DOD RFID Policy: Leading the Way in two Worlds – Active and Passive RFID
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Agenda

• DOD and Wal*Mart
• RFID Overview
• Why RFID
• DOD Concept of Operations
• DOD Implementation
• Future/Challenges
DOD would be like Wal-Mart...

...if Wal-Mart's 3000+ stores moved...

...if a Wal-Mart stockout meant that everyone inside the store could die.

...if associates had to wear a different kind of vest.
Wal-Mart is a lot like DOD

Food, clothing, tools, batteries, office supplies, housekeeping suppliers, fuels, lubricants, greases, guns, ammunition, camping equipment, field gear, personal care products, medical supplies and prescriptions, consumer durables, vehicles, construction materials, tires and other repair items.

Comparable product lines. Are these DOD classes of supply, or Wal-Mart Lines of business?
Automatic Identification Technology Suite

- Linear Bar Code
- 2D Symbol
- OMC Optical Memory Card
- STS Satellite-Tracking Systems
- Smart Card/CAC
- CMB Contact Memory Button
- RFID - Active Radio Frequency ID
- RFID - Passive Radio Frequency ID
Characteristics of RFID

- A form of electronic labeling (read/write capability)
- Can be interrogated at a distance and hands free “On-the-Fly” reads
- Depending on the frequency, does not require physical line-of-sight or contact between reader/scanner and the tagged item.
- Can contain large quantities of unique digital info.
- Greater placement flexibility on or in an item
- Virtually low maintenance on the product
- Extremely low error rate. Data cannot easily be copied.
- Can be interfaced with other micro sensors to collect previously non-existent environmental data/Location
The RF Spectrum

RFID is the classic “DISRUPTIVE Technology”
RFID - AutoID & EPCglobal

- Founded at MIT in Oct 99 – SAP is founding software sponsor
- 100+ members – new centers in England, Switzerland, Australia, China & Japan
- Becoming the largest, most successful standards consortium
- Early collaboration of retailers and suppliers will reduce investment risk & adoption challenges
- Main initiatives: 5¢ Tag, EPC - Electronic Product Code, PML - Physical Markup Language, ONS - Object Naming Service

Global benefits of an integrated Smart Item network estimated to be over U.S.$240 billion annually.

Over 550 billion different items pass through the members’ supply chains every year.
Opportunities from RFID tagging

Opportunities From Passive RFID Tagging

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Store-Level
Promotions and Pricing
Enhanced Consumer Experience
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Reduction
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Aging/Quality Control
What is a smart label?

A paper label with RFID inside

... and a chip attached to it

... on a substrate e.g. a plastic foil ...

... an antenna, printed, etched or stamped ...

...A sophisticated computing and communications device

...A wireless extension of Information Systems
RFID: Active vs. Passive

Active RFID
- internal battery life up to 8 years
- long range 100 feet or more
- high price precludes widespread adoption

Passive RFID
- computer chip attached to small antennae
- no battery – tag “reflects” an ID number back to a reader
- short range – 1-3 ft.
- low prices allow for a widespread deployment and use
The Problem

Uncertainty in the Supply Chain
- Lack of customer confidence
- Lack of timely consistent information
- Unsynchronized materiel flow and hand-offs...disparate systems
- Lack of collaboration in planning and execution
- Environment and infrastructure
- Diverse or misaligned Business Processes...no textbook solutions

"My logisticians are a humorless lot...they know if my campaign fails, they are the first ones I will slay" ...Alexander the Great
Facing new challenges...

- Rapidly moving force on a dynamic battlefield
- Demand for better information on assets
- Need for more effective management of inventory

- Improve business processes now
- Influence the direction and cost of technology development
- Drive the standards to work for us
- Facilitate the implementation of Unique Identification (UID)
Why RFID? Bar Codes not going away

• Eliminates human error
• Improve data accuracy
• Asset visibility
• Performs in rugged, harsh environments
• Dynamic multi-block Read/Write capability
• Facilitate source data collection
• Simultaneous reading & identification of multiple tags in field

• Where line of site/communications are questionable
• Where read/write is required
• Where unattended scanning is desired
• Static information
• Replacing Manual Procedures
• Tags can be re-used in read/write environment

RFID is critical to DOD Logistics Transformation!
DOD operates the largest end to end active RFID system in the world

30+ Countries and over 1400 sites world-wide
Passive RFID for DOD

VISION: Implement knowledge-enabled logistics through fully automated visibility and management of assets in support of the warfighter.

