



IBM WebSphere RFID Device Infrastructure



Radio frequency identification (RFID) is an enabling technology with the potential to streamline, automate and transform the way business is done in many different industries. For example, manufacturers are using RFID tags to monitor the movement of products during shipment. Retailers are using RFID tags to track merchandise in their supply chains. Tags can be attached to cartons and pallets and affixed to products such as food, drugs, parts and equipment, allowing retailers and manufacturers to replenish inventory in real time, rather than relying on forecasts from previous years.

Highlights

- ***Integrates data from a variety of RFID readers and printers, isolating upstream domains from unique RFID device and equipment interfaces.***
- ***Performs data filtering close to the readers, reducing network traffic, and integrates printers with WebSphere RFID Premises Server functions.***
- ***Robust messaging platform assures reliable delivery and persistence of RFID data and events to business applications.***
- ***Security-rich, reliable platform helps to ensure continuous performance.***
- ***Enabled for remote software distribution.***

IBM RFID solutions support an incremental approach for the adoption of the technology into a business environment and provide components that are designed for scalability and future growth. IBM's RFID middleware technologies include a complete and scalable infrastructure for pervasive edge devices, allowing users to perform much of the needed RFID function prior to reaching an RFID server located at the premises or the enterprise IT systems.

IBM's RFID middleware technologies include assured message delivery function, scalable and robust data

Table 1: IBM WebSphere RFID Device Infrastructure

Readers, scanners, printers	<ul style="list-style-type: none"> • <i>Gather product data on the facility floor, print data to tags for shipping.</i>
Edge domain	<ul style="list-style-type: none"> • <i>OEM-embedded software installed on RFID controllers, readers, printers.</i>
IBM WebSphere RFID Premises Server	<ul style="list-style-type: none"> • <i>Premises domain: Platform for RFID-enabled applications aggregates and analyzes data from the devices.</i>
IBM WebSphere Business Integration	<ul style="list-style-type: none"> • <i>Business process integration: Integrates RFID-enabled business processes with line-of-business applications.</i>
Enterprise and business application domain	<ul style="list-style-type: none"> • <i>Line-of-business applications and functions that integrate with IBM WebSphere Business Integration products.</i>

management and reconciliation technologies, industry-leading enterprise application integration, and pre-built process automation templates and tools for clients implementing RFID in their business applications. The IBM WebSphere® RFID Device Infrastructure can be used with printers, readers and controllers at remote locations such as stores, dock doors, manufacturing sites and distribution centers.

IBM RFID Solution Architecture

The IBM RFID Solution Domain Architecture provides flexibility and scalability to maximize business value capture, grouping logically related technology components, supporting evolving standards such as EPCglobal and ISO, and insulating layers of technology advancements through loose coupling of, and flexible and clean interfaces between, domains. The IBM RFID Solution Domain Architecture includes five main tiers: Reader, Edge, Premises, Business Integration, and Enterprise Applications. The Device Infrastructure implements the Edge tier of the architecture.

IBM WebSphere RFID Device Infrastructure

The Device Infrastructure supports basic functions for RFID event collection and reporting, providing the following capabilities at the “edge” of the network:

- *Integration of data from a variety of RFID readers, isolating all upstream domains from unique reader and equipment interfaces*
- *Filtering and aggregating RFID data, eliminating duplicate data and identifying RFID events, reducing network traffic*
- *Delivery of RFID events to the IBM WebSphere RFID Premises Server using a messaging and event buffer*
- *Integrating with IBM WebSphere RFID Premises Server to print RFID tags*
- *Providing software distribution management*

These capabilities are delivered by products integrating the Device Infrastructure into their RFID devices, such as RFID controllers, intelligent RFID readers and RFID printers. These devices would typically be located in stores, warehouses, and factories where RFID-enabled operations – such as shipping and receiving and asset monitoring or management – are performed.

Detailed description*1. Data Integration and printing*

The Device Infrastructure integrates data from a variety of RFID readers, printers and other devices.

It should be noted that the WebSphere RFID Device Infrastructure now supports manufacturers' protocols, instead of supporting individual device

models. By supporting the protocols rather than specific device models, IBM is better able to insulate against disruption as device manufacturers introduce new models. Table 2 shows the different protocol levels that the Device Infrastructure supports. Also listed is a sampling of the supported models that use the given protocols. For a complete list of supported device models, please contact the device manufacturer whose products you are interested in using.

The Device Infrastructure is built on a modular, open-standard OSGi platform, and includes tools to make it easy to add support for additional RFID printers, readers and other digital I/O devices. Support for additional devices can also be delivered through IBM Global Services.

Table 2: Protocol levels supported

Protocol supported	Vendor	Device model examples
ALIEN Alien Long Range	Alien	Alien ALR-9780, ALR-9800
FEIG Feig OBID i-scan Proximity Reader	Feig	Feig ISC PR100
FEIG Feig OBID i-scan Long Range UHF	Feig	Feig ISC-LRU1000
INTERMEC Basic Reader Interface	Intermec	Intermec IF5
SAMSys Comprehensive Heuristic Unified Messaging Protocol (CHUMP v6.0)	SAMSys	SAMSys MP9320 EPC 2.7 and 2.8
SYMBOL Byte Stream Protocol	Matrics & Symbol	Matrics AR400, Symbol XR400
TAGSYS STX Extended Version 2 (STX-E)	Tagsys	Tagsys Medio L100, L200
PRINTRONIX Printronix Graphics Language (PGL)	IBM and Printronix	IBM InfoPrint 6700, Printronix SL5000e & SL5000r
PRINTRONIX Printronix XML (PXML)	Printronix	Printronix SL5000r
ZEBRA Zebra Programming Language (ZPL)	Zebra	R110Xi III Plus



Hardware requirements

IBM WebSphere RFID Device
Infrastructure V1.1

- *CPU: Intel® xScale (PXA255 or similar)*
- *ROM: 64MB*
- *RAM: 32MB*

2. Filtering and aggregation

Filtering of RFID events in the Device Infrastructure supports three kinds of filters:

- *Temporal filtering: Duplicates of events in a period of time are filtered out, so that only one of these events is reported to any higher level software component.*
- *Pattern filtering: Only events that match a certain pattern are reported to any higher level software component.*
- *Custom filters can also be developed using the code samples provided.*

3. Remote software distribution management

Once the hardware and associated wiring are installed, the software to communicate with a reader can be remotely downloaded to the Device Infrastructure from a central system management server, installed and activated. Parameters associated with the reader can be queried and manipulated.

Summary

The IBM WebSphere RFID Device Infrastructure supports multiple RFID reader devices and printers and provides early filtering to minimize network overload. Combined with the IBM WebSphere RFID Premises Server offering, scalability is ensured with additional filtering and correlation of RFID events, enabling integration of RFID event data with enterprise applications. The multi-tiered IBM RFID Solution Domain architecture provides flexibility and scalability to maximize business value capture.

For more information

To learn more about IBM Sensor and Actuator solutions, visit ibm.com/solutions/sensors.

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Somers, NY 10589
U.S.A.

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