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and

Sybase RFID Anywhere

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RFID Anywhere product goals

- Integrate smart sensors and event-driven data into the Enterprise, both from an information and control perspective
- Provide logic and management to organize smart sensors into intelligent networks
- Real-time data gathering from smart devices
- Layer of abstraction between hardware vendors and protocols
- Easily integrate with external systems through Service Oriented Architecture and standards implementation
- Enterprise/centralised web-based management
- Extensible architecture designed to address current and future business needs

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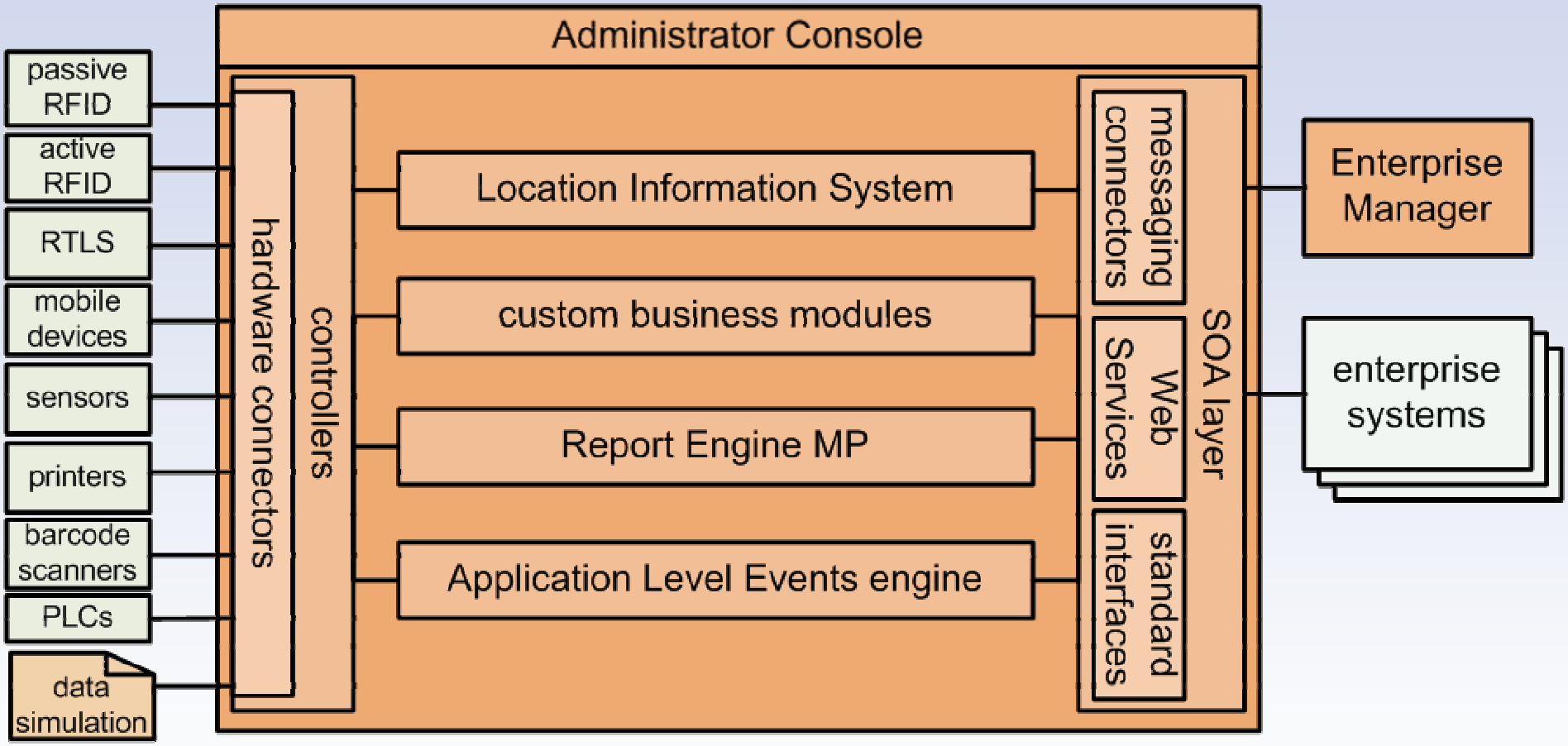
RFID Anywhere...

Software infrastructure that integrates sensor technologies with business logic, to enable the development, deployment and management of highly distributed intelligent sensor networks.

RFID Anywhere Architecture



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RFID Anywhere Key Features

Multi-device support

Both RFID and non-RFID device classes, including mobile devices sensors and location tracking systems

Complete process automation platform

Flexible solution development options

Custom business modules, XML reporting, location mapping

Unique context-aware location tracking solution

Track assets from range of technologies and collection points, plus associate environmental inputs to add value

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RFID Anywhere Key Features Cont..

