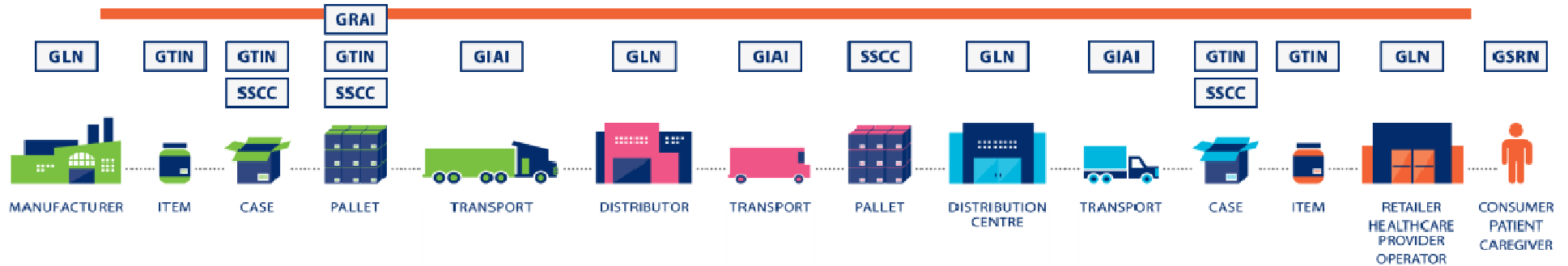


Identify – Capture – Share

IDENTIFY: GS1 Standards for Identification

GLN Global Location Number **GTIN** Global Trade Item Number **SSCC** Serial Shipping Container Code **GRAI** Global Returnable Asset Identifier **GIAI** Global Individual Asset Identifier **GSRN** Global Service Relation Number



CAPTURE: GS1 Standards for Barcodes & EPC/RFID

GS1 BARCODES

EAN/UPC



GS1-128



ITF-14



GS1 DataBar



GS1 DataMatrix



GS1 QR Code

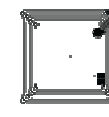


GS1 Composite Barcode



GS1 EPC/RFID

EPC HF Gen 2



EPC UHF Gen 2



SHARE: GS1 Standards for Data Exchange

MASTER DATA Global Data Synchronisation Network (GDSN) **TRANSACTIONAL DATA** eCom (EDI) **Event Data** EPC Information Services (EPCIS)



The Global Language of Business

© GS1 2015

The “Share” Layer of GS1 Standards

Master Data

- example: weight & physical dimensions of trade item class
- GS1 “Share” Standard: GDSN

Transactional Data

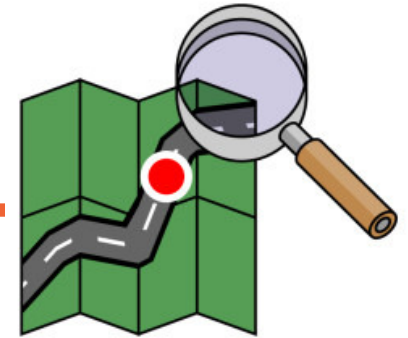
- Example: ORDERS, INVOIC
- GS1 “Share” Standards: GS1 XML, EANCOM

Visibility Event Data

- Physical activity in the supply chain of products and assets
- GS1 “Share” Standard: EPCIS



EPCIS . . .



- is a GS1 standard within GS1's "Share" layer
- is not a product, service or out-of-the box solution
- defines technical interfaces for capturing/sharing data
- defines a framework data model for event data
- helps create & share visibility data within/across enterprises
- is an **enabler** around which to build value-added services and solutions for supply chain **visibility** & asset management
- was updated with the May 2014 release of EPCIS 1.1
 - *including support for Lot/Batch-based event data*
- when used in a GS1 context, leverages GS1 Keys as the "**what**" and "**where**" of visibility events



Core Business Vocabulary (CBV)

another GS1 "Share" standard



- Companion standard to EPCIS
- Supplements EPCIS' framework data model
- Defines specific data values to populate EPCIS data model
- Specifies vocabulary elements & values for EPCIS
- Ensures a common understanding of data semantics
- **Critical to interoperability of EPCIS implementations**
- Includes values & definitions for Standard Vocabularies
- Provides identification syntax rules for *User Vocabularies*



Four dimensions of an EPCIS event

WHAT objects are the subject of event?

