ISO/IEC JTC 1/SWG 5
Internet of Things (IoT)
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GS1 contribution to ISO/IEC JTC 1/SWG 5

6 March 2013

GS1: Global reach, local presence

GS1 is a not-for-profit organization dedicated to the design and implementation of **global standards** and solutions to improve the efficiency & visibility of the **supply and demand chains** globally and across sectors

111 Member Organisations
1,5 million member companies

Countries with a GS1 Member Organisation

Countries served directly by GS1 Global Office

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Historical milestones (1/2)

1973, 3rd April Industry leaders select a single standard for product identification (Universal Product Code symbol)
1974, 26th June First live scan of a GS1 bar code on a Wrigleys gum in a Marsh supermarket in Ohio, USA
1977 Establishment of the European Article Numbering Association (GS1) as not for profit international association with Head Office in Brussels with 12 founding Member Organisations from European countries
1989 Supply chain applications expansion of GS1 standards to logistics units with UCC/EAN-128. First version of the EANCOM Manual released, an international standard for Electronic Data Interchange.

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Historical milestones (2/2)

1996 Launch of SC31, the ISO committee for automatic identification and data capture standards
1999 Launch of the Auto-ID Centre at the Massachusetts Institute of Technology, leading to the development of the Electronic Product Code
2003 GS1 forms EPCglobal and initiates the development of the EPCglobal architecture and standards
2005 Worldwide launch of GS1, the new name for the organisation.
2013 GS1 celebrates 40th anniversary of the bar code.GS1 presence in 111 countries.

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Internet of Things

- The term was first used by Kevin Ashton in 1999
- Kevin came from P&G and was appointed director of the Auto-ID Center at MIT from 1999 to 2003
- The Auto-ID Center developed the EPC concept
- On November 1st, 2003, GS1 was appointed by the Auto-ID Center to develop the EPC standards and drive implementation

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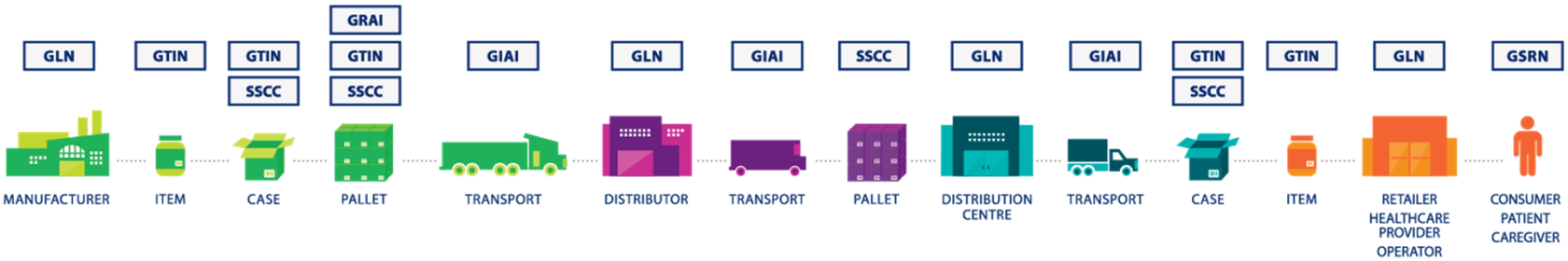
The GS1 System Architecture

Identify > Capture > Share

GS1 Standards

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 **GS1 EPC/RFID**

EAN/UPC GS1-128 ITF-14 GS1 DataBar GS1 DataMatrix GS1 QR Code GS1 Composite Barcode 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)

INTEROPERABILITY

ITEM MASTER DATA | LOCATION DATA | ITEM/SHIPMENT TRACKING | TRACEABILITY | PRODUCT RECALL/WITHDRAWAL | PEDIGREE | PURCHASE ORDER/DESPATCH ADVICE/INVOICE

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GS1: Identify / Capture / Share