Enterprise Management

Configuration, monitoring, provisioning across multiple sites

Abstraction of hardware, protocols, data, integration

Allows developers to focus on business applications

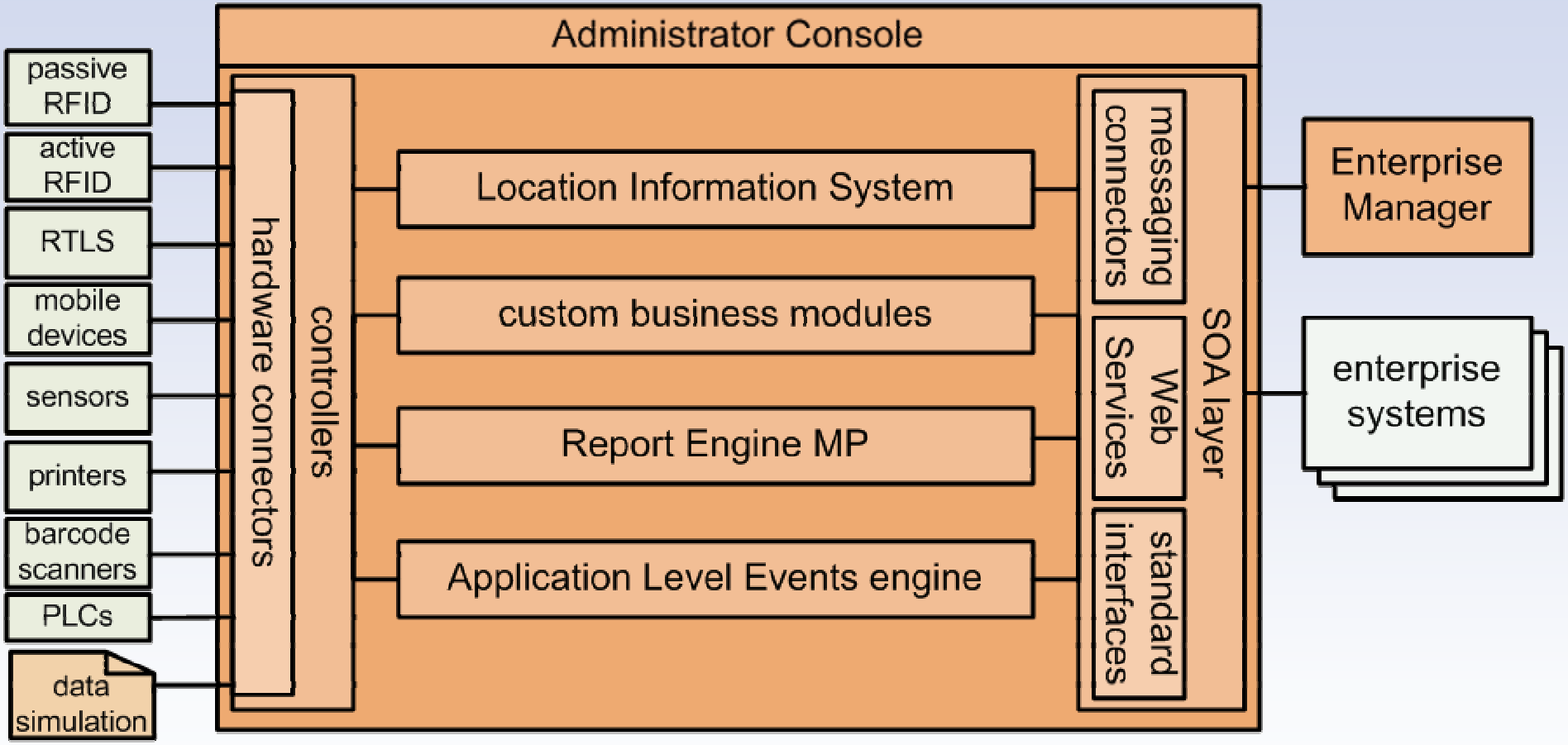
Distributed architecture

Suited for remote, occasionally-connected sites

SOA interface to entire sensor network

Easily integrate with ERP systems through Service Oriented Architecture and standards implementation

RFID Anywhere Architecture



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Hardware: Business Data

- RFID readers
  - Core component in RFID network; transmit raw RFID data received from tags to software
- RFID printers/applicators
  - Write raw RFID data to tags and print labels
- Barcode scanners
  - Barcodes often used in conjunction with RFID
- Mobile RFID readers
  - Bring the reader to the asset (i.e. taking inventory)
- Positioning systems
  - Provide X,Y location data of tagged assets
- Smart sensors (temperature, humidity, pressure)
  - Add additional business context to application, monitor environment of assets (i.e. shipping perishable goods)

Hardware: System Control Data

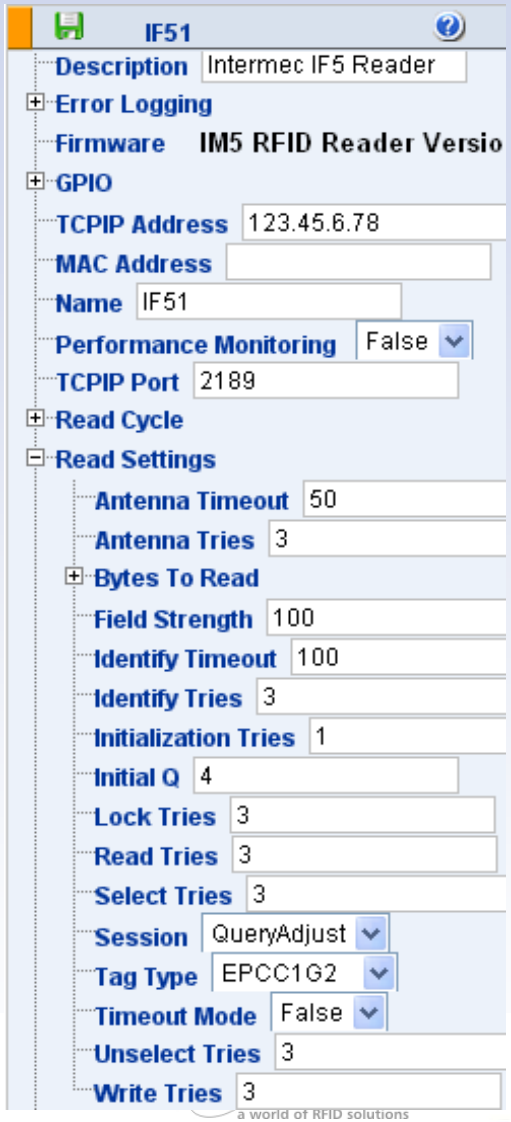
- Proximity sensors (photo eyes)
  - Provide presence information to instruct RFID reader to begin reading
  - Provide direction information
- Programmable Logic Controllers (PLCs)
  - Control and monitor a variety of equipment from one piece of hardware
- LED displays, light stacks, other feedback mechanisms
  - Give visible feedback for status messages, instructions, or error notification
- General Purpose Input/Output
  - GPIO-enabled devices provide a set of Input/Output ports which can be configured for either input or output
  - Attach hardware such as sensors, light stacks, etc.

Abstraction of hardware, protocol, data

- Developers and integrators don't need to learn low level protocols and standards, or proprietary hardware interfaces
  - Provides single API to interact with wide range of RFID hardware
  - Developers focus on creating business logic and value
- Build robust, flexible, future-proof solutions
  - No hardware, standard, or protocol lock-in
  - Support heterogeneous mix of hardware in one application
  - Add hardware or easily upgrade to new hardware

RFID Anywhere Connectors

- Hardware connectors
  - Provide the interface to physical hardware devices
  - Built using the low-level hardware interfaces to communicate with a specific piece of hardware
  - Expose configuration properties, send hardware commands, and receive data from these hardware devices
  - Each specific piece of hardware that RFID Anywhere supports has its own unique connector that can be installed in RFID Anywhere
  - Connectors for a variety of RFID readers, RFID printers, barcode scanners, sensors, mobile devices, PLCs, etc.