GOAL: Employ mature and emerging commercial supply chain technologies to optimize the DOD supply chain.

OBJECTIVE: Utilize RFID, as an integral part of a comprehensive suite of AIT technology, to facilitate accurate, hands-free data capture in support of business processes in an integrated DOD supply chain enterprise.
A primary goal of the DoD RFID plan is to create a complementary Passive-Active-Passive relationship.
The association of an active tag and the passive tag provides an improved “inside the box/pallet/container” visibility.

- **Active Container Tag** associated to a...
- **Passive Pallet Tag** associated to a...
- **Passive Carton Tag** associated to …
- **8 UID Packaging Tags** each with 1 associated UID item
Passive RFID is an enabler to create an Integrated DOD Supply Chain

Cases/Pallets are labeled with passive RFID tags. Cases are associated to pallet

Cases/Pallets are read as they are received and new shipments are labeled. Orders are verified for accuracy

Cases/Pallets are associated with Active RFID to provide TAV.

Data is timely and accurate via network of linked readers allowing asset visibility along the entire supply chain

- Manufacturers/Suppliers
- Distribution Centers/Depots/TDCs
- Commercial/Military Carriers
- TMO/Supply/Theater Depots
- Customer

When shipments are reconfigured a new RFID Tag is created for the pallet and associated with cases on that pallet

The cases/pallets are automatically received with few disputes and info is shared with the AISs. Reconfigured shipments receive a new RFID Tag.

Customers have visibility of requisitions and are confident in the status provided by the system

Timely and Accurate Data
Passive RFID in the Supply Chain

- Tagged items/cases/pallets shipped from suppliers
- Shipment/order data to DOD
  - *Advanced Ship Notice (ASN)* Required
- Shipment/order data captured in DoD Data Environment
- RFID tag read on arrival at DOD Receiving Point
- Tag read generates *Transaction of Record*
  - Receipt
  - Acceptance
  - Close-out
  - Payment
  - Inventory adjustment
  - Update to asset visibility systems
Passive RFID Requirements

- Tagged cases and pallets shipped to DOD receiving points beginning 1 Jan 2005
- All AIT peripherals must be RFID capable, and all AIS’s be RFID capable commencing FY 07
- Tagged *packaging* for items that require a Unique Identification (UID) shipped to DOD receiving points beginning 1 Jan 2007
- Tags will use EPC-technology specifications
  - Accept SGTIN, SSCC, DOD data constructs
  - Currently available:
    - Class 0  64 & 96 bit tags
    - Class 1  64 & 96 bit tags
- When available: UHF Generation 2 EPC tags

No “Silver Bullet” with RFID
Who will this Affect?

- ALL DOD suppliers of ALL material and goods purchased by the Department
- Excludes bulk commodities (sand, gravel, fuel)
- Commodity assessment underway

[Map of locations including DDC San Joaquin, CA, DDC Susquehanna, PA, FT Hood, TX, Pine Bluff Arsenal, Camp Lejeune, NC, Blue Grass Army Depot, KY, Norfolk Ocean Terminal, VA, DDC San Joaquin, CA, Dover AFB, DE, Ramstein AFB, Germany, and FT Hood, TX.]
January 1, 2005
Classes of Supply:
- II, VI, IX, I (PORs/MREs)
Level of Tagging:
- Shipping Containers, Palletized Unit Loads, Exterior Containers
Ship to locations:
- San Joaquin, Susquehanna

DFAR – new contracts after 1 OCT 04

January 1, 2006
Classes of Supply:
- Begin All Classes
Level of Tagging:
- Shipping Containers, Palletized Unit Loads, Exterior Containers
Ship to locations:
- Strategic CONUS DLA Depots, TRANSCOM Facilities & Service Maintenance Facilities

