

data sheet

RFID IN ORACLE 11i10 E-BUSINESS SUITE

Radio Frequency Identification (RFID) is gaining momentum with numerous initiatives in the manufacturing and supply chain spaces. Both the US Department of Defense (DoD) and Wal-Mart are proceeding with RFID compliance programs that began in late 2004. Whether RFID adoption is required by your customers or is driven internally by its promise of improved efficiencies, RFID support from your applications will be a key component to any implementation. Oracle provides out-of-the-box RFID support in Oracle Warehouse Management (WMS) with the 11i10 release, and is engaged in several development activities to RFID-enable even more applications in the E-Business Suite. This utilizes RFID middleware support through Oracle Sensor-Based Edge Services, which is delivered as a part of Oracle Application Server 10g. These investments by Oracle are designed to protect your investment in your Oracle E-Business Suite system as the requirements for RFID capabilities increase. Oracle Warehouse Management is part of the Oracle E-Business Suite, an integrated set of applications that are engineered to work together.

Oracle Warehouse Management with Application Server 10g

Built-in, not Bolt-on Functionality

While there has been some recent progress in establishing standards for RFID, there are still many different and incompatible technologies in use and under development, affecting all of these areas. Middleware acts to insulate applications from these various hardware technologies while these standards change and evolve.

3rd party middleware solutions that address this niche requirement will have inherently higher risks and costs as compared to solutions that are integrated into an overall strategic information architecture. As a result, Oracle has added RFID and sensor support (known Oracle Sensor-Edge Services) as a standard component of Oracle Application Server 10g. This eliminates the need for customers to utilize 3rd party RFID middleware.

The customer may choose to deploy this capability with the same instance that is used to support the business application, or may deploy this as a separate instance or instances specifically for support of RFID transactions. This allows the user to decouple the implementation of Oracle Application Server 10g for RFID support, from the version of Oracle Application Server used for the business application (e.g. the Oracle E-Business Suite).

Scalable and Robust Middleware with the Oracle Sensor Edge Server

RFID has the potential to create an explosion of data that could overload even the most robust networks, databases, and ERP systems. This is caused by the increased frequency (down to continuously) and increased granularity (down to individual item instance level) at which

transactions may be triggered. In addition, RFID reading technology can often generate multiple, spurious reads of a single RFID tag as it passes through a portal. While some of these can be filtered by the actual hardware, other filtering requires a business-aware middleware component to intercept these reads before they reach the network. This allows for only valid business events to be passed to the applications.

All RFID Implementations need to address these requirements, but the cost of doing so will increase with the number of different components that must be integrated. A better solution is to have an integrated functional and technology solution so that you can easily support:

- Open RFID Driver Framework – An open framework that allows the installation of drivers for different RFID readers. The RFID Driver Framework also has integration points for drivers to integrate their monitoring functions.
- RFID Reader Drivers – Out-of-the-box drivers for leading RFID readers in the market.
- Data Filtering – Filters are applied at the driver level to ensure data integrity and to reduce the amount of data that need to be handled by the network and the application. Businesses can further refine these filtering rules.
- Data Management – Data is normalized to a standard format, stored in the database and routed reliably and securely to the applications
- Messaging Framework – A reliable, secured message framework that guarantees delivery.

All this is provided in a robust framework with the same reliability, scalability, and security aspects of the Oracle Application Server 10g. No middleware or “Savant” or extra pieces of software are required.

RFID-Initiated Transactions in Oracle WMS 11i10

Oracle WMS provides as standard functionality the ability to leverage RFID tags applied to pallets and cases to perform “hands free” shipping and receiving. This provides much greater value than merely using an RFID tags as a simple replacement to manually scanning barcodes. This eliminates most, if not all, of the manual user interaction with the system, increasing labor efficiency.

To support these automated business flows, Oracle WMS leverages the reader-agnostic and filtering framework provided by AS 10g to receive cleansed data from any RFID reader. As the RFID tags typically contain only a “dumb” identifier to keep their cost low and to comply with standards, Oracle WMS automatically infers the transaction to perform – shipping, receiving, loading, delivery – from the last known position of the tag, the transactions supported at the location where the tag was read, and other related data.

After inferring the transaction, Oracle WMS then completes the standard validation, and performs the transaction. As feedback to the operator is more restricted that with a traditional user interface, flexible response options such as warning buzzers, lightstacks or automatic diversion on a conveyor, are supported through tight integration between Oracle WMS and AS 10g.

EPC Generation Capability

Oracle also provides an RFID / EPC Enabler that can be tied into Oracle WMS to ensure compliance with the RFID mandates. EPC, or Electronic Product Code, is a standard defined by the EPCglobal group of UCC.EAN. EPC can be thought of as the digital or RFID equivalent of a UPC in that it uniquely identifies the manufacturer and product number. But EPC goes one step

beyond UPC in that it also identifies the specific instance of the product, so that each can of soda, for instance, has a unique EPC, even though they all have the same UPC.

Retailing giant Wal-Mart, grocer Albertsons, the U.S. Department of Defense, European retailers Metro and Tescos, among others, have all indicated they expect their suppliers to tag pallets and cases, and in some scenarios, individual items, with EPC-encoded RFID tags by various dates, starting as early as late 2004.