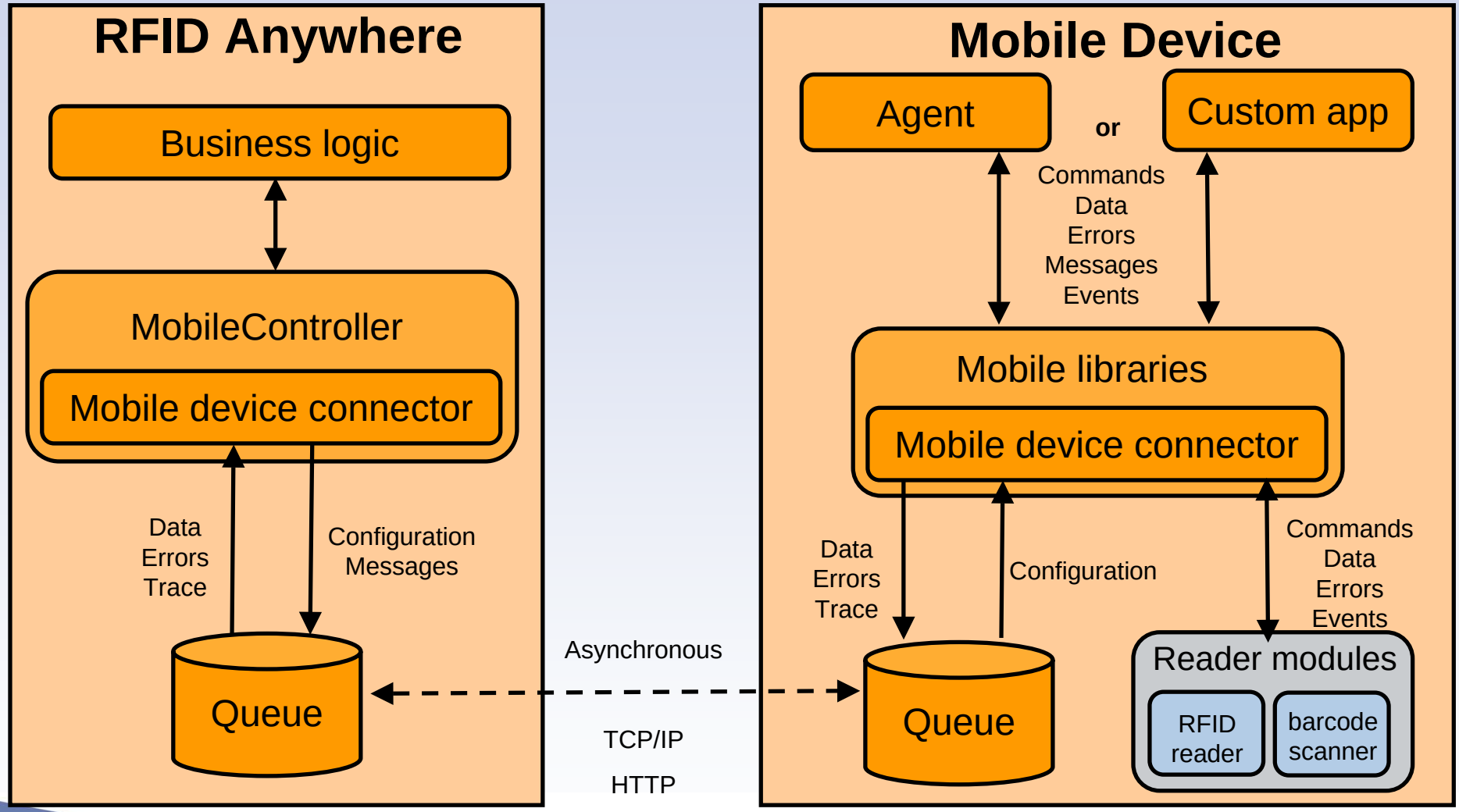
RFID Anywhere Controllers

- Controllers
  - Expose the functionality necessary to support a specific family of devices
  - Functionality exposed by a given controller is common to all devices in the family of hardware that the controller supports
  - Business logic interacts with controllers, as controllers encapsulate the various hardware connectors installed on a system
  - This allows data from multiple different pieces of hardware to be seamlessly aggregated and used by a single application

RFID Anywhere Mobile Device Support

- Integrates mobile devices into RFID Anywhere framework as new device family
  - Event-driven architecture on server and device
- Provides options for application development and integration
  - 1: On-device agent; no device-side programming required
  - 2: Device-side APIs for building .NET CF applications
- Device does not have to be connected to network or server for mobile application to function
  - Data is queued when required, and sent asynchronously

Mobile Device Architecture



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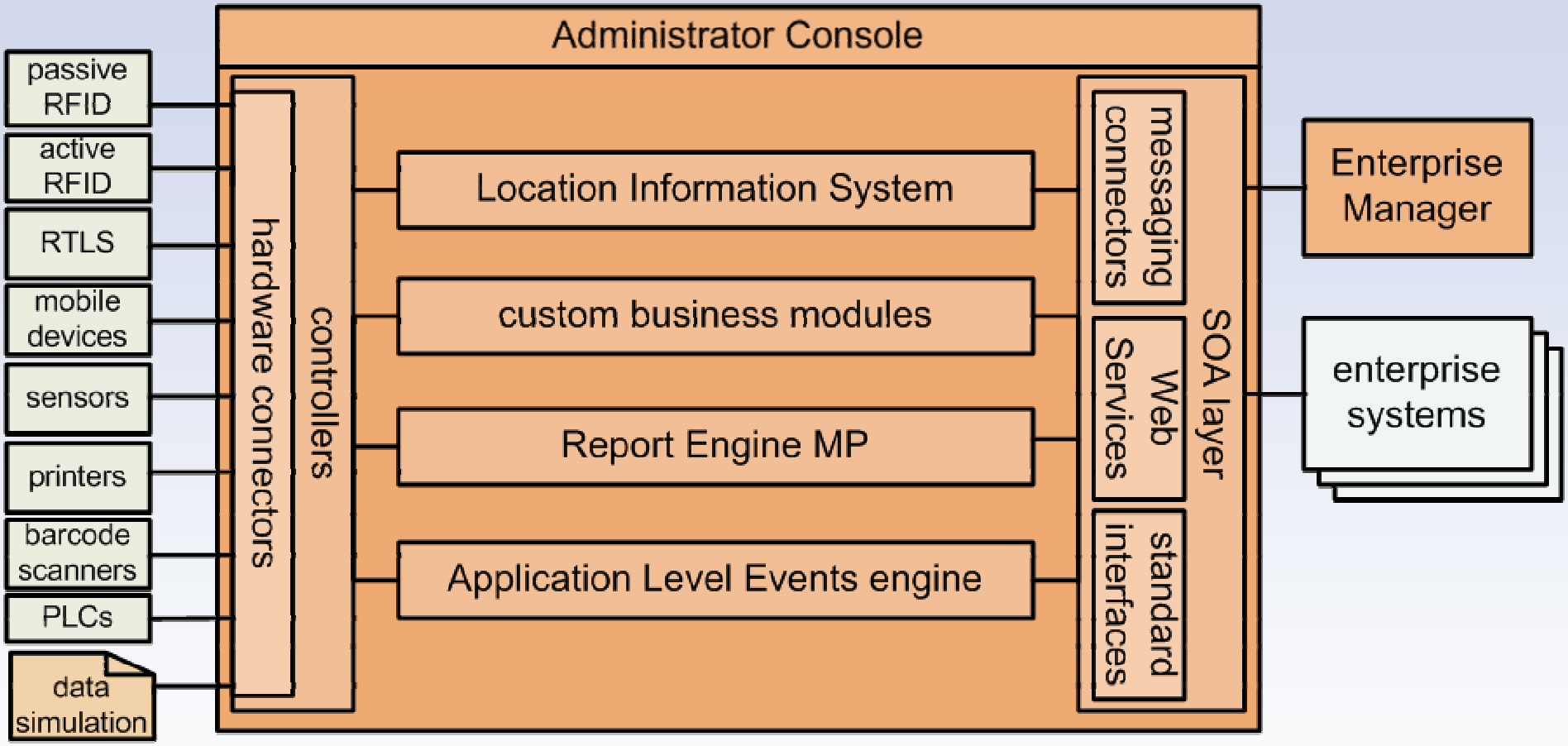
RFID Anywhere Architecture



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Flexible Development Options

- Business Modules
  - Use included Visual Studio extension to create custom logic
  - Handle tag events with the power of .NET
  - Easily interact with other applications or data sources
- Application Level Events (ALE)
  - Generate XML reports on tag activity for EPC tags
- Report Engine MP
  - Generate XML reports on tag activity for EPC, ISO and custom tags
- Web Services
  - Use web services from applications to interact with RFID Anywhere
- Choose from a variety of enterprise integration points to easily deliver processed information
  - JMS, MSMQ, SMTP, SOAP, UDP, TCP, file creation

