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Integrating Active and Passive in the End to End Supply Chain

3 April 2007

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EPCglobal Standards Director





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Integrating Active and Passive Objectives of this session

- Outline of EPCglobal Transportation and Logistics Action Group Pilot
- Illustrate the use of Active and Passive Tags in the Pilot – Phase 1
- EPCglobal Standards Development
 - Standards in progress





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EPCglobal Transportation and Logistics PILOT

INTRODUCTION





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EPCglobal TLS Pilot – Phase 1 Hong Kong to Japan

1. Demonstrate interoperability among multiple trading partners and service providers in a global supply chain using EPC/RFID technology including Active and Passive tagging and GS1 standards
2. Provide the foundation for the larger Global Transportation and Logistics Pilot (Shanghai – Long Beach) using active RFID technologies.
3. EPC/RFID and shipment info used across industries (transportation and logistics/ apparel and footwear)
4. Prepare and investigate shipment info used for import/export declaration





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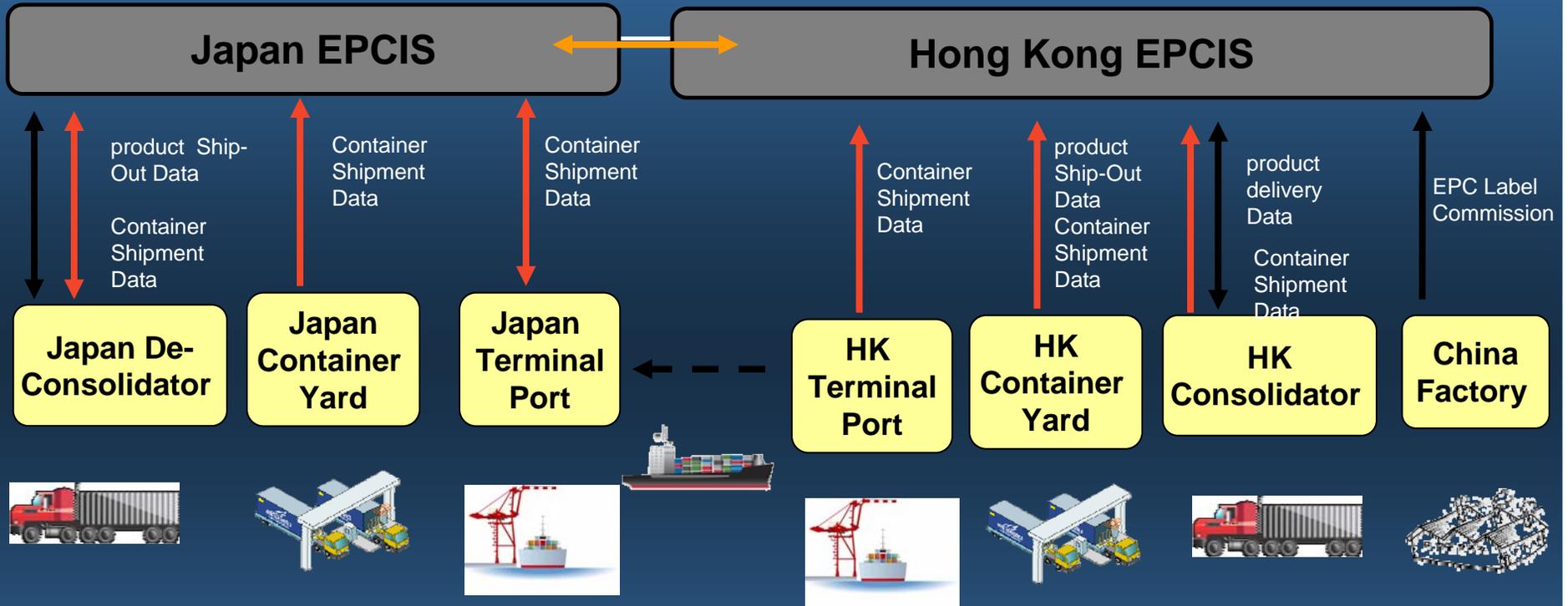
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Global Pilot Phase I

