

SYBASE®

SYBASE RADIO FREQUENCY IDENTIFICATION (RFID)
TECHNOLOGY ARCHITECTURE

THE UNWIRED ENTERPRISE.





A COMPREHENSIVE TECHNOLOGY INFRASTRUCTURE THAT:

- Integrates RFID into the enterprise by enabling organizations to rapidly add RFID data, devices and processes to their existing infrastructure
- Combines best-of-breed technologies to reduce the cost and complexity of deploying and managing RFID solutions
- Aggregates and enhances RFID data and delivers it wherever it is needed throughout the extended enterprise
- Lowers Total Cost of Ownership (TCO) through remote device management, visual process modeling and simulation of RFID data and content
- Technology investments can be incremental or subscription-based

THE OPPORTUNITY

For companies with a few to a few thousand varied RFID devices; thousands or millions of RFID, barcode or sensor reads per day; thousands of alert and notification conditions within and outside of the organization—Sybase’s RFID Architecture establishes an infrastructure that automates and simplifies the functionality required to build RFID-based solutions.

Our service-oriented infrastructure platform is based on a “network of devices” which delivers RFID and related data concurrently to multiple applications and processes. This platform leverages the physical RFID network for a variety of uses and addresses business problems such as asset tracking and data exchange between trading partners, regardless of the type of system employed—open or closed-loop. The RFID Anywhere component of the architecture is a middleware/edgware platform that integrates RFID systems with existing enterprise applications, while providing security, management, scalability, extensibility and interoperability.

Sybase’s comprehensive architecture and complementary RFID solution, consisting of modularized plug-and-play Sybase products and serviceware, enables companies to extend, expand and mobilize information from RFID devices throughout the enterprise as determined by an organization’s existing technology investments, immediate priorities and future objectives.

In addition to Return on Investment, regulatory compliance, and mandates from major retailers and government agencies, Sybase firmly believes that ease of use and interoperability will help drive customer adoption of RFID.

DESIGN, DEVELOPMENT, DEPLOYMENT AND INTEGRATION

Managing information assets and boosting information liquidity is critical, but so too is your availability to rapidly deliver critical applications. Sybase development and integration products are innovative, flexible, open and fast. Our RFID Architecture reduces the cost of building, managing and deploying an RFID network and increases the value of enterprise systems by freeing your RFID data and applications, shifting relevant information down to the actual points of action in your organization, and empowering decision makers in ways that simply haven’t been possible before.

SYBASE ARCHITECTURE BENEFITS

The Sybase RFID Architecture is based on open standards that allow you to manage all your RFID assets using just one system. The option to select only those components of the product set that best complement your environment, allows you to maintain your current investment and incrementally build additional components as your needs expand over time.

Sybase can work with you and your partners to develop or assess your RFID strategy, provide a roadmap for implementation, or deliver a complete business and technology solution for you from the ground up.

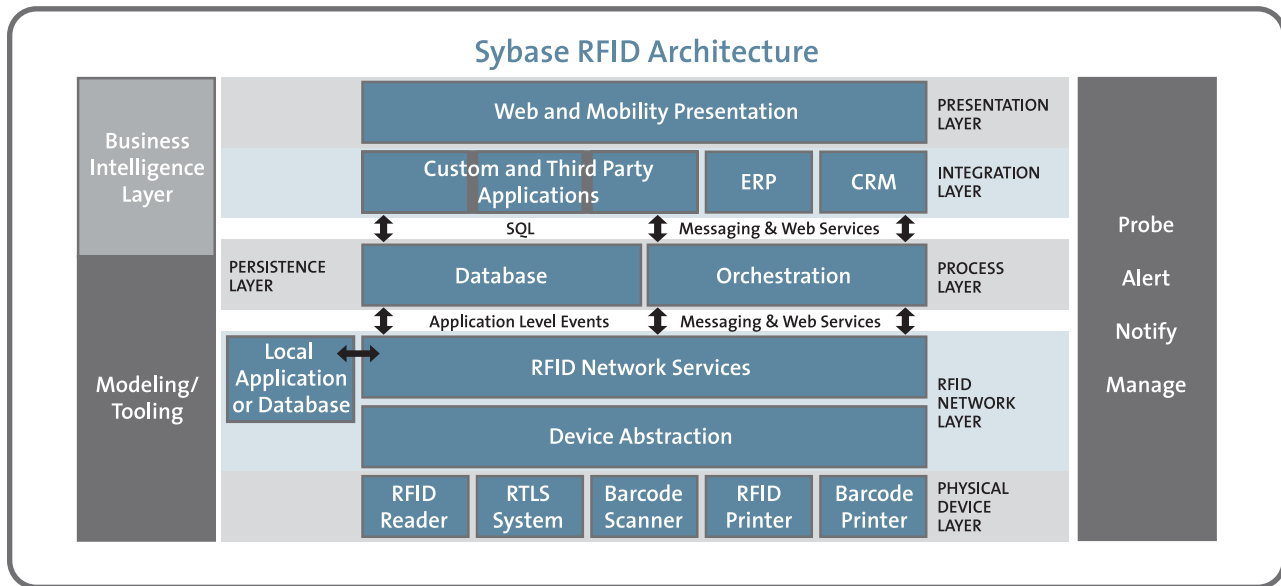
SYBASE RFID ARCHITECTURE—TECHNICAL DESCRIPTION

Data integration and device management is a challenge that most organizations face today when deploying RFID devices. Sybase’s RFID architecture is designed to simplify and automate the development and deployment of passive RFID, active RFID and real-time location solutions,

while addressing common RFID application challenges. Those challenges range from the use of varied RFID devices—such as interrogators/readers, sensors, PLCs and printers; to the integration and management of RFID applications; to back-end business process integration. Sybase meets this challenge by providing the infrastructure and communication services to seamlessly implement an RFID network.