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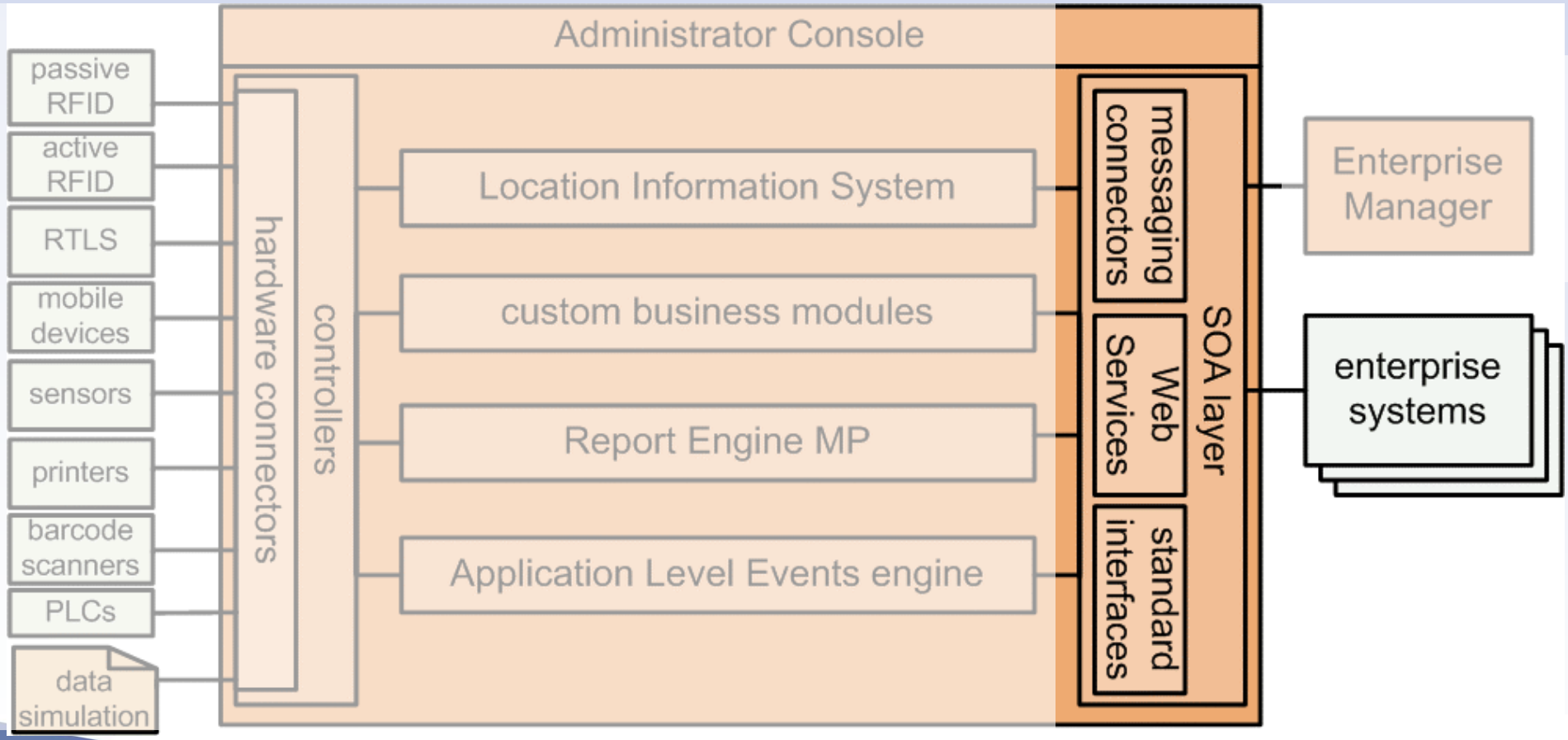
RFID Anywhere Archtecture



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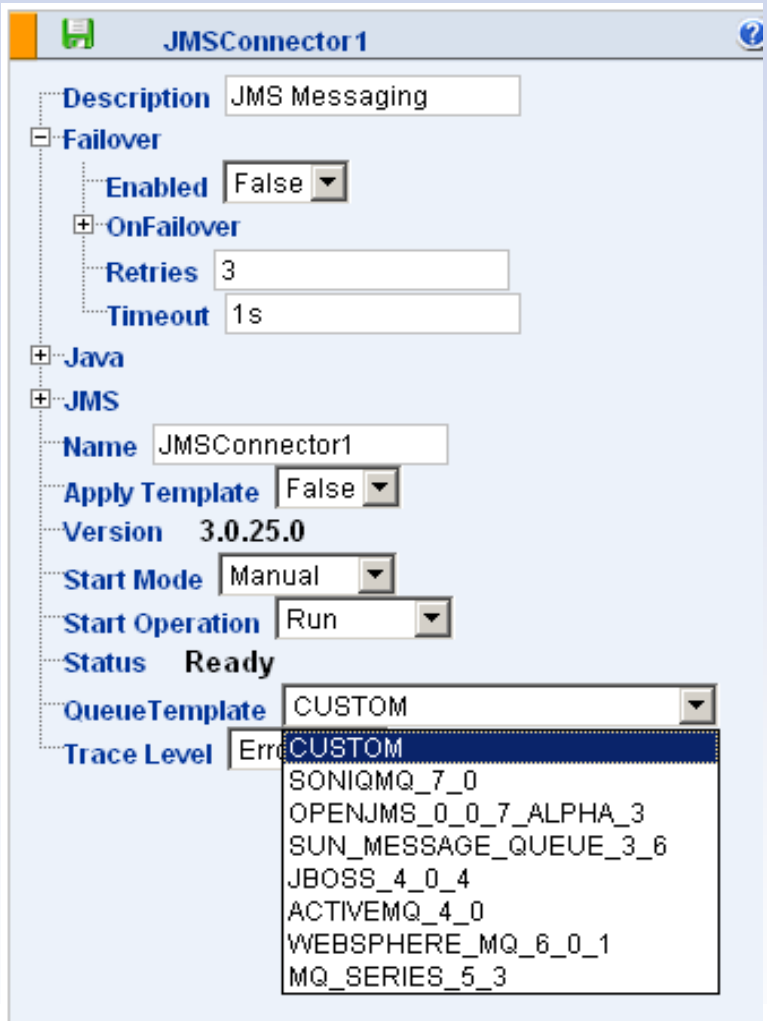
Flexible Integration

- Messaging Connectors
  - JMS
  - MSMQ
  - SMTP
  - SOAP/Web Services
  - UDP
  - TCP
  - file creation
  - SAP AII



