DLMS INTRODUCTORY TRAINING
Module 5 – IUID & RFID - Emerging Technologies

Defense Logistics Management Standards (DLMS) Introductory Training

IUID & RFID - Emerging Technologies

DLMS Training Catalog

Module 1 - Introduction to the DLMS
Module 2 - Electronic Data Interchange (EDI) Basics and ASC X12 EDI Definitions and Concepts
Module 3 - DLMS Functionality & Transaction Life-Cycle
Module 4 - DLMS Implementation Convention Content
Module 5 - IUID & RFID - Emerging Technologies
Module 6 - Creating/Reengineering DOD Logistics Business Processes
Module 7 - Enterprise Interoperability Tools
Module 8 - DoD Activity Address Directory (DoDAAD)
Module 9 - Supply Discrepancy Reporting (SDR)
Module 10 - DLMS Functional Financial Transaction (standalone)
Module 11 - Creating/Reengineering DOD Logistics (standalone)

http://www.dlmso.dla.mil/

DLMS INTRODUCTORY TRAINING
Module 5 – IUID & RFID - Emerging Technologies

Module Structure

Module 5 – IUID & RFID - Emerging Technologies

- **Item Unique Identification (IUID)**
- **Radio Frequency Identification (RFID)**

Module 5 Objectives

- **IUID and its relationship to the DLMS**
- **RFID and its relationship to the DLMS**
- **DLMS Transactions supporting IUID and RFID**
- **Data integration of Supply and Transportation Information**
- **Establishing parent/child relationships using DLMS transactions**

DLMS INTRODUCTORY TRAINING
Module 5 – IUID & RFID - Emerging Technologies

Unique Item Identification (IUID), Radio Frequency Identification (RFID), & DLMS

IUID, RFID, & DLMS Relationship

- **The IUID is a data set that identifies an instance of an item uniquely from all others even if it is identical to others in all other physical and functional aspects**
- **RFID is an automatic identification method, consisting of a chip and antenna, relying on storing and remotely retrieving data using devices called RFID tags or transponders.**
- **The DLMS X12 EDI and DLMS XML provide the capability to integrate the RFID tag contents with the business data and processes in the supply chain**

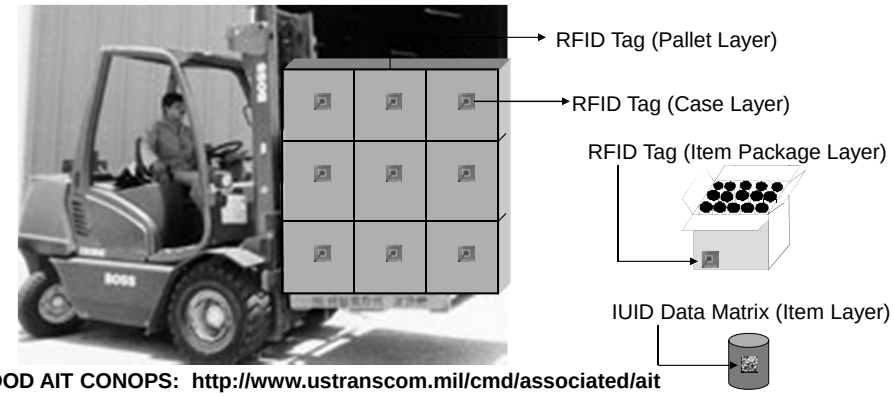
IUID, RFID, and DLMS complement each other in providing business event intelligence across the supply chain

IUID-RFID Policy Relationship

(Example)

Where required: Passive RFID tags applied at the case, pallet and package layers

Where required: IUID attached or directly marked on items using a data matrix to carry the IUID data elements



DOD AIT CONOPS: http://www.ustranscom.mil/cmd/associated/ait

Unique Identification (IUID) of Tangible Items

DOD Vision for IUID

- **Establish a strategic imperative for uniquely identifying tangible items relying to the maximum extent practical on international standards and commercial item markings, while not imposing unique government data requirements.**
- **Unique identification of tangible items will improve:**
  - ✓ Item visibility and tracking across the DOD enterprise
  - ✓ Product life-cycle item management
  - ✓ Financial Accountability and valuation of assets
  - ✓ Clean Audit Opinions on Property, Plant Equipment, and Operating Materiels and Supplies
  - ✓ Data quality and interoperability