EPC Data Interchange / Event Query



Legend:

↑ Passive Tag event ↑ Active Tag event





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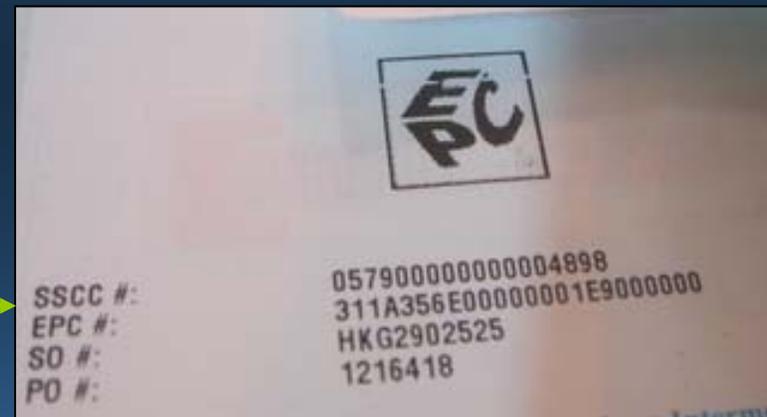
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Use of GS1 Keys – Serial Shipment Container Code

- Use of SSCC:
 - SSCC# is applied on each carton box tagging, it is translated and store as EPC number.





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Use of GS1 Keys – Global Location Number

ATL Logistics Centre
(Hong Kong)



- Use of GLN:
 - GLN# of consolidators, de-consolidator, Terminal ports in both Hong Kong and Japan are assigned. It is used to EPCIS query and EPC business location identification.

**NYK TOKYO
CONTAINER TERMINAL**



Maersk Logistics warehouse
(Hong Kong)

Shipper Warehouse (Japan)





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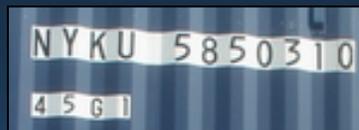
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Use of GS1 Keys – Global Returnable Asset Identifier

- Use of GRAI:
 - GRAI# is used for container level tagging. ISO container # is translated into GRAI 170 format and store as EPC number.



urn:epc:id:grai:579000.999999.NYKU5850310





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Details for Phase I Pilot

- Carton level shipments tracking using both passive EPC Gen 2 UHF RFID tags and Container level tracking using SIO and SAVI Active tag (433mHz).
- Japan's Ministry of Economics, Trade and Industry (METI) is providing financing for the pilot Phase I.
- Pilot Phase I completed on February 07.
- Tracking from a Maersk Logistics warehouse, ATL Logistics center, Modern Terminal port in HK, Tokyo port and shipper warehouse in Japan.





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Details for Phase I Pilot (Cont'd)

- Containers, cartons in Hong Kong transporting clothing items for an unnamed manufacturer will be tagged and read in Hong Kong.
- All EPC events are sent to Hong Kong EPC Information Services (EPCIS) and Japan.
- Demonstrate the core level of interoperability between both EPCIS in Hong Kong and Japan.





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Result of Phase I Pilot

- All passive and active reading were successfully captured and queried between the Hong Kong EPCIS and Japan EPCIS
- EPC events and data are fully conformed to the design xml data structure under EPCglobal standard
- Achieve very high passive read rate in each read point.





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EPCglobal Standards





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EPCglobal Standards Development