Oracle's RFID / EPC Enabler can be used alongside Oracle WMS 11i10, or even earlier releases of Oracle Applications and other legacy systems. This helps you quickly and easily meet the mandate of printing EPC-compliant labels, and then later optionally verifying that the pallet has been correctly built and that there are no missing or extra cases or items. The RFID / EPC Enabler leverages the same AS 10g RFID and sensor technology stack, so it can easily grow with you as your needs expand beyond simple "slap-and-ship".

Statement of Direction

Fully Integrated RFID Compliance

Oracle will introduce completely integrated EPC support, so that EPCs can be easily generated as part of the standard WMS label printing routines as part of the manufacturing, receiving, packing, or consolidation operations, or indeed, at any point at which WMS already supports label printing.

In addition, the EPCs associated to particular LPNs or serials will be able to be quickly viewed, and easily regenerated if an RFID tag becomes damaged or turns out to be defective. And the way in which EPCs are generated will be easily modifiable by qualified users to ensure that you can respond immediately to any change in the EPCglobal – or competing – standards without expensive application upgrades or consulting services.

Additional Transactional Flows in E-Business Suite

As RFID technology matures, additional business flows will be enabled for WMS and other Oracle applications. These may include enhanced inbound and returns processing for both returned product and returnable assets, enterprise asset management, automated cycle counting / physical counting, sub-inventory transfers, picking execution, and assembly genealogy tracking. Some of these flows rely on item level tagging to realize their full potential, and thus will rely on the availability of very low cost RFID tags for them to deliver adequate ROI. However, as many of these flows are intra-organization, they do not require, though they may benefit from, industry-standards such as the EPC.

EPC & the Challenges to Inter-Organization Flows

However, the full promise of RFID will arrive with widespread adoption of RFID technology and a common object numbering scheme like EPC. Because EPCs are globally unique, they are somewhat analogous to the URL of the Internet. This identifier can be resolved through a network lookup using methods analogous to the Internet's Domain Name Service (DNS). This capability is sometimes referred to as an "Object Name Service" or "ONS". Using this technique any relevant information regarding the item can be made available to any authorized, interested parties at any

point in the supply chain, in a variety of formats - most likely based on variants of XML – through services called EPC Information Services, or EPC IS.

Together, these developments will create a paradigm shift in supply chain processes, which will create both opportunities and challenges. On the challenge side the huge volume and increased granularity of transactions will require that business systems have a highly scalable technology infrastructure. It will also force changes in how events are detected, subscribed to, and serviced.

While these technologies are often not required to make these capabilities possible, together they create a window of opportunity that will act to accelerate adoption. The timeframes for each will be largely determined by the costs and challenges associated with deployment. In this regard, users of the Oracle E-Business Suite and the associated Oracle technology products will be uniquely positioned to exploit and benefit from these developments.

Scan-based Trading & VMI

With Oracle Collaborative Planning, VMI and consignment flows are fully automated, whereby a supplier can deliver material directly to the manufacturing line or shelf, and receive payment and automated messages for replenishment as the material is actually consumed. But an inhibitor to VMI is lack of detailed, granular information, and a definitive process to identify the owner of any shrinkage.

RFID-verified processes helps to resolve both problems, by enabling full confirmation of the delivered product by the customer, without incurring an incremental cost to the customer to manually verify the suppliers' product that would cut into the value provided by VMI. And every product removed from the vendor-managed shelves – regardless of ownership – is recorded for RFID, whether or not it is for a legitimate use.

Real-Time Planning & Exception Management

The increased timeliness and accuracy of information (and the associated increased level of control that can bring) will facilitate the adoption of business processes such as dynamic re-routing. In concert with a decreased planning window in general, businesses can begin to react real-time to changing conditions in the supply chain. This in turn will drive the development and use of innovative techniques, such as intelligent agent-based optimization.

For instance, Oracle Transportation Planning and Oracle Advanced Supply Chain Planning may re-direct shipments, based on configurable rules, to replenish a customer running a promotion who has recorded higher-than-expected sales during. Combined with RFID and other location sensor services, such as GPS and RTLS, delays from mis-directed shipments can be identified immediately. Alerts, using SMS messages, and exception management, using voice-activated phone responses to trigger corrective actions, powered by Oracle Application Server 10g, can resolve the problem even before the customer is aware there was an issue.

Closing the Loop

The real value of RFID comes from “closed loop” systems, whether that loop is closed physically by return of the product or asset, or digitally by return of information about that product from a trading

partner. With a closed loop providing multiple data points from a single tag, the cost can be amortized over several business benefits in the supply chain, providing real ROI even as tag costs continue to fall.

Oracle E-Business Suite—The Complete Solution

Oracle E-Business Suite enables companies to efficiently manage customer processes, manufacture products, ship orders, collect payments, and more—all from applications that are built on a unified information architecture. This information architecture provides a single definition of your customers, suppliers, employees and products—all aspects of your business. Whether you implement one module or the entire Suite, Oracle E-Business Suite enables you to share unified information across the enterprise so you can make smarter decisions with better information.

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