Individual objects (SGTIN) or groupings (GTIN + Lot/batch)

WHEN did this event take place?

Date, time, time zone

WHERE did this event take place?

GLN of physical location & object's subsequent whereabouts

WHY did this event take place?

Business step, Disposition (status), Source/Destination info



EPCIS events

“WHAT” dimension

- Specifies what objects participated in the event
- Can be physical or digital objects
- EPCIS allows for two kinds of object identification:
 - Instance-level
each identifier is unique to a single object
 - Class-level
multiple objects carry the same identifier



EPCIS events - "WHAT" dimension

Instance-level identification

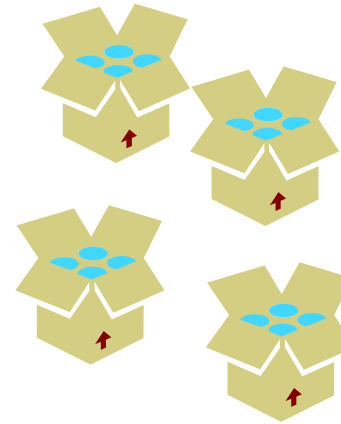
- **SGTIN** Serialized Global Trade Item Number
- **SSCC** Serial Shipping Container Code
- **GRAI** Global Returnable Asset Identifier
- **GIAI** Global Individual Asset Identifier
- **GSRN** Global Service Relation Number
- **GDTI** Global Document Type Identifier
- **ADI** Aerospace & Defense Identifier
- **CPID** Component Part Identifier + serial
- **SGCN** Serialized Global Coupon Number



EPCIS events - “WHAT” dimension

Class-level identification

- **GTIN** Global Trade Item Number
- **GTIN + Lot/ Batch**
- **GRAI** without serial
- **GDTI** without serial
- **GCN** without serial
- **CPID** without serial



Batch/Lot vs. Serialized: Visibility with differing granularity

Feature	GTIN	GTIN + Lot	GTIN + Serial
Low Precision Identification	✓		
Medium Precision Identification		✓	
High Precision Identification			✓
Additional data needs to be physically marked		✓	✓
Serialization required			✓
Traceable item exist in multiple locations at the same time	✓	✓	
Traceable item exist only at one locations at the same time			✓
Product Recall	All units of a given GTIN	All units of a given GTIN + Lot	Only specific units with matching GTIN + Serial
Enables anti counterfeit measures			✓
Enables to monitor products with finite shelf life		✓	✓

