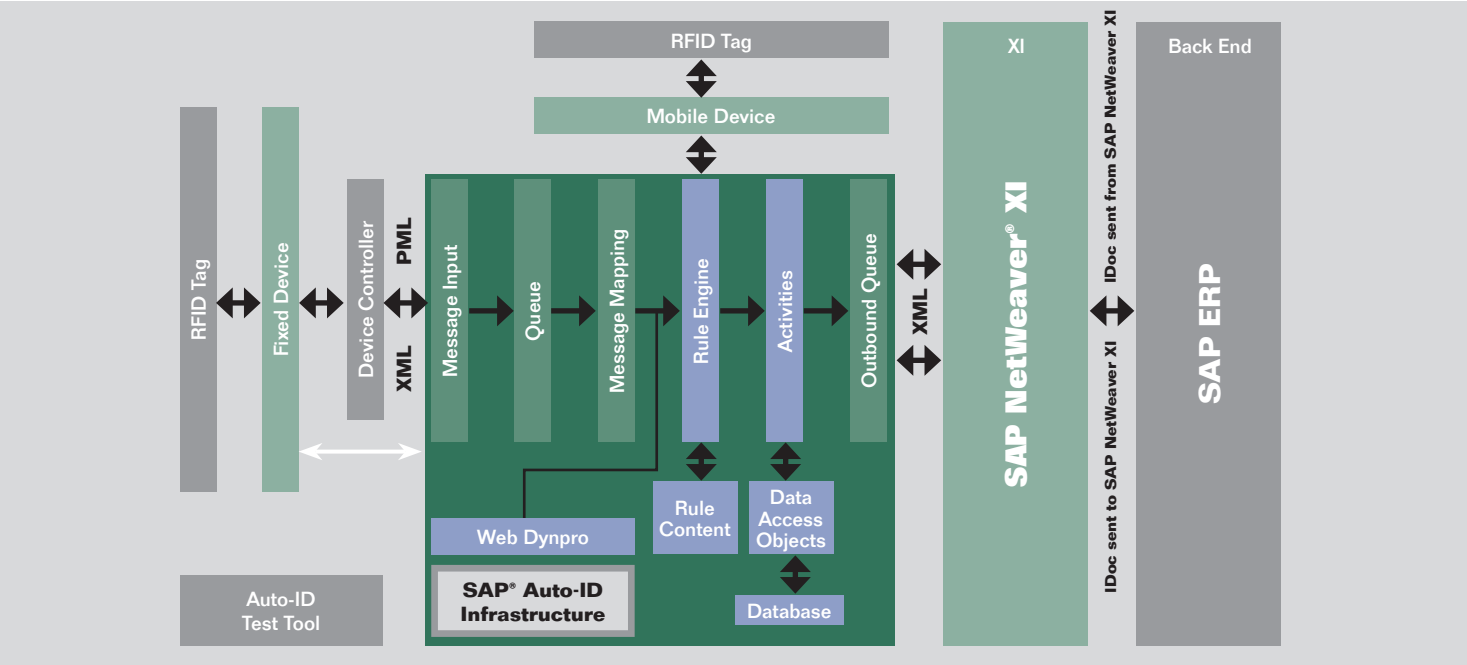


Figure 3: SAP Auto-ID Infrastructure Landscape

Core SAP Auto-ID Infrastructure Elements

Core elements of SAP Auto-ID Infrastructure include the following:

- **Mapping and rules processor** – Messages arriving from devices on the plant or warehouse floor are mapped, based on device location and event type to configurable rules, which determine the business event that has occurred and what sequence of activities to execute.
- **Activities** – Discrete programs perform a specific action such as validations, updates, and communications required to execute the business process. Activities contain parameters such as exception criteria and thresholds. Activities are based upon the ABAP™ programming language workbench, which allows a company to modify existing activities and create its own to match its business requirements.
- **Routing engine** – The interpreted data in SAP Auto-ID Infrastructure is mapped to the relevant business objects inside the SAP Business Suite family of business applications, including the SAP ERP application, to facilitate automation of business processes. Using the mapping functionality of SAP NetWeaver XI, it is also possible to map to processes and data in non-SAP applications.
- **Prepackaged, configurable support for business processes** – Many business processes are supported by preconfigured content, including inbound receiving, outbound shipments, and RTI tracking. These processes, as described in the previous section, can be deployed out of the box or can be flexibly configured to meet specific organizational requirements. "Prepackaged and configurable" means that rules and activities are created and packaged in a way to support the processes mentioned above, including all document and status associations.