IUID Policy Overview

- **DoD Instruction (DoDI) 8320.04, "Item Unique Identification Standards for Tangible Personal Property," was initially issued June 16, 2008 and was significantly updated and reissued on September 3, 2015**
- **DoDI 8320.04 states that items with a unique item-level traceability requirement at any time in their life cycle shall be marked and managed by UII to include as a minimum:**
  (1) Major end items, (2) Depot level reparables, (3) Nuclear weapons-related materiel, (4) Small arms and light weapons, (5) Items with a classified, sensitive, or pilferable controlled inventory item code, (6) Critical safety items, (7) Items currently serially managed or warrantied, including items in unique item tracking programs, (8) Items that require periodic test, calibration, or safety inspection, (9) Items that require technical directive tracking, (10) Items requiring intensive visibility and management, and (11) Other items, as determined by the requiring activity.
- **Under the authority, direction, and control of the USD(AT&L), the ASD(L&MR) develops IUID supply chain policy and coordinates functional business rules and approves requirements for the DOD IUID Registry jointly with the Director, Defense Procurement and Acquisition Policy (DPAP).**
- **Under the authority, direction, and control of the ASD(L&MR), the Director, DLA will coordinate and publish procedures and transaction exchange formats to incorporate the UII in logistics business processes under the Defense Logistics Management Standards (DLMS) in accordance with DLM 4000.25.**

Radio Frequency Identification (RFID)

Types of RFID Used in DOD

- **Active RFID - Longer range**
  - ✓ Continuously powered tag; internal power source
  - ✓ Low-level RF signal received by the tag
  - ✓ High-level RF signal back to the reader/interrogator
  - ✓ Usually used for longer tag read distances
  - ✓ Can store 128KB of data, to include tag number
- **Passive RFID – Shorter range**
  - ✓ No internal power source; collects energy from reader
  - ✓ Needs powerful RF signal from reader
  - ✓ Low RF strength signal returned from tag
  - ✓ Preferred for uses when tag and interrogator are close
  - ✓ Stores small amount of data (e.g., tag number)

pRFID - Optimize the Supply Chain

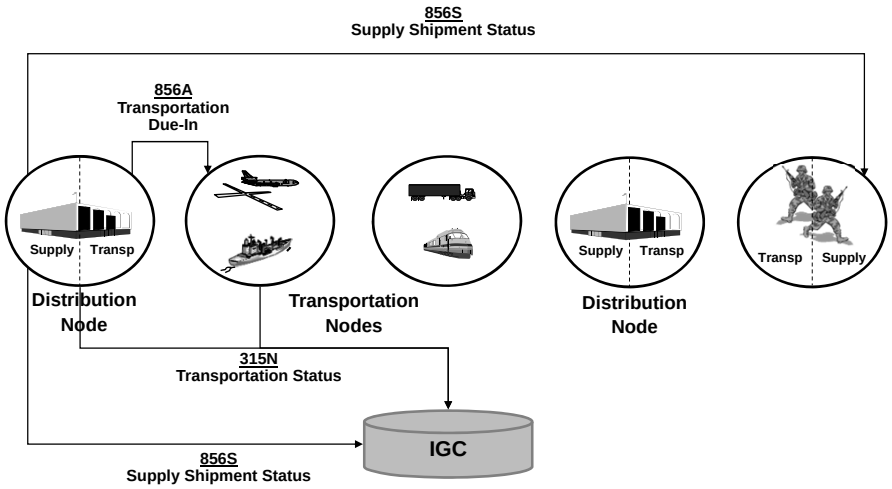
DOD is an early adopter of passive pRFID technology

- **Implement passive RFID Business Rules - 1 Jan 05**
  - ✓ **Passive tagging of materiel shipped to DOD**
- **Initial DOD capability to read passive RFID tags and use data**
- **Published DFARS Rule requiring application of passive RFID**
- **Integrated passive RFID data into the DOD Business Enterprise Architecture (e.g., DLMS)**
- **USTRANSCOM is the DOD functional proponent for AIT**
- **The latest policy and information on DOD's RFID implementation can be found at:**