EPCIS events

“WHEN” dimension

- **Date of event**

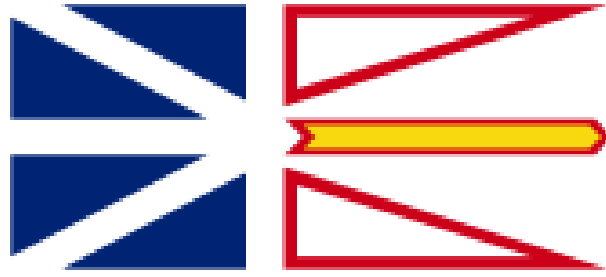
example: 2015-04-22

- **Time of event**

example: 15:52:00

- **Time zone**

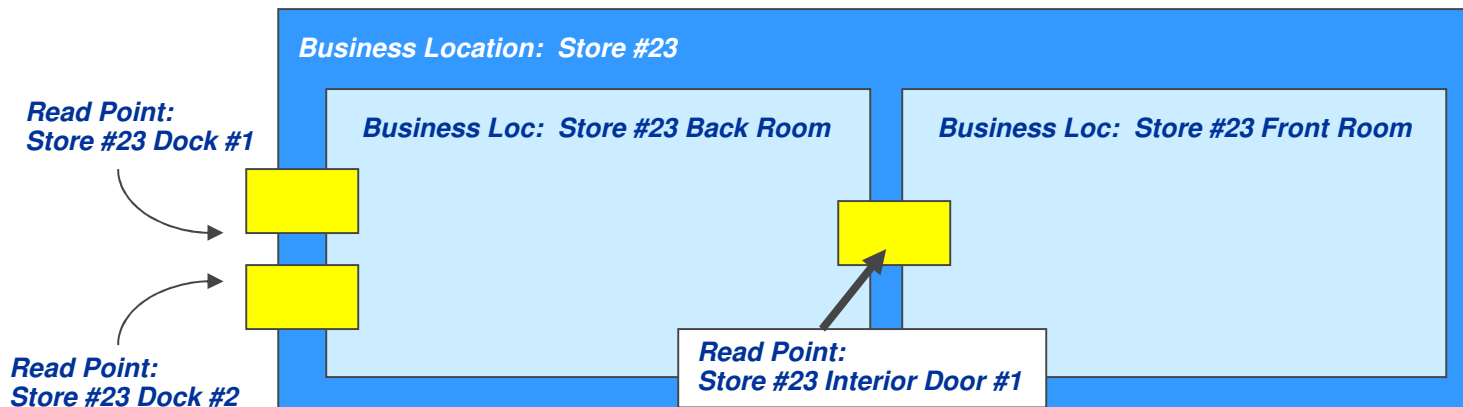
example: -03:30



EPCIS events

“WHERE” dimension

- **Read Point**
 - specific place that an event took place
 - identified by SGLN
- **Business Location**
 - place the object is assumed to be following the event
 - identified by SGLN



The “WHY” dimension of EPCIS events

Business Step

- Business process context of event
e.g.: Commissioning, Packing, Shipping, Unpacking

Disposition

- Status of object subsequent to event
example: active, in_transit, sold, expired, recalled

Business Transaction

- Link to transaction information

Source/Destination

- Transfer of ownership or possession



EPCIS event types

Object Event

- Observation of (or assertion about) object(s)

Aggregation Event

- Association between containing/contained object(s)

Transaction Event

- (Dis)Association of object(s) to business transaction(s)