Other Core Elements

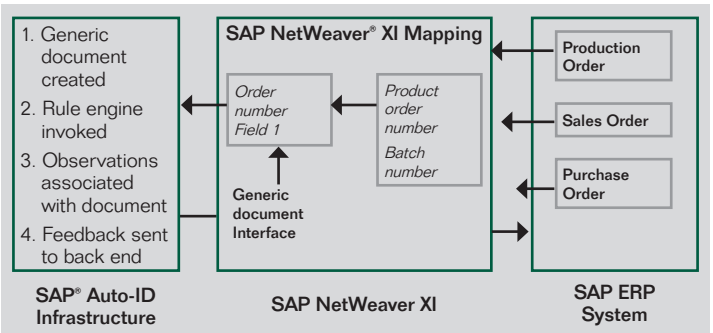
Other core functionality included the following:

- **Serialized number and format management** – Supports encoding and writing RFID tags, including Gen 2 RFID tags
- **Operational or perpetual database** – Stores site-level EPC serialization data and associated observation and event data, multilevel data aggregation, and associated business data. This repository integrates with the object event repository (see next section) and can be used to facilitate local reporting.
- **Integration with business planning and execution applications via SAP NetWeaver XI** – Supports preconfigured integration with SAP ERP, as well as the ability to integrate to non-SAP back-end enterprise resource planning (ERP) applications
- **Analytical reports** – Predefined content for the SAP NetWeaver Business Intelligence (SAP NetWeaver BI) component allows for the tracking of a range of critical key performance indicators (KPIs) such as tag read and write statistics or supply chain metrics including cycle times and dwell times.

Functionality

SAP Auto-ID Infrastructure features a number of important enhancements:

- Service enablement of numerous SAP Auto-ID Infrastructure services to facilitate the development of customized processes that leverage serialization
- Support and integration for the SAP object event repository, SAP enterprise EPCIS technology (see *SAP Object Event Repository* section below)
- The generic document interface, which enables easy integration of ERP and other legacy systems' documents with SAP Auto-ID Infrastructure for the enablement of serialized processes beyond the standard documents
  - With this tool (see Figure 4), it is possible for the customer to set up configuration to facilitate the download from the ERP system into the auto-ID infrastructure (via SAP NetWeaver XI) of any standard business document, without the need for customizing.



Flexible document integration enables the creation of generic documents in SAP Auto-ID Infrastructure and maps associated observations to trigger feedback to SAP ERP

Figure 4: Integration Using the Generic Document Interface

- RFID integration with the SAP Extended Warehouse Management (SAP EWM) application (part of the SAP Supply Chain Management application), covering the following processes:
  - RFID in inbound, including ASN handling, unloading, inbound delivery, and put-away
  - RFID in outbound, including picking, handling-unit processing, packing, staging, loading, goods issue, and outbound delivery
  - RFID with resources, including warehouse task creation, open, and confirmation, based on RFID scans

SAP Object Event Repository

The SAP object event repository is an enterprise-level serial number repository for serialization standards such as EPC, UID, and others. Together with SAP Auto-ID Infrastructure, this repository is intended to be the system of record for all enterprise serialized information. The object event repository is based on the core requirements specified by EPCglobal, including the EPCIS capture interface and the EPCIS query interface.

The object event repository landscape, shown in Figure 5, consists of an enterprise-level repository for uniquely identified objects such as EPC and UIDs. It also features a rich services layer to provide business context, discovery, event capture, and data exchange for these objects, supporting EPCglobal requirements.