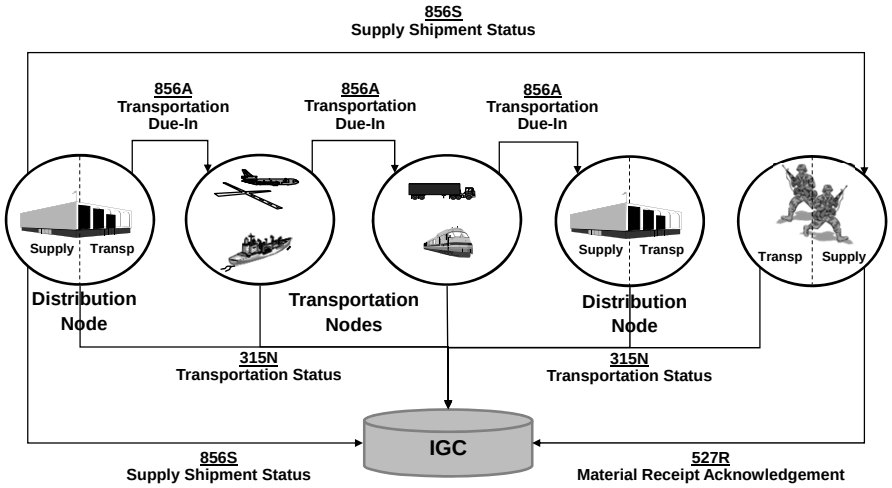
  http://www.acq.osd.mil/log/sci/ait.html
  http://www.ustranscom.mil/cmd/associated/ait/

- **Hands-Off Data Capture**
- **Improve Data Accuracy**
- **Improve Logistics Processing Time**
- **Improve Manpower Utilization**
- **Enhance Interoperability with Industry**

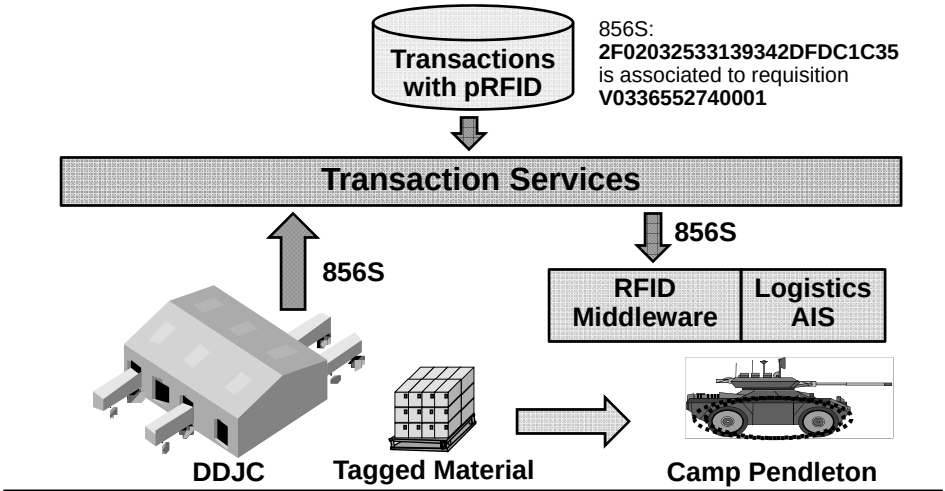
Nodal Asset Visibility



Nodal Asset Visibility

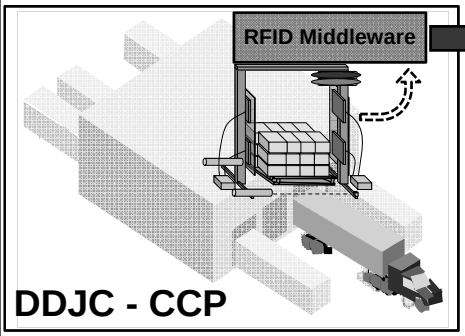


pRFID & DLMS (Enhanced Receiving)