Share

Capture

Identify

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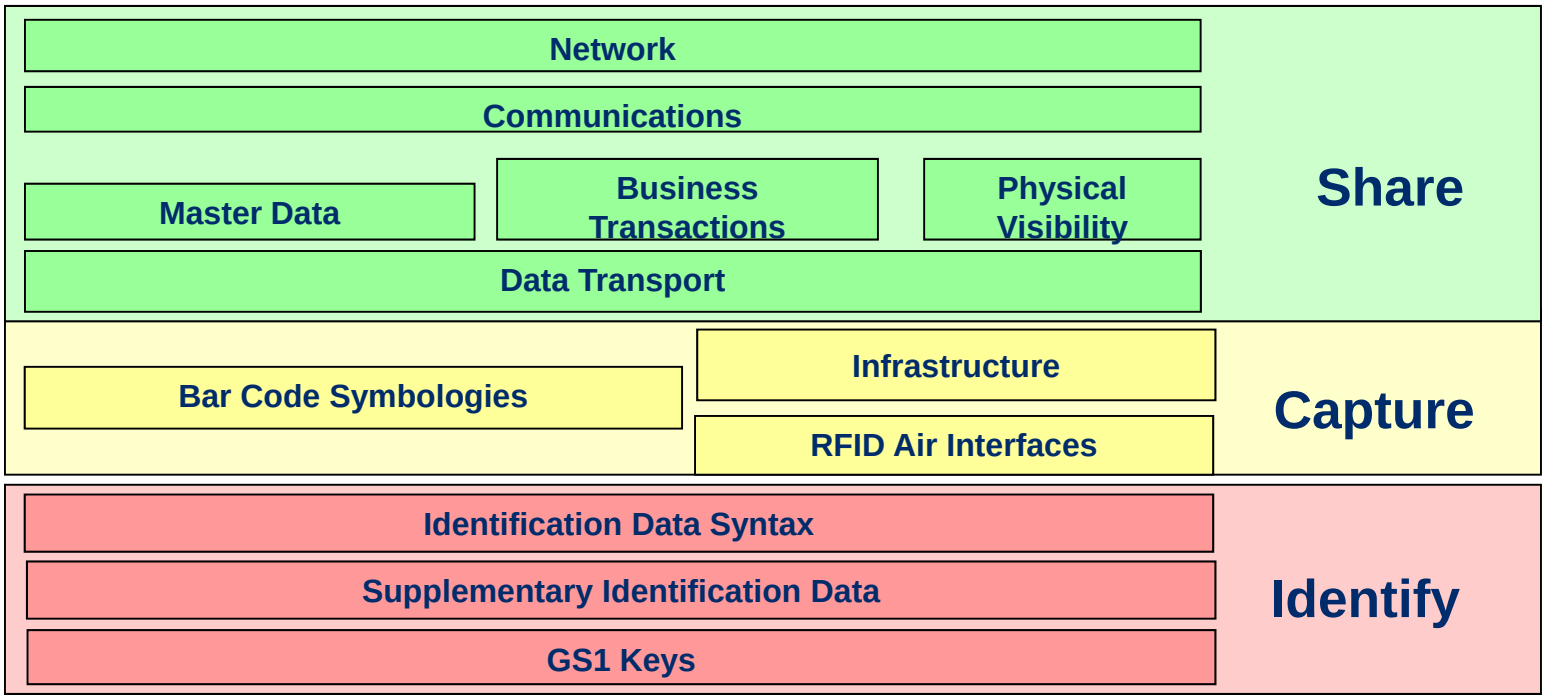
The GS1 System Architecture



Architectural view of how the components of the GS1 System fit together and the principles that underlie the entire system