The main elements and features of the object event repository are the following:

- Capture and query interfaces based on the EPCglobal EPCIS specification
- Data repository for events, observations, hierarchies, and associated business information
- Event processor, which maintains each serialized object as an event handler in order to track its entire life cycle and enables the configuration of alert notifications if a process does not execute as expected
- Central number-range management to distribute valid and unique EPC number ranges to each instance of the auto-ID infrastructure, from which they can be distributed down to edge devices
- Functionality for tracking and tracing of business objects and processes within and beyond enterprise boundaries
- Functionality for setting up alerts and exception management scenarios (through the SAP Event Management application) to track events such as early, late, or missed deliveries
  - Each EPC number is automatically modeled as an event handler that can be tracked through the full life cycle of the EPC.
- Analytics functionality, including predefined content for SAP NetWeaver BI, which allows for the tracking of a range of critical KPIs such as tag read and write statistics or supply chain metrics including cycle times and dwell times

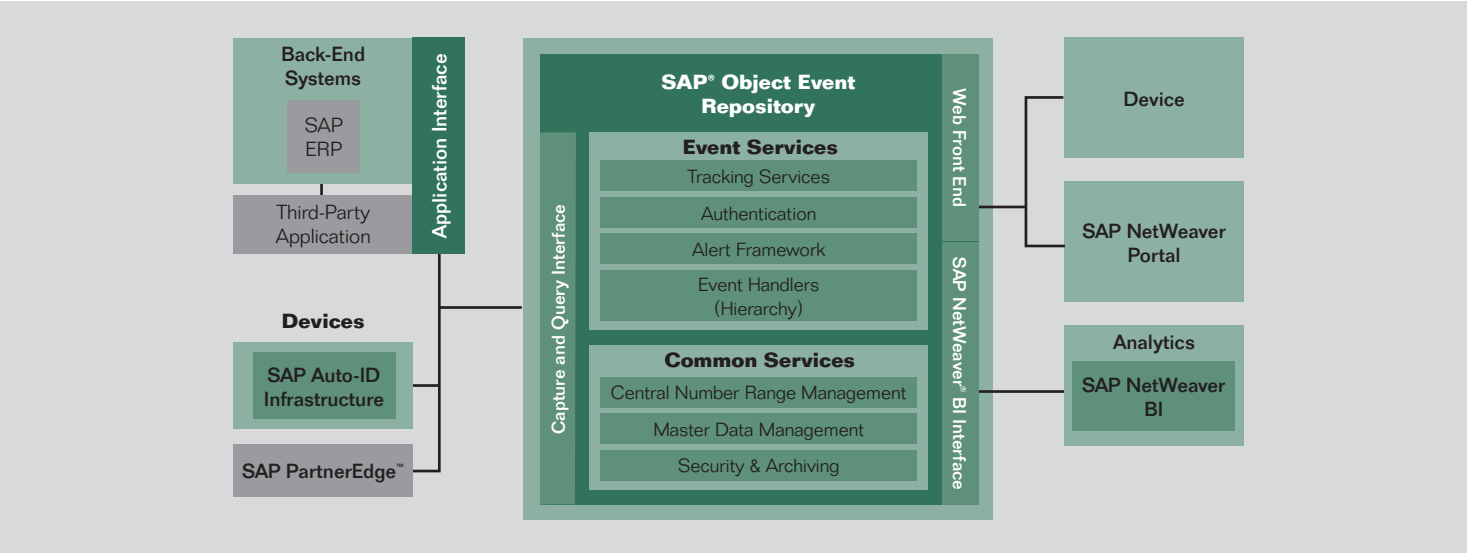


Figure 5: SAP Object Event Repository Landscape

LICENSABLE OFFERINGS

SAP solutions for RFID are flexible and adaptable to meet different deployment needs. Organizations are at different stages of RFID and serialization initiatives. Some are engaged in local, often mandated deployments, while others are seeking business transformation through enterprise-wide deployments.

SAP understands organizations' diverse deployment needs and offers two distinct technology licensable offerings:

SAP Auto-ID Enterprise

SAP Auto-ID Enterprise supports enterprise-wide deployment of business processes. It comprises SAP Auto-ID Infrastructure and the SAP object event repository, supports EPCIS and other industry standards, and includes software configuration that enables a multitude of business processes. The SAP object event repository provides highly scalable, object-level event processing throughout the supply chain. It enables discovery, tracking, reporting, and integration with business systems and enables business processes such as product tracking and authentication.

SAP Auto-ID Infrastructure

SAP Auto-ID Infrastructure supports deployment at individual or local sites and enables organizations to integrate real-world and uniquely serialized data into their business software. SAP Auto-ID Infrastructure comes with preconfigured business processes such as RFID-enabled inbound and outbound logistics and returnable transport items processing.