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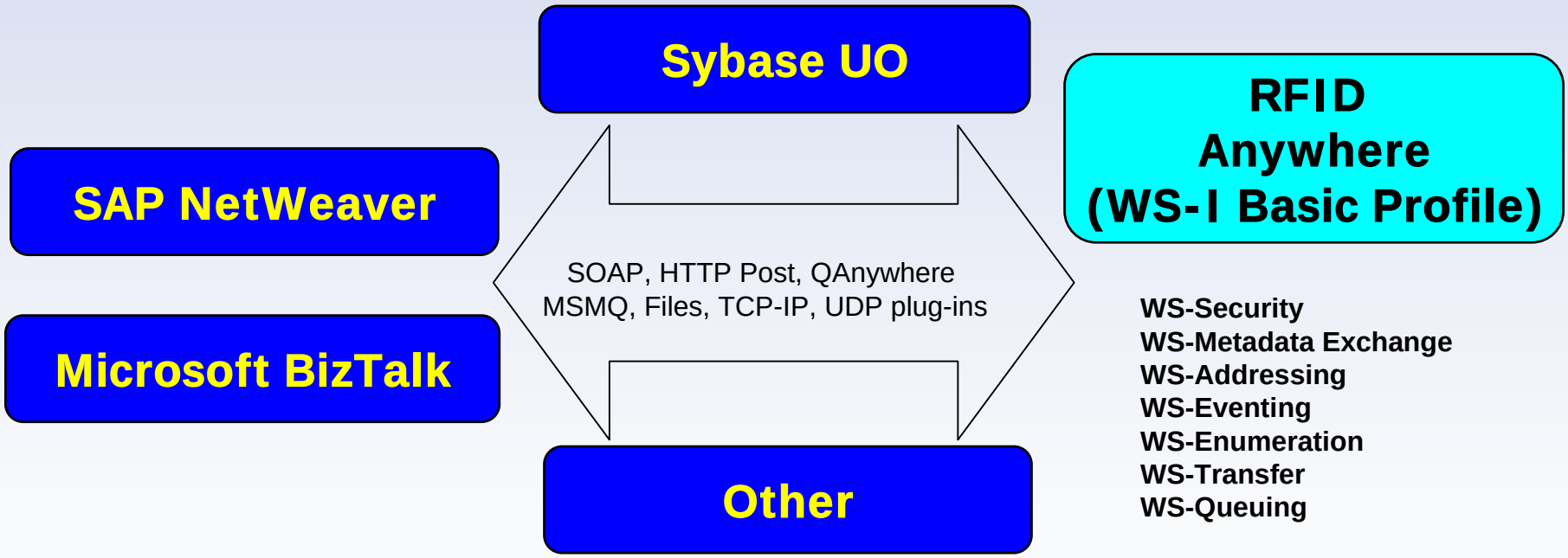
Service Oriented Architecture

RFID Anywhere provides a complete service oriented architecture for integration and access with enterprise applications.



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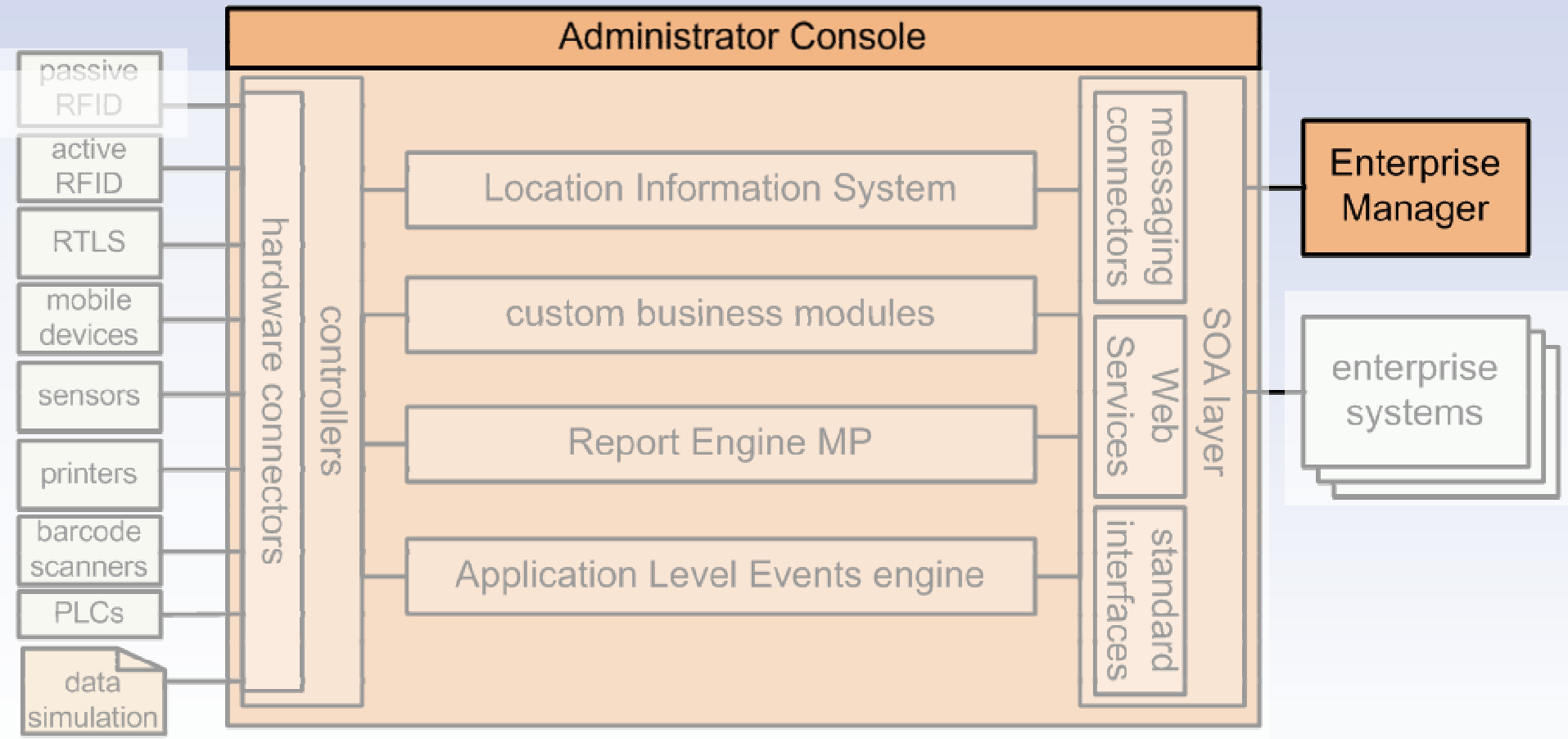
RFID Anywhere Architecture