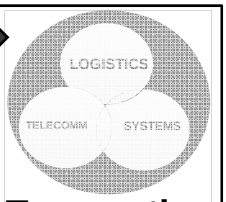
RFID and relevant business information prelodged to the receiving facility. Use to automatically trigger receipt processes upon material arrival.

pRFID & In-Transit Visibility



XML Visibility

Data Elements:
- RFID Tag # = 2F02032533139342 DFDC1C35
- Time Stamp = 7/4/2010 0900
- Location = CCP
- Business Step = Shipped



Transaction Services

XML Visibility

Transactions with RFID

Report RFID Tag read event data to DAAS

User can query WEBVLIPS or IGC to ascertain last known location of RFID tagged material.

IUID, pRFID & DLMS Operating In Concert Can Significantly Enhance DOD Supply Chain Processes

- Establish initial acquisition cost and subsequent valuations
- Identify a particular item requiring maintenance
- Identify particular problem items to be singled out for removal or upgrade
- Ensure that exact items are returned to the customer
- Locate items for expedited processing
- Maintain a record of items where DOD ownership has ended
- Track a particular item through the entire Supply Chain

DLMS Transactions Supporting IUID

DLMS IMPLEMENTATION CONVENTION		CURRENT STATUS OF IUID ADCs/PDCs
140A	Small Arms Reporting	
180M	Material Returns Reporting	
511M	Requisition Modification	
511R	Requisition	
527D	Due-in, Advance Receipt, Due Verification	
527R	Receipt	ADC 1042 and PDC 1198 (in staffing)
527R	Material Receipt Acknowledgement	
842A/W	Supply Discrepancy Report Submission	ADCs 1030, 1095, and PDC 1198 (in staffing)
842S/Q	Storage Quality Control Report	ADC 1045 and PDC 1198 (in staffing)
842S/R	Storage Quality Control Report Reply	ADC 1045
842P	Product Quality Deficiency Report	ADC 1007
846R	Location Reconciliation Request	PDC 1198 (in staffing)
856	Advance Ship Notice	ADC 129
856R	Shipment Status Materiel Return	ADC 1071 and PDC 1198 (in staffing)
856S	Shipment Status	ADC 1030 and PDC 1198 (in staffing)
861	Acceptance Report	ADC 132
867I	Issue	PDC 1198 (in staffing)
870M	Material Returns Supply Status	
870S	Supply Status	
940R	Material Release	ADC 1073
945A	Material Release Advice	ADC1073 and PDC 1198 (in staffing)
947I	Inventory Adjustment	PDC 1198 (in staffing)

NOTE: Logistics IUID business requirements are under development through a series of IUID Workshops; business rules for implementation will be documented, staffed, and finalized through the DLMS configuration management process. Some transactions on this list may be removed if there is no business requirement.

DLMS Supporting Passive RFID

- **856 Advance Shipping Notice**
- **856R Shipment Status Material Returns**
- **856S Shipment Status**
- **XML Reader Registration**
- **XML Visibility Response**
- **XML Visibility**

Example of Providing In The Box Visibility via 856 ASN

- Provide receiving activity with in the box visibility of an incoming shipment at the time of shipment.
- Computer system supporting the packing/shipping function builds out the 856 ASN.
- As the packer scans items and the Box & Pallet RFID Tags the system builds the Loops.
- The system receiving the 856 ASN decomposes the hierarchical structure to convey in the box information for use upon physical receipt.

Illustrative Example of IUID and pRFID Transmissions via 856 ASN

The 856 ASN uses a hierarchical structure to convey information and establish relationships:

- Between the shipment/contract and the individual line items which compose the shipment
- Between the CLIN and the uniquely identified items associated with the CLIN
- Between the tagged containers (case or pallet) and the number of items and the UIIs of uniquely identified items they contain
- Between tagged containers (cases on a pallet)

IUID and RFID in 856 ASN

The HL loops are defined as Shipment (DD 250 level) (HL03=S) Address (HL03=V), Line Item (HL03=I), IUID (HL03=D), embedded UII (HL03=E), and pRFID (HL03=P)

