

TSTC RFID Training and Research Center

# DoD RFID 101

# Presentation Overview

- The RFID Center at TSTC
- RFID Basics
- DoD RFID Requirements Overview
- Industry Overview
  
- Questions
- Demonstrations

# Personal Introduction

- Bob Hoheisal, Director of the RFID Training and Research Center
- University of Arkansas – IS / Logistics
- RFID Global Solution
  - L3 – WMS
  - Boeing – Smart Freezer
  - DISA – Smart Cart

# Training Center Introduction

- Created in 2007 from a Wagner / Peyser Grant
- Wide Range of Equipment
- Services
  - Custom Training
    - RFID / UID / WAWF
  - Tag Testing
  - Tag Printing
  - Consulting Services

TEXAS  
WORKFORCE SOLUTIONS  
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November 12, 2007

Pay to the order of

Radio Frequency Identification Training Project/ TSTC Waco

\$305,000

Three Hundred And Five Thousand Dollars

RFID Training and Facility  
WIA Wagner-Peyser Fund

Diane Rath  
TWC Chair and Commissioner Diane Rath

# What is RFID...?

- Radio Frequency Identification (RFID) is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is an object that can be attached to or incorporated into a product, animal, or person for the purpose of identification using radio waves. Chip-based RFID tags contain silicon chips and antennas. Passive tags require no internal power source, whereas active tags require a power source.

# 3 Pieces of an RFID System

- Hardware
  - Readers, tags, network infrastructure, sensors, and others
- Software
  - Middleware, firmware, database, enterprise ERP
- Business Processes
  - Use case, data flow, correct analysis of existing processes, needs vs. want

# Types of RFID

- **Active:** Tags which are powered by an on board power source and beacon out(Long Range)
- **Passive:** Tags which are powered by the energy of the reader's radio waves (Short Range)
- **Semi-Passive:** Tags which have properties of both active and passive tags

# Active vs. Passive

- Active

- High tag cost
- Low reader cost
- Long range
- Very little standards
- RTLS
- Battery life

- Passive

- Low tag cost
- High reader cost
- Short range
- Good standards
- Long life
- Embedded

# Equipment Examples



# Equipment Examples



# Mobile Readers



# Antenna Examples



# Common Vendors

Active Vendors	Passive Vendors	Printer Vendors
<ul style="list-style-type: none"><li>•Savi</li><li>•RFCode</li><li>•Wavetrend</li><li>•Savr</li><li>•Identec Solutions</li><li>•AeroScout</li></ul>	<ul style="list-style-type: none"><li>•Symbol</li><li>•Alien</li><li>•Intermec</li><li>•Thingmagic</li><li>•Omron</li><li>•Sirit</li><li>•Impinj</li><li>•Samsys</li><li>•Awid</li></ul>	<ul style="list-style-type: none"><li>•Zebra</li><li>•Printronic</li><li>•Datamax</li><li>•Paxar</li></ul>

# Installation Examples



# Installation Examples



# Installation Examples



# Installation Examples



# Active Tag Example



# Who is EPC Global...?

- EPCglobal is a joint venture between European Article Numbering International (EAN) and the Uniform Code Council (UCC-currently manages Bar Code standards)
- Leading an effort to create global standards for RFID use
- EPCglobal is an open, worldwide, not-for-profit consortium of supply chain partners working to drive global adoption of the EPCglobal Network™.
- Using Electronic Product Code™ (EPC) and Radio Frequency Identification (RFID) technologies, the EPCglobal Network will provide for immediate, automatic and accurate identification of any item in the supply chain of any company, in any industry, anywhere in the world.
- EPCGlobal Inc's website: <http://www.epcglobalinc.org>

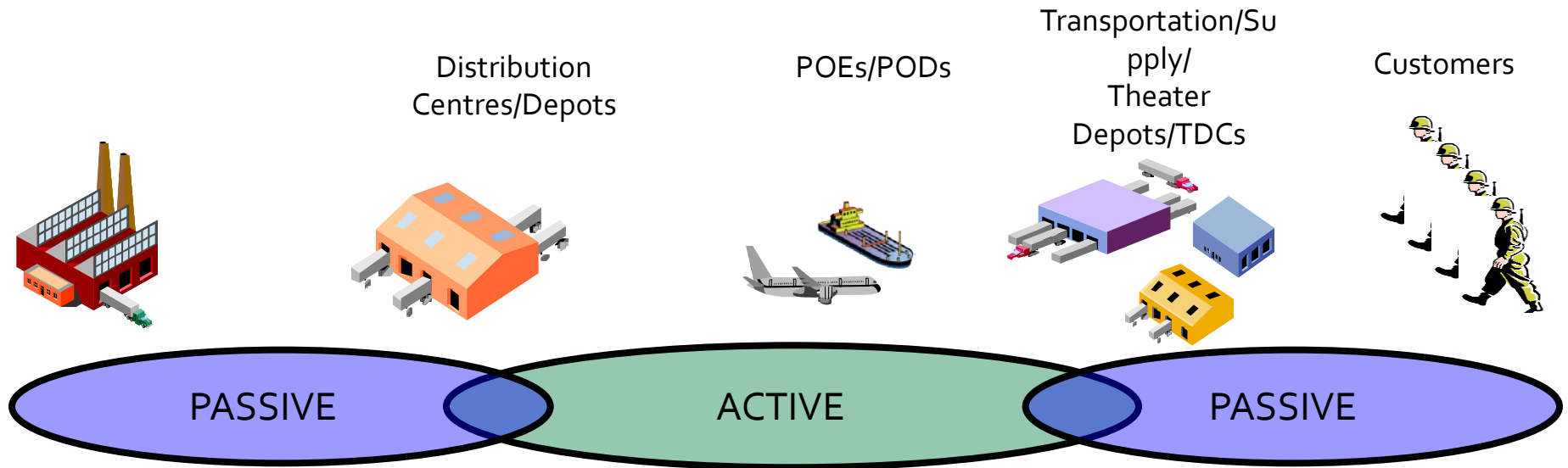
# Why Use RFID...?