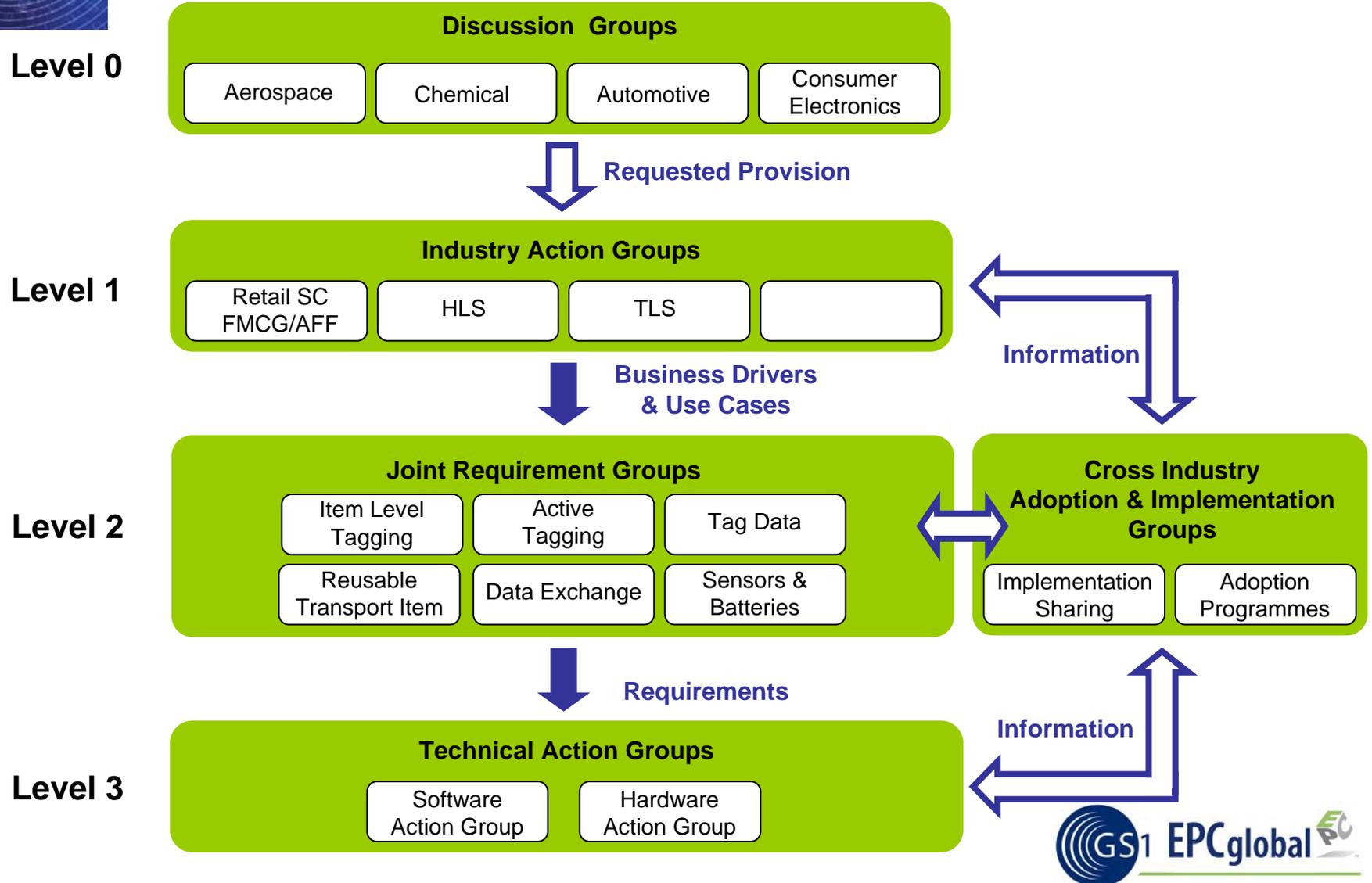
Divided into two parts:

- **Requirements Development**
 - where User Requirements are developed from input from the Industry Action Groups and other industries with guidance from Solution Providers
- **Standards Development**
 - where approved User Requirements are developed into technology standards





EPCglobal Standards Development





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EPCglobal Standards Development in progress

- EPCIS Data Sharing Standard – Ratification expected this month
 - Data Sharing regardless of data capture
- Item Level Tagging Standards
 - HF and UHF Gen 2
- Requirements - TLS Conveyance Asset Tag (CAT)
 - Passive
 - Permanent and Conveyance identifier written once
- Requirements - TLS Extended Conveyance Asset Tag (XCAT)
 - Active
 - Written to many times
 - Data captured at each event can be written to tag memory and read many times
- Requirements for Sensor and Batteries





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What is EPCIS?

