Asset Management in the U.S. Air Force: Using RFID in the Global Supply Chain

Mark Reboulet
AF AIT Program Manager
Wright-Patterson AFB
Mark.reboulet@wpafb.af.mil
AF AIT PMO’s Mission

Deliver Automatic Information & Data Capture solutions and capabilities to enhance the Supply Chain

- Supply chain refers to AF and broader DoD
- Requires enterprise view of the supply chain
  - Consider both AF and DoD impacts
  - Stovepipe or point solutions not acceptable
  - Actionable Information must be shared
Industry Accomplishments

✓ Advances in Tag Design
✓ Advances in Reader Design
✓ Standards
?
Enterprise Architecture
Legacy AF Data Collection Architectures
Today’s Data Collection

Single Legacy System
Today's Data Collection

Single Legacy System
Today’s Data Collection

Single Legacy System
Today's Data Collection

Passive RFID

MAGIC?

Single Legacy System
A Different Way to Think about ADC

- **Receipt**
- **Asset ID**
- **Movement**
- **Shipment**
- **Close Job**
- **Inspection**
- **UII Read**
- **Open Job**
- **Generate Barcode**
A Different Way to Think about ADC

- Supply Chain Event
- Receipt
- 2D Barcode
- Linear Barcode
- Passive RFID
- Active RFID
A Different Way to Think about ADC

- 2D Barcode
- Linear Barcode
- Passive RFID
- Active RFID

Data Transformation

Supply Chain Event

Receipt
A Different Way to Think about ADC

Legacy System

Data Transformation

Supply Chain Event

Receipt

2D Barcode
Linear Barcode
Passive RFID
Active RFID
A Different Way to Think about ADC

Legacy System

Legacy System

Legacy System

Data Transformation

Supply Chain Event

Receipt

2D Barcode

Linear Barcode

Passive RFID

Active RFID
A Different Way to Think about ADC

New System

Data Transformation

Supply Chain Event

Receipt

2D Barcode
Linear Barcode
Passive RFID
Active RFID
A Different Way to Think about ADC

New System

Data Transformation

Supply Chain Event

Receipt

WiFi Tag

2D Barcode

Linear Barcode

Passive RFID

Active RFID

SAT RFID
EDCL Objectives

- Standardize Air Force Automatic Identification Technology application architecture for mobile & fixed devices
  - Service oriented
  - Web-based user interfaces
  - Elevate business logic and rules from code
  - Loosely couple AIT from supporting AISs
  - Not a system of record
- Utilize GCSS-AF services
- Provide connected, casually connected, & disconnected operations
- Centrally certify & accredit architecture
- Reduce base-level AIT application hardware footprint
- Reduce communication and maintenance squadron support for AIT applications
- Increase speed of changes to AIT
EDCL Mobile Supply Chain AIT

Licensed Technology

Mobile Data Flow

Supported Capabilities

CAC Login

Mobile AIT Devices

Mobile AIT Devices

AF & DoD AISs

FIPS 140-2 Data at Rest & In-Transit Encryption

Connected, Casually Connected, & Disconnect Mode

Abstraction of AIT hardware from applications

Decoupling of AIT devices from AISs

FIPS 140-2 Data at Rest & In-Transit Encryption

Connected, Casually Connected, & Disconnect Mode

Abstraction of AIT hardware from applications

Decoupling of AIT devices from AISs
EDCL Fixed Supply Chain AIT

Licensed Technology

Fixed Device Data Flow

Supported Capabilities

Fixed AIT Devices

Connected, Casually Connected, & Disconnect Mode

Abstraction of AIT hardware from applications

Decoupling of AIT devices from AISs

Network Connection & Authentication to GCSS-AF

Synchronize AIT Events To Enterprise

AIT Event Storage

Transform Event to AIS Transaction

Machine Certificates

Local GlobeRanger Middleware

Oracle

GlobeRanger Workflows
AF Enterprise AIT Architecture

Automated Information Systems

CMOS  ES-S  CAS  IMDS  IMPRESA  PIC Fusion  DoD IUID Registry  GATES  RF-ITV

EDCL

Enterprise Inventory
Enterprise UII Read

Asset Mgmt  CAS AIT  POMX  PIC  AIMT  Triad

Mobile Computing

pRFID  aRFID

Fixed Infrastructure

Automatic Identification Technology
Active RFID Distribution Support Structure

- **Active RFID Read/Write Capability AF-Wide**
  - 445 docking stations at 224 sites to write tags for cargo entering Defense Transportation System
  - CMOS/Site manager integrated for robust RFID capability
  - PDKs for deployed Traffic Management capability
- **Fixed infrastructure of 140 readers installed throughout distribution channels at 53 sites worldwide**

<table>
<thead>
<tr>
<th>Fixed Infrastructure Location</th>
<th>Sites</th>
<th>Readers</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMC-USTC</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>CENTAF</td>
<td>21</td>
<td>38</td>
</tr>
<tr>
<td>USAFE</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>PACAF</td>
<td>13</td>
<td>47</td>
</tr>
<tr>
<td>CONUS Force Projection</td>
<td>4</td>
<td>12</td>
</tr>
</tbody>
</table>
Active RFID Warehouse

- AF operates warehouse of active RFID equipment to support unit move requirements and distribution support infrastructure
  - 1,500 ANSI RFID Tags
  - 35 PDKs
- Warehoused tags available to support unit move deployment requirements at no cost
- Units must budget, purchase, and maintain tags to support sustainment, training, and inspection requirements
Positive Inventory Control (PIC)

• The AF AIT PMO is providing support to enable the Positive Inventory Control of assets.
• The following slides describe AIT-enabled PIC capabilities for:
  – The PIC asset induction process at the depot storage facilities
  – The transportation of PIC assets between the depot storage facilities and bases with a mission requiring PIC assets
  – The transportation of PIC assets between the depot storage facilities and depot maintenance facilities
Upon transfer of an asset from DLA to AF, the Marking Team use the Positive Inventory Control System (PICS) to:

- Assign UID (If Eng. Analysis Completed)
  - NSN, CAGE, Part #, Serial #
  - Asset Description & Condition Captured

- Apply Passive RFID Tags
  - 2 identical passive tags on each container
  - Tags have barcode backup

- Store Asset
  - Captured data, UID, and RFID verified and stored in database
  - Asset stored in Bay F using DSS
Example Integration: AIT Enabled Supply Chain
RFID
World Wide Inventory (WWI)

• Leverages the passive Radio Frequency Identification (RFID) tags already affixed to each asset storage container
• Decreases resource requirements to accomplish the semi-annual WWI
• RFID WWI Capability Tests resulted in 87% labor hour savings and unquantifiable first-pass accuracy increase over manual inventory process for a 7,800 asset warehouse
Bottom Line

- AIT is a key enabler to transforming the AF/Joint Supply Chain

- RFID, UID, and other AIT being integrated into overall AF AIT implementation strategy

- AIT technologies are only useful if exploited for a valid business purpose
  - Business case analysis is key to future technology insertions

- Leverage EDCL to implement AIT

- AF committed to implementation of AIT supporting AF and Joint supply chains
Questions
Thank You