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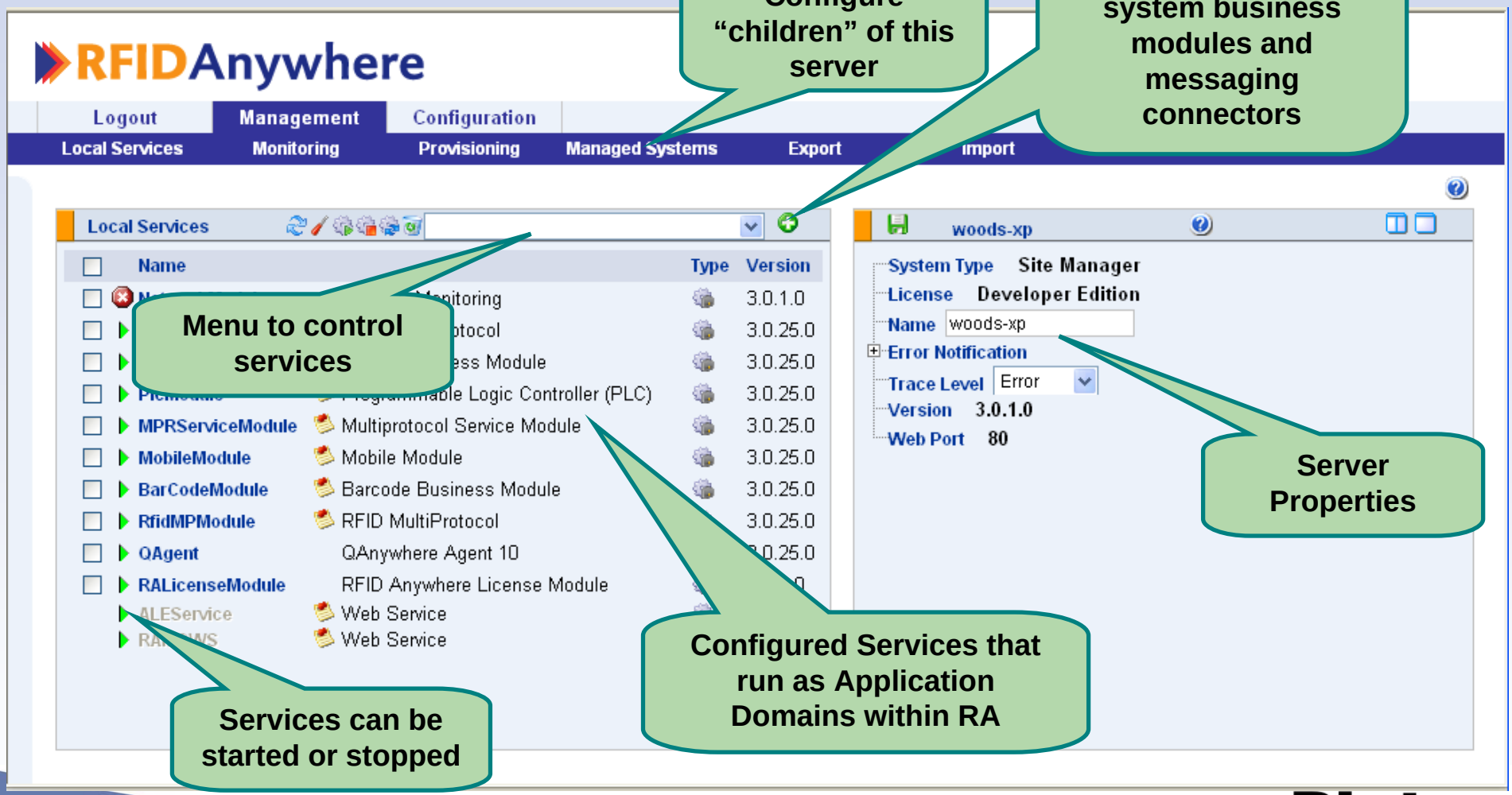
Site Level Management



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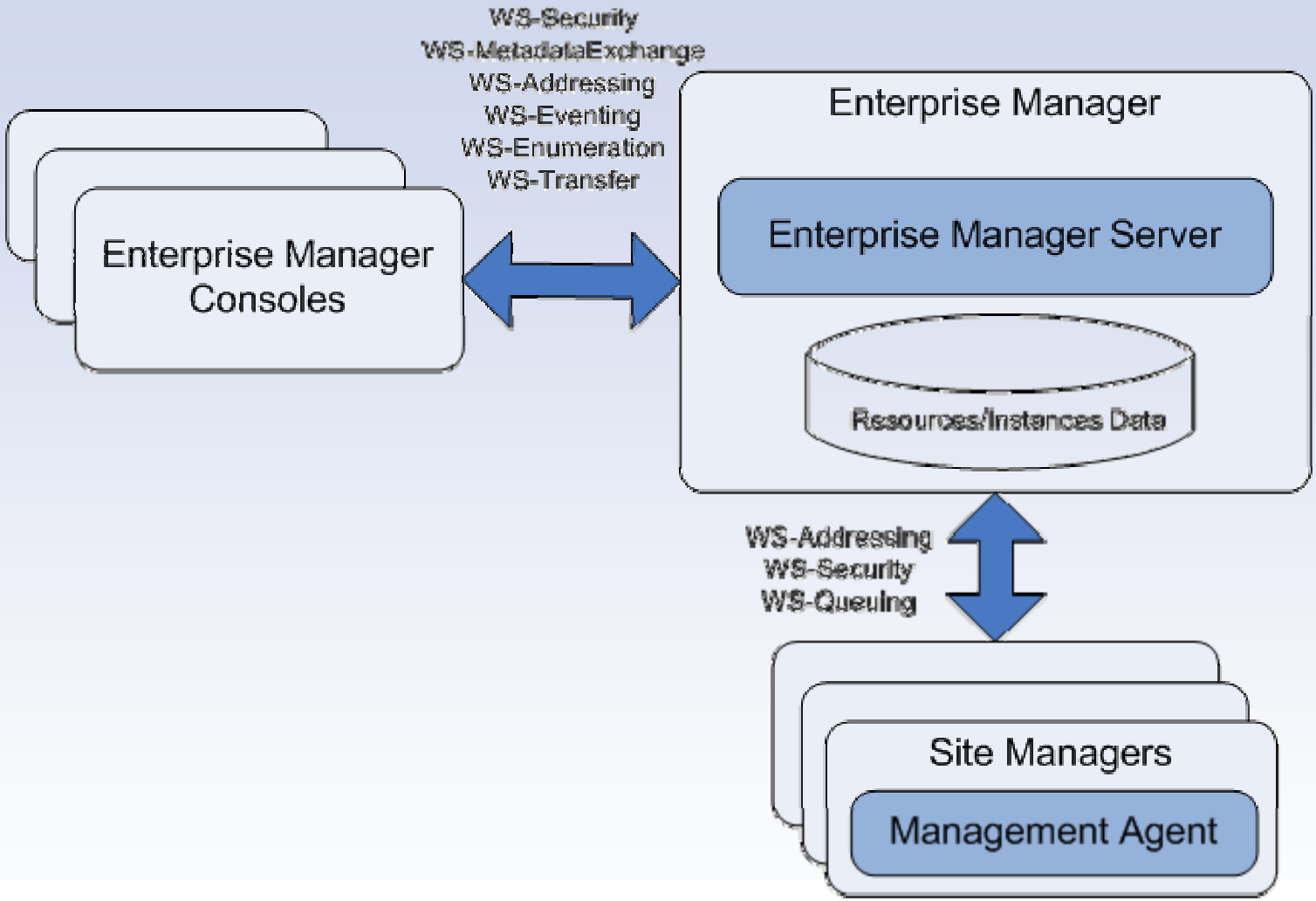
Enterprise Manager Overview

- Rich, standalone console provides a single view of the entire RFID network
  - Service installed on dedicated machine
  - Console accessed by browser from any machine
  - Web Services Management (WS-M) implementation

- Security policies administered by Enterprise Manager

- Manages RFID Anywhere nodes through policies so if a component fails, a replacement can assume configuration of failed device
  - Can be used to define configuration groups and profiles to simplify the management of thousands of RFID Anywhere sites