SAP RFID PARTNER ECOSYSTEM

SAP has the industry's deepest business process expertise and domain knowledge, which is reflected in the applications we offer. While SAP provides the applications, we rely on the expertise of our partners to provide other pieces of the value chain. SAP has cultivated a rich ecosystem of partners. Together with them, SAP provides a complete and robust end-to-end solution. SAP partners in this area fall into the following categories: device management, independent software vendors (ISVs), and system integrators.

Device Management

Although SAP solutions are device-agnostic, SAP partners with device vendors to provide customers an integrated end-to-end solution. In addition, SAP collaborates with leading device middleware vendors that provide connectivity to a large range of devices such as RFID readers of varying frequencies, sensors, printers, and so forth.

SAP has published integration protocols for fixed and mobile devices (*SAP Auto-ID Infrastructure – DC 1.0* for fixed devices and *SAP Auto-ID Infrastructure – Mobile* for mobile devices). In addition, SAP has established a standard certification program for our device management partners through SAP Integration and Certification Center (SAP ICC) location.

For a complete list of certified partners proficient in auto-ID device and device controller technology (as known as device middleware), please visit www.sap.com/partners/directories/SearchSolution.epx and look under *AII-DC-RFID 1.0 – Auto ID Infrastr. Device Controller 1.0.*

Independent Software Vendors

ISV partners provide value-added solutions to SAP software. SAP has a number of certified ISV partners for auto-ID and RFID. In general, ISV certification is a two-level process. The first step is to achieve "Powered by SAP NetWeaver" product certification. Partners work with SAP to move to the next level, which is to develop and deliver an application (an SAP-certified composite application) built on the SAP NetWeaver technology platform.

The list of ISV partners continues to grow as partners build innovative new applications. The latest partner status information can be found on our corporate Web site at www.sap.com/partners/directories/searchpartner.epx.

System Integrators

SAP has a large number of system integration partners who are trained and experienced in implementing SAP solutions for RFID. SAP provides solutions and applications, while system integrator partner make the implementations successful. Our system integration partners provide industry expertise, deep technical skills, and relentless support. With the help of these partners, SAP has been instrumental in delivering very successful auto-ID deployments to our many satisfied customers.

A complete list of SAP's trained and experienced system integrator partners can be found at www.sap.com/partners/directories/searchpartner.epx.

Together, SAP and its partners, provide comprehensive solutions and have repeatedly delivered impressive results. The strength of these partnerships has helped generate customer confidence in this emerging solution space.

SUMMARY

As auto-ID technologies mature, many industries are identifying new and innovative ways to capture business value, improve supply chain and asset management, and ensure compliance, by leveraging these technologies and uniquely identified data.

Some of the key innovations that are unlocking with auto-ID and RFID are around automation and the ability to associate uniquely identified data with business data from their other business systems. In almost every situation, the capture of the unique serialized data is only the first step in a business process in which the serial number information must be linked to other business information to achieve the desired objective. For example, in a customer-return scenario, the serial number of the returned product must be linked to the original invoice information to determine the correct credit amount. In a promotions management scenario, the locations of promotional items in the supply chain must be compared with information about the dates and locations of the planned promotion, to highlight any discrepancies.

SAP solutions for RFID are architected to capture and store this very granular serialized data. We believe that serialized data captured and stored in the object event repository will be of strategic value to our customers.

As you begin to undertake these initiatives, it is important to make these investments with an eye toward laying a long-term foundation that meets not only your current needs but optimizes future innovations as well. SAP solutions for RFID are designed as a solid foundation. You can start small and easily grow from local deployments to enterprise-wide deployments, protecting your investments as you go. SAP solutions support the item serialization necessary to comply with EPCIS and DoD mandates.

SAP has deep expertise in business processes and deep knowledge of RFID and serialization. SAP has more than 30 years of industry experience and a diverse, growing customer base. SAP solutions for RFID reflect this strength, providing preconfigured software that supports crucial business processes such as product tracking and authentication. With these solutions and with the help of our partners, organizations can drive business value by leveraging RFID and serialization across the enterprise.

For more details and customer success stories, please visit us at www.sap.com/rfid.

www.sap.com/contactsap

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