- **The IUID loop includes:**
  - ✓ **The SLN segment with IUID pedigree information: acquisition cost, unique item identifier (UII) type, enterprise identifier and original part number, when applicable**
  - ✓ **A separate REF with the UII and serial number for each item with the same pedigree in the SLN**
- **pRFID loop includes:**
  - ✓ **The REF with the RFID tag value and a separate REF for each UII, when applicable -- it tells you which items are in which container**
  - ✓ **The Destination Quantity (SDQ) with the CLIN and the Quantity of that line item packed under the RFID to which the SDQ is associated -- it tells you how many of which CLIN are identified to which RFID tag**

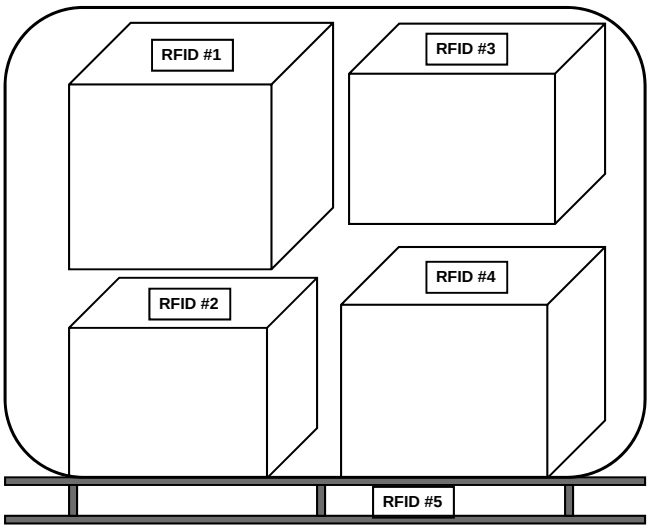
Multiple CLINs in Multiple Cases with Multiple CLINs per Case and Multiple Cases per CLIN on a Pallet

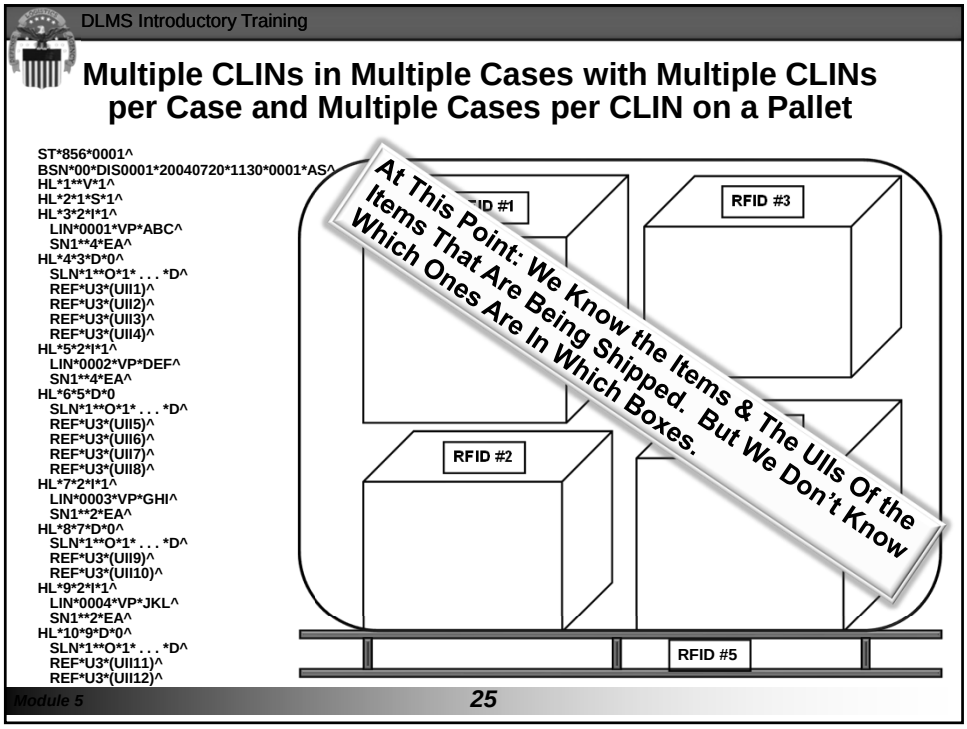
One Shipment Sitting on an RFID Tagged Pallet Containing