RFID Anywhere Enterprise Manager



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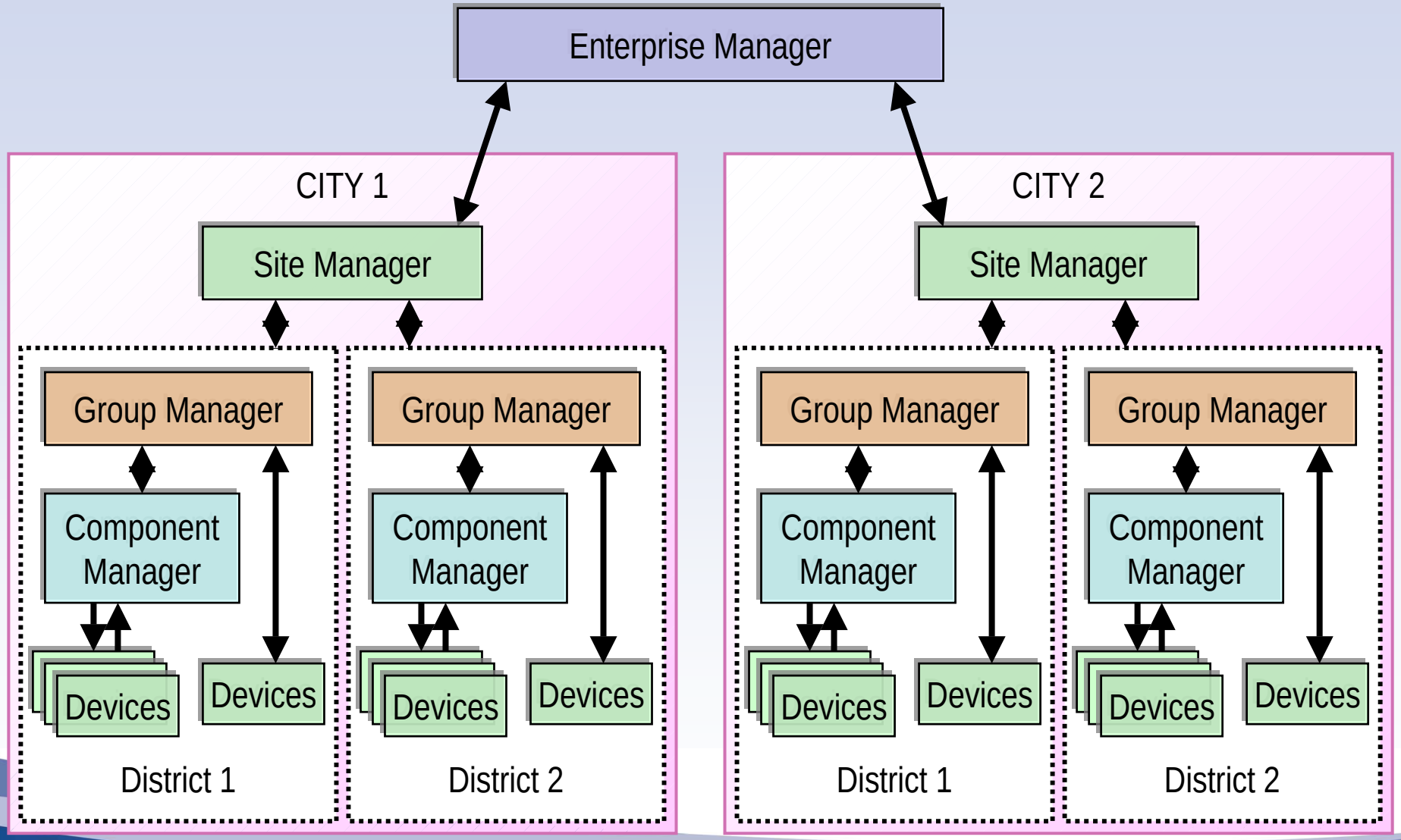
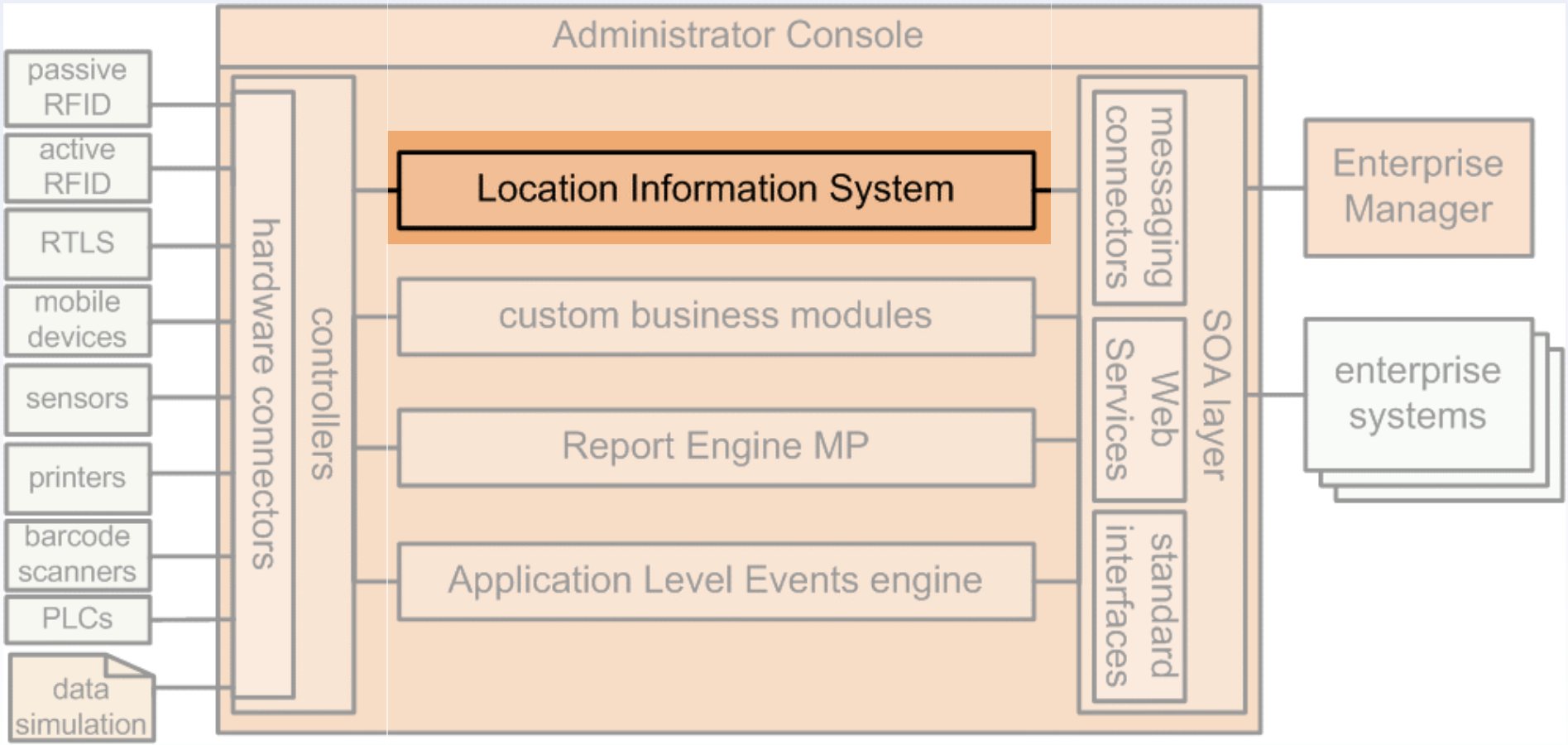
Enterprise Manager Architecture



