Event Processing for RFID Enabled Enterprise Application

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SAP
RFID Is a Cross Industry Initiative
Basic Concepts
**RFID and EPC (Auto-ID)**

How does RFID work?

![Diagram of RFID system](image)

**Electronic Product Code (EPC)**

- **Version** — 8 bits
- **Header**
- **EPC manager** — 28 bits
  - (> 268 Million)
- **Product Class** — 24 bits
  - (> 16 million)
  - **Object class**
- **Serial Number** — 36 bits
  - (> 68 billion)
An End-to-End Auto-ID/EPC Solution

Data-oriented Middleware

Device-oriented Middleware

Device

Tag & EPC

- Tag -

- EPC -

21.203D2A9.16E8B8.719BAE03C

Device-oriented Middleware:
- Scale
- Mobile Device
- Optical
- Printer
- DeviceNet
- Lightstack

Data-oriented Middleware:
- Data Store
- RFID
- PLC
- Profibus Digital I/O
- Counter

Tag & EPC: 21.203D2A9.16E8B8.719BAE03C
Packing Operation

1. Pack Order
2. Expected Pack (with SKU)
3. Case and Items hierarchy message
4. Pack Validation

Device Controller (DC)
- Printer
- RFID
- Lightstack

Data Engine (DE)

Logistic
Smart Reading and “Dum” Reading

Device Controller (DC)

Data Engine (DE)

Logistic

Pack Order

( 3 ) Case and Items hierarchy message

Smart Reading

Dum Reading

Printer

RFID

Lightstack
Use Case
A global network with multiple organizations and each organization has multiple sites

- Logistic Operations
  - Goods receive
  - Unpack
  - Store
  - Pick
  - Pack
  - Load
  - Delivery

- Asset Management
  - Asset location tracking
  - Security

- Maintenance
  - Routing maintenance
  - Preventive maintenance
Asset Management

Diagram showing the layout of a logistics center with various zones and gates.
Event Processing
A Hierarchical and Distributed Data Middleware
Challenges

- Large data and event volume
- Incomplete and out-of-order Events
- RFID is an enabling technology
- Multiple business processes associated to a single reading
- Push down business context
Incomplete and Out-of-Order Events
Multiple Business Processes Associated to a Single Reading
Push Down Business Context
Wish List

- A hierarchical and distributed Complex Event Processing Infrastructure
- Coordinate and synch from different layers
- Easy to be customized by the context from multiple business applications
- High performance and scalable
- Easy to integrate with existing business applications
- Easy to add new activities (processing)