- **Four different Items with the notional FSNs:**
  - **ABC quantity of 4**
  - **DEF quantity of 4**
  - **GHI quantity of 2**
  - **JKL quantity of 2**
- **Each of the 12 items has a UII**
- **The Items are Packed in Four Boxes each with an RFID Tag**

Question: In advance of the Physical Receipt or upon Receipt Without Opening the Boxes, How Can We Determine:

- **Which UIIs are on which item &**
- **Which items are in which Box?**

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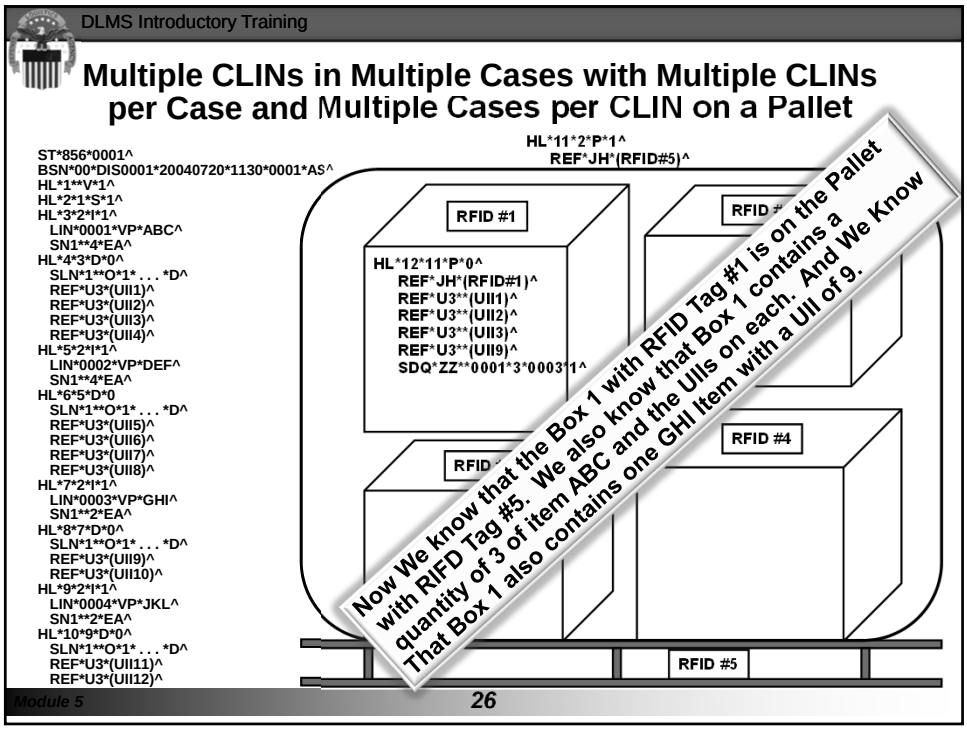
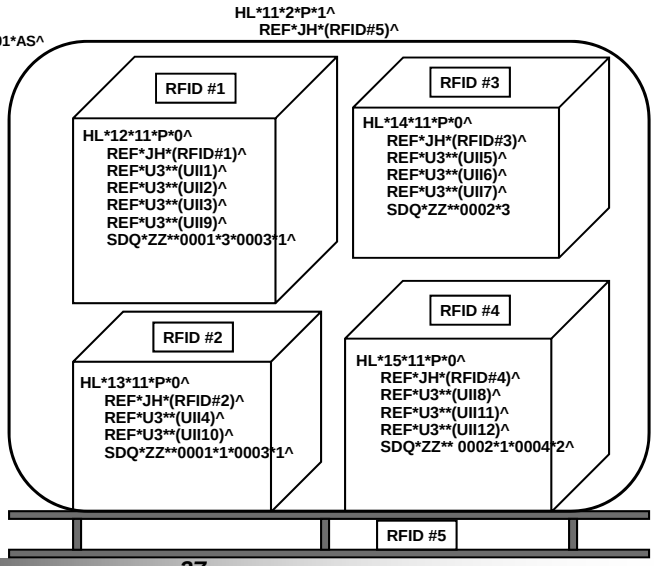
Multiple CLINs in Multiple Cases with Multiple CLINs per Case and Multiple Cases per CLIN on a Pallet
ST*856*0001^
BSN*00*DIS0001*20040720*1130*0001*AS^
HL*1**V*1^
HL*2*1*S*1^
HL*3*2*I*1^
LIN*0001*VP*ABC^
SN1**4*EA^
HL*4*3*D*0^
SLN*1**O*1*...*D^
REF*U3*(UII1)^
REF*U3*(UII2)^
REF*U3*(UII3)^
REF*U3*(UII4)^
HL*5*2*I*1^
LIN*0002*VP*DEF^
SN1**4*EA^
HL*6*5*D*0
SLN*1**O*1*...*D^
REF*U3*(UII5)^
REF*U3*(UII6)^
REF*U3*(UII7)^
REF*U3*(UII8)^
HL*7*2*I*1^
LIN*0003*VP*GHI^
SN1**2*EA^
HL*8*7*D*0^
SLN*1**O*1*...*D^
REF*U3*(UII9)^
REF*U3*(UII10)^
HL*9*2*I*1^
LIN*0004*VP*JKL^
SN1**2*EA^
HL*10*9*D*0^
SLN*1**O*1*...*D^
REF*U3*(UII11)^
REF*U3*(UII12)^
RFID #1
RFID #3
RFID #2
RFID #5
At This Point: We Know the Items & The UIIs Of the Items That Are Being Shipped. But We Don't Know Which Ones Are In Which Boxes.
Module 5
25