RFID Anywhere Architecture



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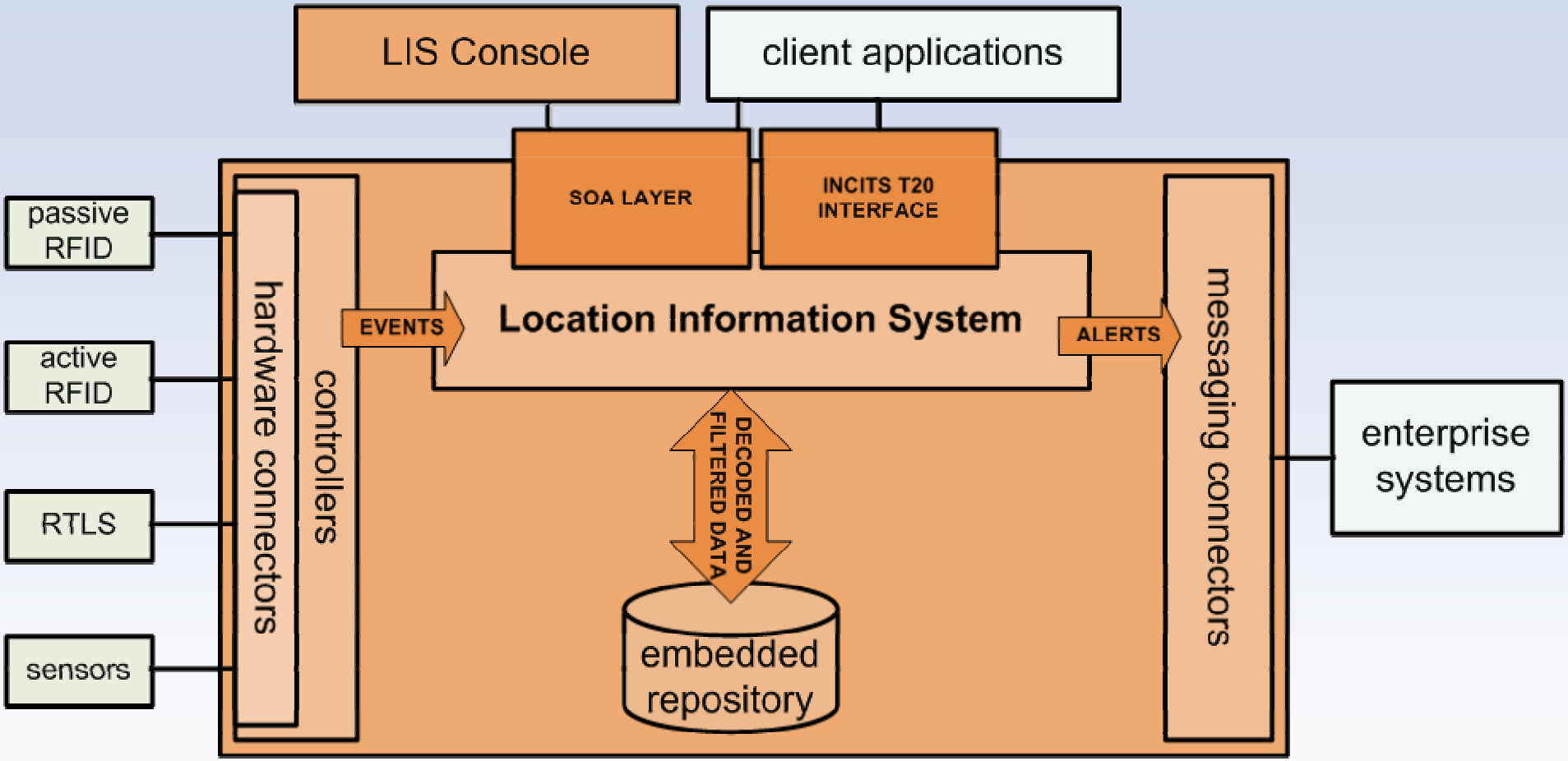
Location Information Systems (LIS)

- Integrates and combines a variety of technologies to locate and track assets
  - Active RFID, Real Time Location Systems, positioning engines, barcode, environmental sensors and others
  - Calibrate locations and associate fixed data sources with coordinates
  - Enable intelligent associations between the sensory data to establish not only location, but also provide ‘context awareness’
- Persist, query and represent location of assets
  - Graphically with maps, via reports, or through SOA layer
- Comprehensive alerting
  - Point-and-click creation for tag movement and business context changes
  - Flexible delivery through messaging connectors (i.e. SMTP, TCP/IP)

Location Information System Architecture



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Common LIS Cases

- Complement RTLS system
  - Enhances functionality, performance and management of homogeneous RTLS environment
- Non-RTLS asset tracking
  - Provides complete asset tracking system for environments where RTLS technology is not required
- Mixed mode asset tracking
  - Enables asset tracking using multiple technologies including RTLS, Active RFID, bar-coding, and other sensors

Value Add to LIS Systems

RFID Anywhere LIS can provide additional value to an RTLS environment with the following features:

- Smoothing functionality
  - Generates data only when asset ‘really’ moves, not for small location changes or inconsistencies
- Mapping/GIS functionality
  - Enhanced capabilities for mapping and reporting
- Development API
  - Single, productive API for application development
- Scalability
  - Integrate data from multiple positioning engines in a single mapping system and data repository
- Event-driven architecture
  - Integration of RTLS data into RFID Anywhere event-driven model

RFID Anywhere…

- Import position engine elements, maps
  - Leverage configuration and calibration from RTLS system
- Add other sensors to map
  - Associate XY positions to sensors, RFID readers, etc.
- Define map ‘areas’
  - Flexible area definition on top of existing maps
- Define themes
  - Existing tag fields, plus unlimited custom attributes, unique map icon
- Associate tags to themes
  - Advanced grouping and attribute entry
- Define reports/queries
  - i.e. *“Show all vehicles on street 1 with expired road tax”*
  - Graphical (map) or tabular (HTML) results to view or process
- Define alerts
  - i.e. *“Alert me if vehicle enters restricted area”*

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Benefits Of Using RFID Anywhere

custom business logic

data + business context

hardware integration and co-ordination

development flexibility

network management

embeddable

Complete SOA layer

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Build Your Solution The Right Way

- Let RFID Anywhere provide the foundation needed for effective, scalable and high-performance RFID and sensor networks
  - Solutions built with RFID Anywhere can offer **unmatched intelligence and automation** thanks to an event-driven architecture and multi-device support
  - Building on RFID Anywhere means you can **focus on writing business logic**, and not get lost in low-level hardware complexities
  - Broad device support in RFID Anywhere means you can **pick the hardware that is right for you** today, and grow easily
  - Distributed deployment and centralized management means you can deploy your hardware and **business logic where it will be most effective**

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