Transformation Event *(new in EPCIS 1.1)*

- Object(s) consumed as inputs, produced as outputs



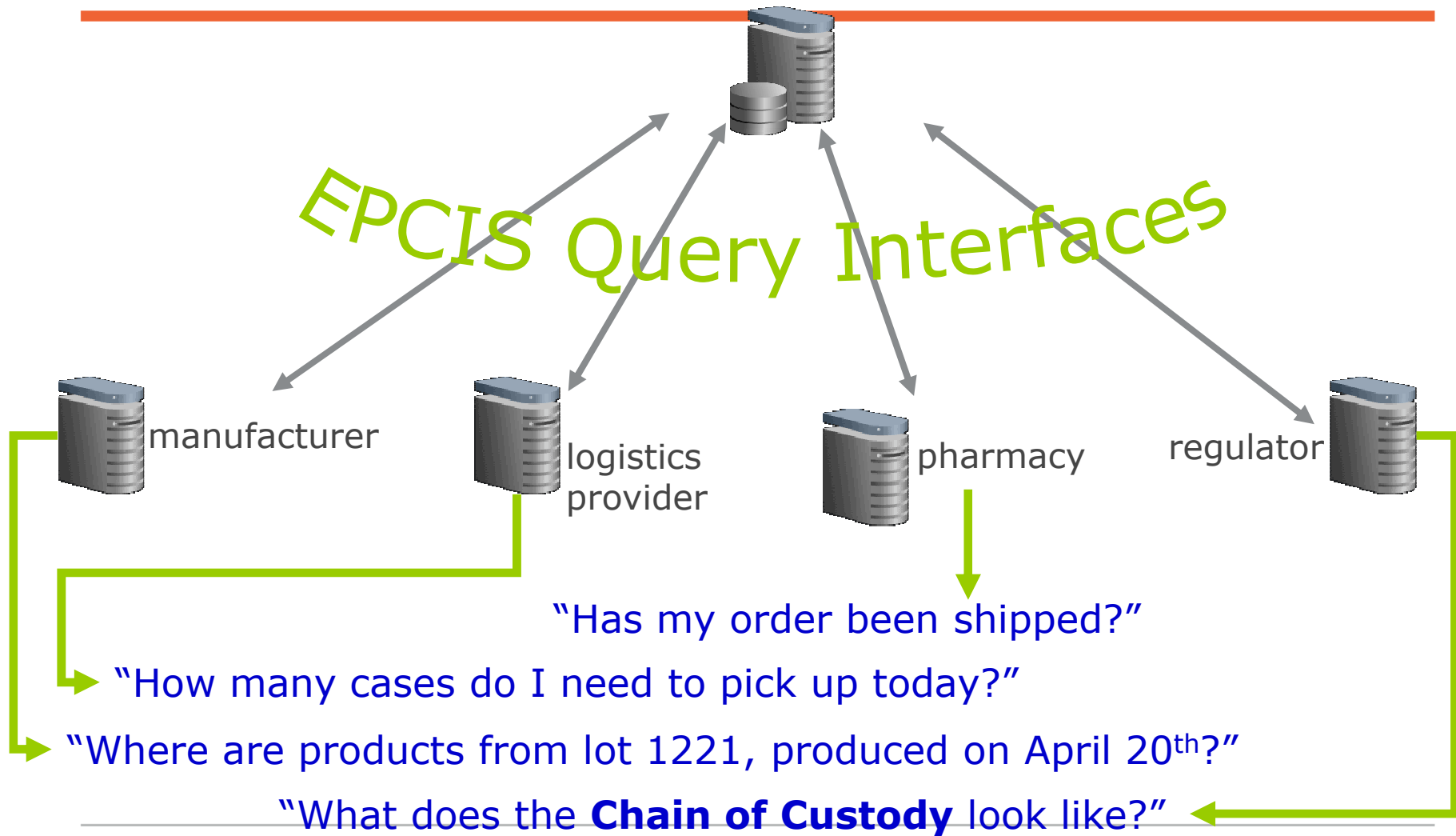
EPCIS event types

Aggregation Event

- Applied to set of contained/containing objects
- Strong physical relationship between containing/contained
- Action ADD:
 - Child objects aggregated to parent
 - Creation of new aggregation or addition of new children
- Action OBSERVE:
 - Observation of an aggregation (may be incomplete)
- Action DELETE:
 - Objects have been **disaggregated** from parent
 - Removal of subset of children or entire aggregation

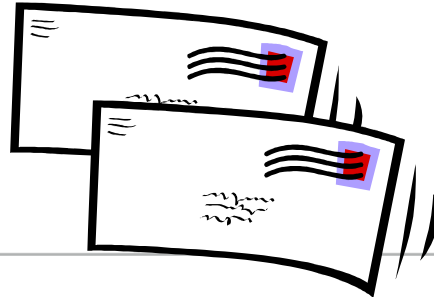


Leveraging the EPCIS Query Interfaces



Visibility applications enabled by EPCIS

- Which parties have had contact with my shipment?
- When will the new vaccine be delivered?
- (When) was my shipment received by the recipient?
- Where was medication produced on April 11th shipped to?
- Which defibrilators are located where in the hospital?
- Where is all of the radioactive material at the clinic?



EPCIS implementations 2015 and beyond

- **Food / Fresh Produce** Packaging and Distribution
- Fresh **Fish** Packaging and Distribution
- Vehicle Visibility in **Rail**
- Digital **Coupon** Management in retail
- RTI management
- Asset management (tool/equipment inventory in **Oil/Gas**)
- **Tobacco** chain of custody
- **Apparel** Stock-Taking & Cycle Counting
- **Pharmaceutical** chain-of-custody

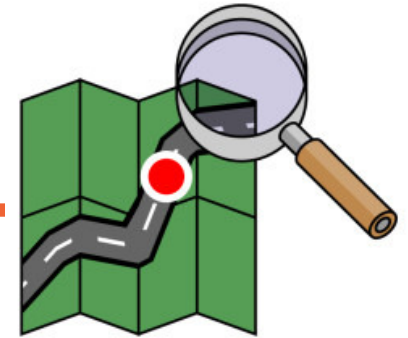


Certified EPCIS 1.0 solution providers

- Axway
- Covectra Inc.
- Dongguk University
- ECO, Inc.
- ETRI
- FastPoint Technologies
- Fosstrak Project (Auto-ID Labs)
- Hanmi IT
- IBM
- KTNET
- LG CNS CO., LTD.
- LG Hitachi
- LIT
- MetaBiz, Inc
- MetaRights, Ltd
- Microsoft
- NEC Corporation
- Nippon Telegraph & Telephone
- Samsung SDS
- SAP
- Serno Solutions Corp
- Smartag Solutions Berhad
- T-Systems International GmbH



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For further information on EPCIS...

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