

Using EPCglobal Network to track baggage around the world

Presented at EPCglobal US Conference 2005 on Sept 15, 2005 By Bernie Hogan (EPCglobal CTO) and Marc Linster (Avicon CEO)

Agenda

- The Problem
 - Baggage in the airline industry
- The Opportunity
 - Use EPC to improve baggage tracking
- The Collaborative Effort
- The Solution
 - TSA UHF Worldwide Interoperability Trial
 - BagTrackNet
- The Successes



The Baggage Problem in the Airline Industry

- \$1.6B/year spent on recovering, expediting and replacing lost or delayed baggage
- Almost 1% of checked baggage is delayed or lost
- Added security requirements since 9/11 require improved data management and processes
- Significant cost pressures on the Airline Industry will require improved operational efficiencies



Opportunity to Use EPC to Improve Baggage tracking

- Barcode readers have 70% - 80% read rate on airline Baggage tags
 - Tag orientation
 - Tag positioning



- Augment barcode read tunnels with RFID devices
- Translate between airline data standards (IATA Baggage license plate) and EPCglobal Standards
- Move from proprietary peer-to-peer communication networks to open standardized infrastructures (EPCglobal Network)
- TSA approached EPCglobal to explore possibilities of using EPC

The Collaborative Effort

- EPCglobal US partnered with
 - Transportation Security Administration (TSA)
 - Avicon
 - Incite! Consulting
 - Hummingbird Defense Systems
 - Kellam Group
 - Mightycard
 - Symbol
 - Wyle Labs





The Solution



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The TSA UHF Worldwide Interoperability Trial

- Q2/Q3 2005
- 40+ days
- United Airlines, China Air, Kenya Air
- Beijing, Narita, Nairobi, Chicago O'Hare, Amsterdam Schipohl





Achievements

- EPCglobal Network provides transparency in an open, multi-vendor architecture
- EPCglobal framework allows for very quick network implementations
- EPCglobal tag data standards are applicable to baggage tracking
- EPC Gen 1 tags achieve phenomenal read rates (compared to bar codes)
- EPCglobal Network is a global solution



IATA Bag Numbers as EPC Codes

- 10 digit IATA Bag Number
 - 1 digit prefix to indicate general classification of tag
 - 3 digit airline ticket number (e.g. 999 for China Air)
 - 6 digit serial number
- 96 bit EPCglobal Serialized Bag Tag Number (proposal not ratified!)

Header 8 bits	Filter 8 bits	Company Prefix 12 bits	Item Ref 4 bits	Serial Number 40 bits	Reserved 24 bits
	0	999	8	1	0
001111111	00000000	001111100111	1000		

- Namespace: SBTN
- 8 bit header (00111111) identifies a IATA Baggage Tag
- 12 bit company prefix uses the IATA Airline Ticketing number
- 4 bit item reference identifies the General Classification of the tag
- 40 bit serial number translates the 6 digit serial number of the IATA tag (in the final standard we propose to pre-pend 16 bits to include the date the tag was issued to make the serial number unique this feature is **not** used during the TSA pilot)
- 24 bits are reserved for future use

Read Rates Achieved with EPC Tags



Read rates

- PEK: **98.6%**
- NRT: 99.3% (excluding misleading results due to process problems)
- Total tags issued:
 3422

Disclaimer:

The results (read rates) presented as part of the EPCglobal pilot do not represent the official TSA test results. The TSA results involve a complete analysis of raw data, notes, and electronic communications to determine the final read rates. Some of this information was not available to EPCglobal therefore; these results may differ from the official TSA results.

BagTrackNet – Efficient Transparency in a Multi- Vendor Environment

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- Integrates RFID read data from Beijing and Narita
- Interacts with local EPCIS via standard EPC event format
- Implementation and deployment within four weeks
- EPC standards provide powerful platform for multivendor solutions (Wyle Labs, Hummingbird Defense Systems, Mightycard, Symbol, EPCglobal US, Avicon)



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BagTrackNet – The Framework





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Summary

- EPCglobal Network provides transparency in an open, multi-vendor architecture
- EPCglobal standards are open, easily extensible and adaptable to new problems, new industries and new supply chains
- EPCglobal Network created foundation for fast implementation (< six weeks) of visibility and track/trace infrastructure
- EPC provides significant value to baggage tracking in the airline industry
- The Baggage Tracking Pilot provides approaches to solving the Track and Trace issue in other industries
- EPCglobal Network is a GLOBAL solution!