DLMS Introductory Training
Multiple CLINs in Multiple Cases with Multiple CLINs per Case and Multiple Cases per CLIN on a Pallet
ST*856*0001^
BSN*00*DIS0001*20040720*1130*0001*AS^
HL*1**V*1^
HL*2*1*S*1^
HL*3*2*I*1^
LIN*0001*VP*ABC^
SN1**4*EA^
HL*4*3*D*0^
SLN*1**O*1*...*D^
REF*U3*(UII1)^
REF*U3*(UII2)^
REF*U3*(UII3)^
REF*U3*(UII4)^
HL*5*2*I*1^
LIN*0002*VP*DEF^
SN1**4*EA^
HL*6*5*D*0
SLN*1**O*1*...*D^
REF*U3*(UII5)^
REF*U3*(UII6)^
REF*U3*(UII7)^
REF*U3*(UII8)^
HL*7*2*I*1^
LIN*0003*VP*GHI^
SN1**2*EA^
HL*8*7*D*0^
SLN*1**O*1*...*D^
REF*U3*(UII9)^
REF*U3*(UII10)^
HL*9*2*I*1^
LIN*0004*VP*JKL^
SN1**2*EA^
HL*10*9*D*0^
SLN*1**O*1*...*D^
REF*U3*(UII11)^
REF*U3*(UII12)^
HL*11*2*P*1^
REF*JH*(RFID#5)^
RFID #1
HL*12*11*P*0^
REF*JH*(RFID#1)^
REF*U3**(UII1)^
REF*U3**(UII2)^
REF*U3**(UII3)^
REF*U3**(UII9)^
SDQ*ZZ**0001*3*0003*1^
RFID #4
RFID #5
Now We know that the Box 1 with RFID Tag #1 is on the Pallet with RIFD Tag #5. We also know that Box 1 contains a quantity of 3 of item ABC and the UIIs on each. And We Know That Box 1 also contains one GHI Item with a UII of 9.
Module 5
26