January 1, 2007
Classes of Supply:
- All Classes
Level of Tagging:
- Shipping Containers, Palletized Unit Loads, Exterior Containers, UID Item Unit Pack
Ship to locations:
- All Locations
Commodity Implementation

Commencing January 1, 2005

- Class I Subclass – Packaged Operational Rations & Packaged Food
- Class II – Clothing, Individual Equipment, Tools, & Administrative Supplies
- Class VI – Personal Demand Items
- Class IX – Repair Parts & Components

Commencing January 1, 2006

- Class I – Subsistence & Gratuitous Health & Comfort Items
- Class III – Packaged Petroleum, Lubricants, Oils, Preservatives, Chemicals & Additives
- Class IV – Construction & Barrier Equipment
- Class V – Ammunition-all types
- Class VII – Major End Items
- Class VIII – Medical Materials
Passive RFID Initial Implementations

- **Technology Demonstration**
  - Combat Feeding Global Asset Visibility

- **Operational Implementations**
  - FISC Norfolk Ocean Terminal
  - Individual Protective Equipment (IPE)
  - Strategic Depot to Operational Unit

- **Planned Implementation Projects**
  - Electronic Military Shipping Label (MSL)
Field Tests/Demo/Pilot Lessons

- It's all about the RFID data...good for a short period of time (actionable data)
- Reader Rates Less Than Optimal For Production
  - Unable to read items near metals or items filled with liquids
  - Unable to read items in middle or bottom of pallets
- Unable to read items in middle or bottom of pallets
- RF Interference with Installed Wireless LANs
- Integration Issues with current Legacy systems and ERP installs (data overload)
- Communications issues
- Erroneous Tracking of items
- Compatibility issues with current infrastructure
- Security concerns/issues

RFID is an enabler, it cannot fix fundamentally bad processes
RFID will enable benefits across the supply chain.

**Initial benefit areas**

- Improve Intransit and Asset Visibility
- Improve Shipping/Receiving/Transportation Timeliness
- Improve Shipping/Receiving/Transportation Accuracy
- Inventory Management Improvements
- Improved Labor Productivity
- Pipeline Reduction
- Speed Payment Process
- Automated Receipt and Acceptance
- Reduce Shrinkage

**Other benefit areas**

- Reduce cost of materiel
- Reduce NISs
- Eliminate Duplicate Orders
- Automated Receipt
- Reduce Shrinkage

**Demand/Information Flow**

Manufacturers/Suppliers → Distribution Centers/Depots → POEs/PODs → Transportation/Supply/Theater Depots/TDCs → Customers
Long-Term RFID Benefits in the DOD Supply Chain

- **DOD Business Processes**
  - Facilitates Hands-Off Data Capture
  - Improves Data Accuracy
  - Enhances Asset Visibility

- **Downstream Derivative Improvements**
  - Optimizes Transport/Lift Utilization
  - Reduces Logistics Footprint
  - Improves Manpower Utilization
  - Improves Force Tracking
  - Improves Logistics Processing Time
  - Enhances Interoperability with Industry

Setting the foundation for future supply chain improvements…TODAY!
**DFAR Clause Details**

- **Two Major Requirements for Suppliers**
  - Passive Tagging at the case, pallet, UID item packaging level in accordance with the Implementation Plan
  - Advance Ship Notice (ASN)
- **DFAR clause references the MIL-STD 129 for implementation details**
  - Definitions
  - Tag Data Standards
  - Tag Placement
- **DOD has published a Supplier Guide that contains information that details requirements for compliance**
Challenges Ahead

• **State of the technology**
  • Read ranges
• **Economic Issues**
• **Regulatory Issues**
• **Standards**
  • Air Interface Protocols
  • Frequencies
  • Data formats/constructs
• **DOD AIS Architecture**
• **Education & Training**
• **Phasing of implementation**
• **Business systems integration**

*RFID – Future Reality…unlocking the potential*
“I think the industry has sold itself on a program that offers so little return that it simply won’t be worth the trouble and expense”

A Midwest Grocery Chain Executive discussing the potential of the barcode in 1975
"Our task is to get people from where they are to where they have not been"  Henry Kissinger