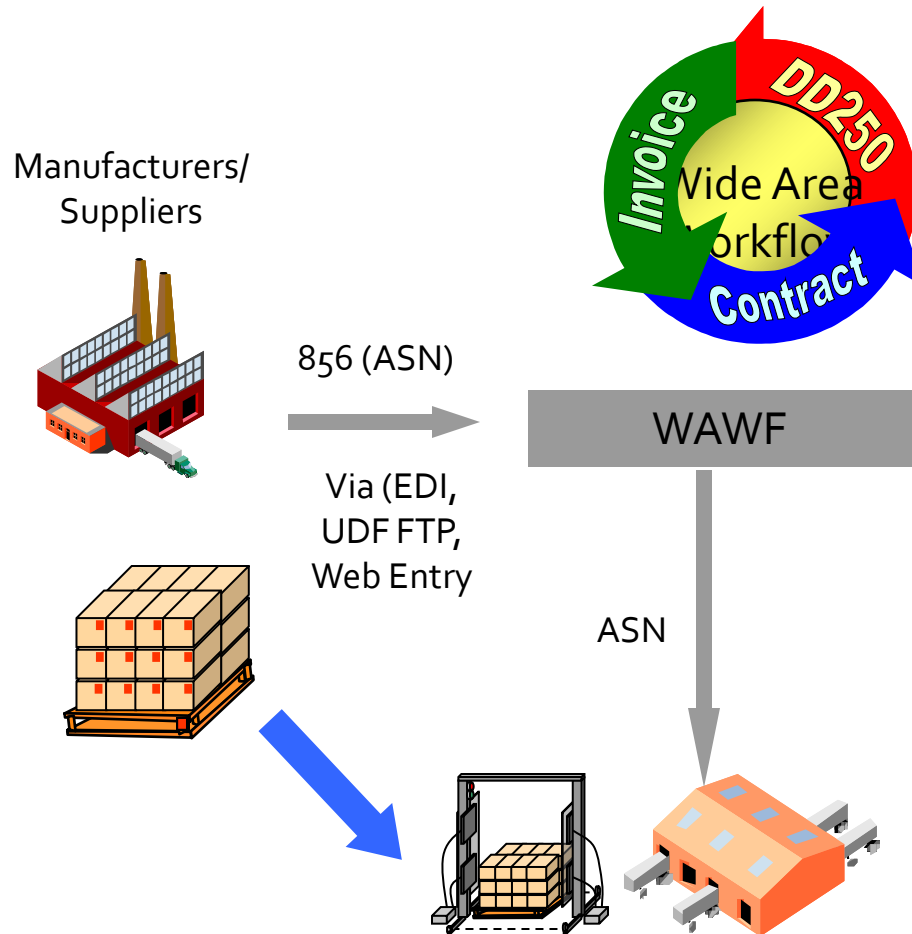
# Why is the DoD Using RFID...?

- *Increase Warfighter/Customer Confidence in the Reliability of the DoD Supply Chain*
- *Improve Visibility of Information and Assets throughout the DoD Supply Chain*
- *Improve Process Efficiency of Shipping, Receiving and Inventory Management*
- *Reduce Order Ship Time and Customer Wait Time*

# End to End Visibility



# Supplier to Customer



# Supplier Requirements

- RFID requirements are dictated on a contract by contract basis
- Items and shipping destinations are outlined the DFARS passive RFID clause
- Labeling is to be performed to MIL-STD-129P specifications

# Tag Data Specifications

## DoD-96 Tag Data Construct

Header	Filter	Government Managed Identifier (Cage Code)	Serial Number
8 bits	4 bits	48 bits	36 bits

### Header Identifier

<b>2F</b>	00101111 DoD-96
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### Filter Values

<b>0000</b>	Pallet (palletized unit load)
<b>0001</b>	Case (shipping and exterior container)
<b>0010</b>	Unit pack
<b>All others</b>	Reserved for future use

**Serial Number** — Uniquely identifies up to  $2^{36} = 68,719,476,736$  items

# Tagging Specifications

- Case – Pallet (Item) Level Tags
- Use Existing Packing Label or Separate
- No Overlapping of RFID Labels
- Must Meet Placement Requirements
- Tag Must be Readable @ 9 Feet
- Item – Case – Pallet Aggregation
- Tag Data Must Be Sent with ASN to WAWF

# DoD Current Overview

- Last Update to DFARS Clause was in 2007
- Item Level Pilots Have Begun
- Item Level Tagging Across the Entire Supplier Network is the Goal
- Lots of Lessons Learned
- DoD is Moving Forward – Compared to the Private Sector

# Initial Steps For New Suppliers

- Analysis of Contract Requirements
- Analysis of Tagging Volume
- Determine the Level of Integration
- Become Educated on the Equipment
- In-house or Contracted Implementation
- Make Vendor Selection
- Lessons Learned
- Scale Out

# New Equipment

- New Tags
  - Metal mount
  - BAP
- New Readers
- ISO 18000-7 Active Tags
- Mojix Star System

# New DoD Projects

- Argonne National Laboratory
  - Haz-Mat Tracking
- Iraq – Pakistan Corridor
- Hawaii - DDPH
- DLA – Strategic Planning For Enterprise Data Collaboration

# Questions...

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