- Industry and Application Neutral
 - Cross-industry framework
 - Cross-industry and industry-specific vocabularies and extensions
 - User-extensible
 - Allows each trading partner to keep their data
- Secure information exchange
 - Everyone controls their data and shares it only with those they choose to share it with
 - Leverages established security mechanisms
- A supplement to, not a replacement for, existing enterprise information systems
 - Complementary to EDI





What is EPCIS Data?

EPC Events answer 4 questions – *What, Where, When, and Why*

What	<ul style="list-style-type: none">• EPC number (can leverage master data - GTIN)• Sensor related data• Manifest data
Where	<ul style="list-style-type: none">• Location (can be fixed or moving – leverage master data - GLN)
When	<ul style="list-style-type: none">• Event Time• Record Time
Why	<ul style="list-style-type: none">• Business Process Step – e.g.: Receiving, Shipping• Product State – e.g.: Saleable, Active, In Transit• Current Conditions – e.g.: Temperature

The EPCIS standard enables sharing of data regardless of how it

Is captured





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EPCIS can work with any data carrier

- Identification that can be captured may come in the form of:
 - Passive RFID Tag – UHF Gen 2, HF
 - Barcodes – Linear, Data Matrix
 - Active RFID Tag
 - Human Readable Number
 - And more in the future!





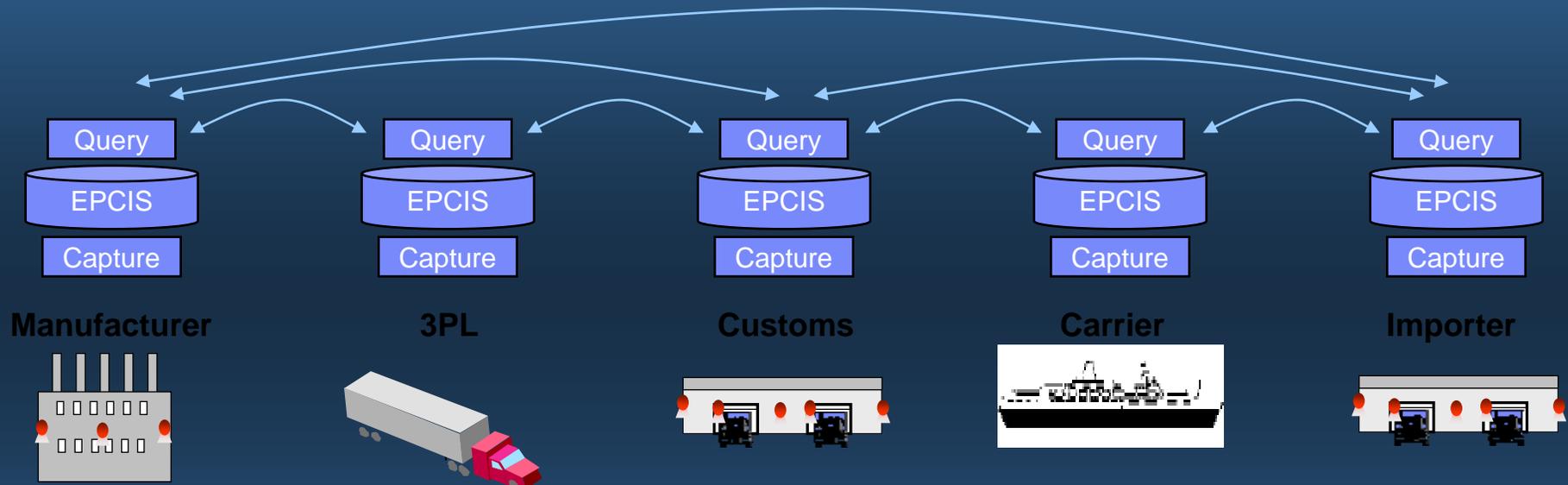
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How does EPCIS Data Sharing work?





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Summary

- All passive and active reading can be successfully captured and queried between EPCIS's
- Active and passive tags can be easily integrated and utilized based on the unique functionality that each provides