Multiple CLINs in Multiple Cases with Multiple CLINs per Case and Multiple Cases per CLIN on a Pallet

```
ST*856*0001^
BSN*00*DIS0001*20040720*1130*0001*AS^
HL*1**V*1^
HL*2*1*S*1^
HL*3*2*I*1^
  LIN*0001*VP*ABC^
  SN1**4*EA^
HL*4*3*D*0^
  SLN*1**O*1* . . . *D^
  REF*U3*(UII1)^
  REF*U3*(UII2)^
  REF*U3*(UII3)^
  REF*U3*(UII4)^
HL*5*2*I*1^
  LIN*0002*VP*DEF^
  SN1**4*EA^
HL*6*5*D*0
  SLN*1**O*1* . . . *D^
  REF*U3*(UII5)^
  REF*U3*(UII6)^
  REF*U3*(UII7)^
  REF*U3*(UII8)^
HL*7*2*I*1^
  LIN*0003*VP*GHI^
  SN1**2*EA^
HL*8*7*D*0^
  SLN*1**O*1* . . . *D^
  REF*U3*(UII9)^
  REF*U3*(UII10)^
HL*9*2*I*1^
  LIN*0004*VP*JKL^
  SN1**2*EA^
HL*10*9*D*0^
  SLN*1**O*1* . . . *D^
  REF*U3*(UII11)^
  REF*U3*(UII12)^
```



Module 5 Quiz

Question 1: Which of the following is a key advantage associated implementing and integrating IUID into supply chain processes?

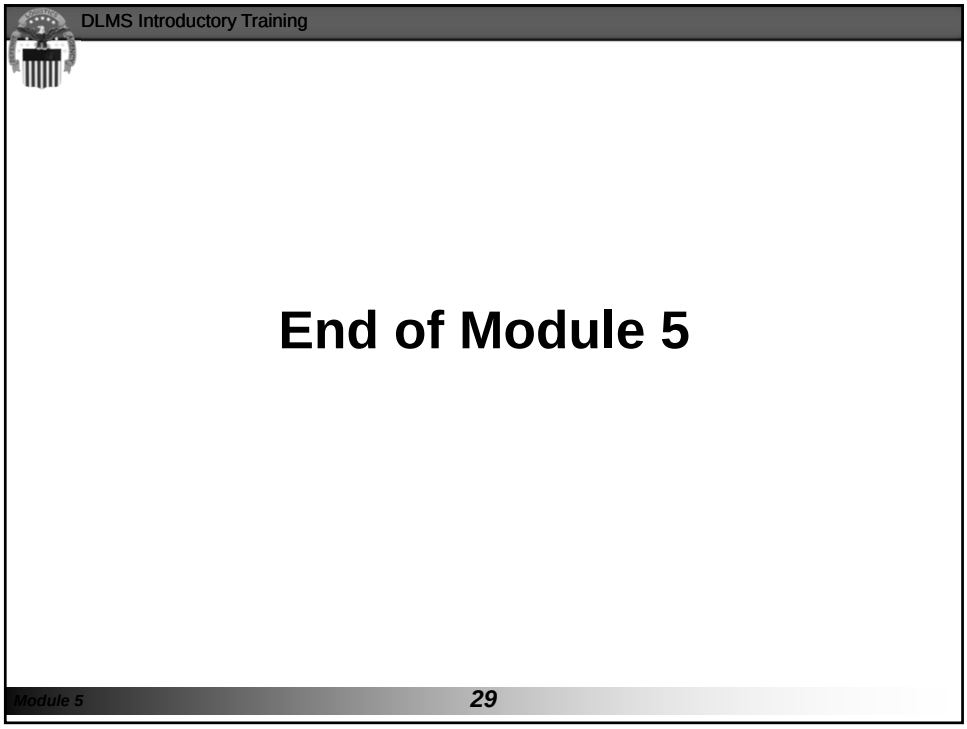
a) Enhance Total Asset Visibility; Improve Life-Cycle Item Management and Accountability; Improve Data Quality and Interoperability
b) Clean Audit Opinions on Property, Plant & Equipment, Operating Materials and Supplies
c) Both a & b

Question 2: What benefits does RFID provide to DOD?

a) Hands-off data capture
b) Improve Data Accuracy
c) Improve Logistics Processing Time
d) All of the above

Question 3: To improve material visibility across the supply chain which of the following technologies does DOD need to implement?

a) IUID
b) RFID
c) DLMS
d) All the above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End of Module 5
Module 5
29