The architecture is composed of middleware/edgware, OLTP database, analytical data store, mobile and Web data management and publishing capabilities. These components provide an end-to-end visual environment for modeling and deploying RFID-based business processes; persisting RFID data into a customized RFID-specific database schema; notifying and alerting based on RFID events and conditions; analyzing RFID data for business intelligence purposes; and mobilizing RFID data to a broad range of mobile devices.

This architecture positions Sybase as a leader and an innovator in this emerging marketplace by combining our integration and mobility expertise with best-of-breed technologies into one comprehensive platform.



THE SYBASE RFID ARCHITECTURE COMPONENTS

The Sybase RFID Architecture is comprised of proven core Sybase products with customized RFID features and new integration technologies and capabilities. It consists of the following components:

The Physical Device Layer consists of the actual hardware and software of the individual RFID devices on the network. These devices can be any number of RFID/Barcode readers/printers and Real Time Location devices. Sybase has formed a number of strategic relationships with RFID hardware vendors to have our solution certified for their technologies.

The RFID Network Layer, implemented through Sybase product RFID Anywhere, is a middleware/edgware platform that supports the reading, writing, filtering, grouping and routing of data generated by RFID readers and related peripherals. It enables enterprises to quickly access, manage and process large volumes of RFID data by subscribing to Sybase’s network services and application level event functionality via messaging or web services. It’s native support of both ISO and EPC standards, as well as incorporation of CIM, LDAP and SOAP standards and protocols provides out-of-the-box integration capabilities with the vast majority of existing and emerging enterprise infrastructures.

- Reduces the time, complexity and cost of developing and managing RFID solutions
- Creates business processes requiring RFID data and RFID alert and notification
- Integrates with external systems through web services and other open standards
- Centralizes management and mobilization
- Converts RFID tag data into a relational format
- Enforces business rules and constraints through availability and tracking of data based on business schema models
- Delivers location-enabled content to mobile devices
- Presents an integrated modeling environment that encompasses business architecture, business process, messaging, and data

This layer also provides the interface to and management of different types of devices—including RFID readers (ISO and EPC), barcode readers, RFID/barcode printers, and related devices. The RFID Anywhere layer delivers robust management of RFID devices, hosts business logic and generates simulated RFID loads and content providing thorough device management and efficient data capture.

The **Process Layer** provides a visual RFID business process development environment for defining business processes that require RFID data and providing real-time integration into existing systems through data mapping, formatting and business rule execution. This component enables the discovery of numerous types of service interactions for automatic invocation during runtime, which include: interaction with web services, databases and multiple types of messaging services; as well as the integration and transformation of XML within this layer.

The **Persistence Layer** consists of a database schema and applications that allow for the creation of RFID “events”. These events are used as a means of identifying which data will be persisted and then provide that data in a simple way via supporting metadata for specific industries and tag types. It includes a data loading approach that supports high volumes of RFID data into a custom designed RFID database schema. Data may be hosted in a variety of common relational databases and accessed by a range of techniques—including standard SQL—by applications built to process the RFID data; positioning the solution to provide enriched data to trading partners.

The **Integration Layer** consists of prepackaged adapters designed to work with specific off-the-shelf applications and standards. These adapters jump-start integration efforts by reducing valuable development time and providing reliable, documented, and configurable connections between applications by enabling them to work with the Process Layer.

The **Presentation Layer** provides the resources within the architecture for synchronizing both data and content with mobile devices so that mobile resources can determine the location of specific objects; perform transactions based on information fed from the RFID network; and specify queries such as “closest” object or “closest object of a certain type”.

The **Modeling/Tooling** component illustrates the capabilities of our products combining several standard modeling techniques—application modeling through UML; business process modeling for analysis, collaboration and execution; traditional conceptual/physical database modeling; and integration process design and definition. The capabilities also include allowing users to work with the XML formatted output published by RFID Anywhere.

The **Probe/Alert/Notify and Manage** capabilities are components of the architecture layers which may be installed and configured to collect information at user-defined tracking points so that message data can be reformatted and sent to people, applications, devices or logs. The subscriptions, alerts, and graphical dashboard capabilities facilitate dynamic monitoring of active business processes.

Finally, the **Business Intelligence** component is used to store historical RFID data in this scalable analytical engine, designed from the ground up for great complex query and reporting performance for analytical requirements.

RELEVANT INFORMATION. MANAGED. UNWIRED.

By leading the industry with software solutions to manage and mobilize the enterprise, Sybase is helping companies uncover new business fundamentals to create value and boost competitive differentiation.

CALL OR CLICK

To learn more about Sybase’s RFID solutions, visit our Web site at <http://www.sybase.com/RFID>.

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