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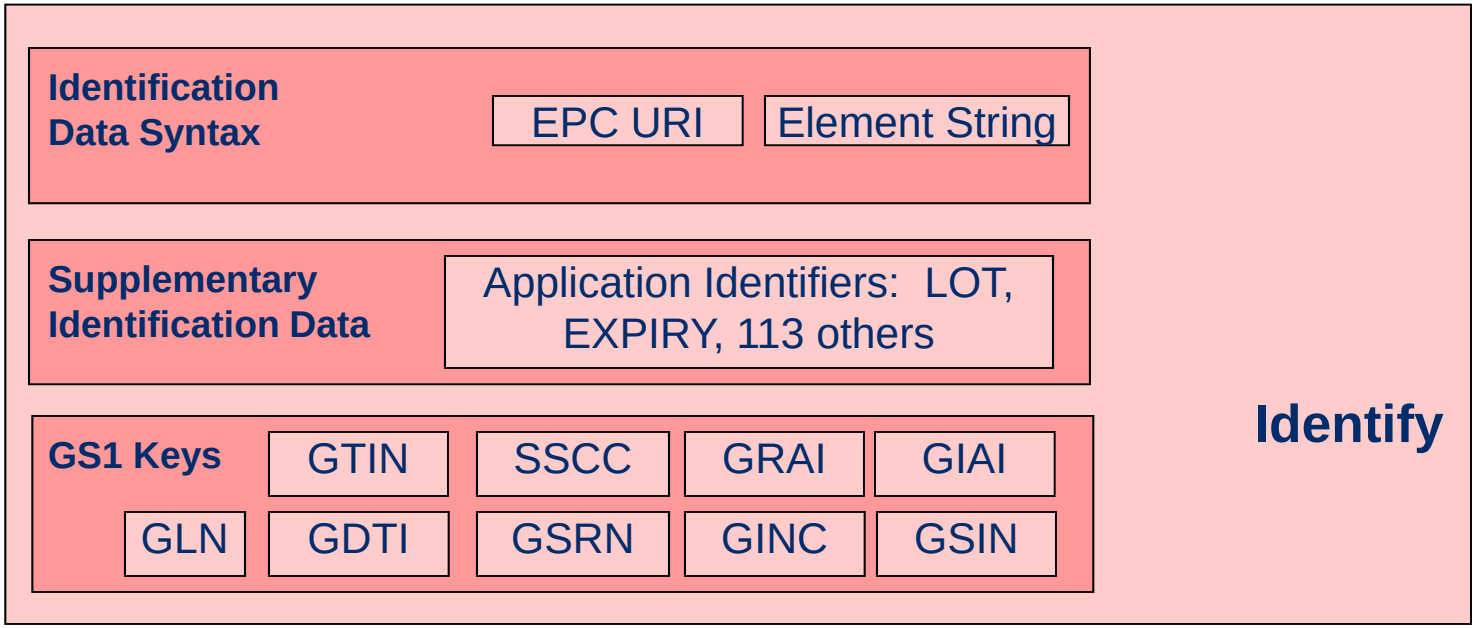
GS1 System Architecture – Identify



- GS1 Identification Keys and Supplementary Data
- Identifier syntax

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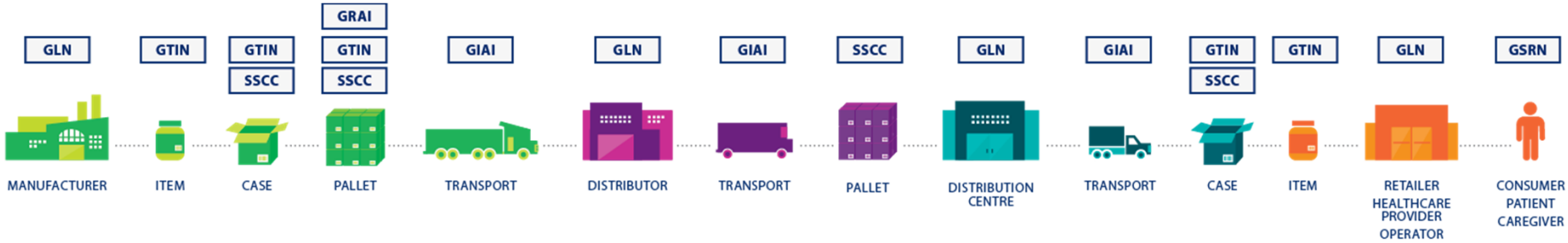
GS1 Identification Keys



COMPANY & LOCATION

Global Location Number (GLN)

PRODUCT

Global Trade Item Number (GTIN)

Serialised Global Trade Item Number (SGTIN)

LOGISTICS & SHIPPING

Serial Shipping Container Code (SSCC)

Global Shipment Identification Number (GSIN)

Global Identification Number for Consignment (GINC)

ASSETS

Global Individual Asset Identifier (GIAI)

Global Returnable Asset Identifier (GRAI)

SERVICES & MORE

Global Service Relation Number (GSRN)

Global Document Type Identifier (GDTI)

Global Coupon Number (GCN)

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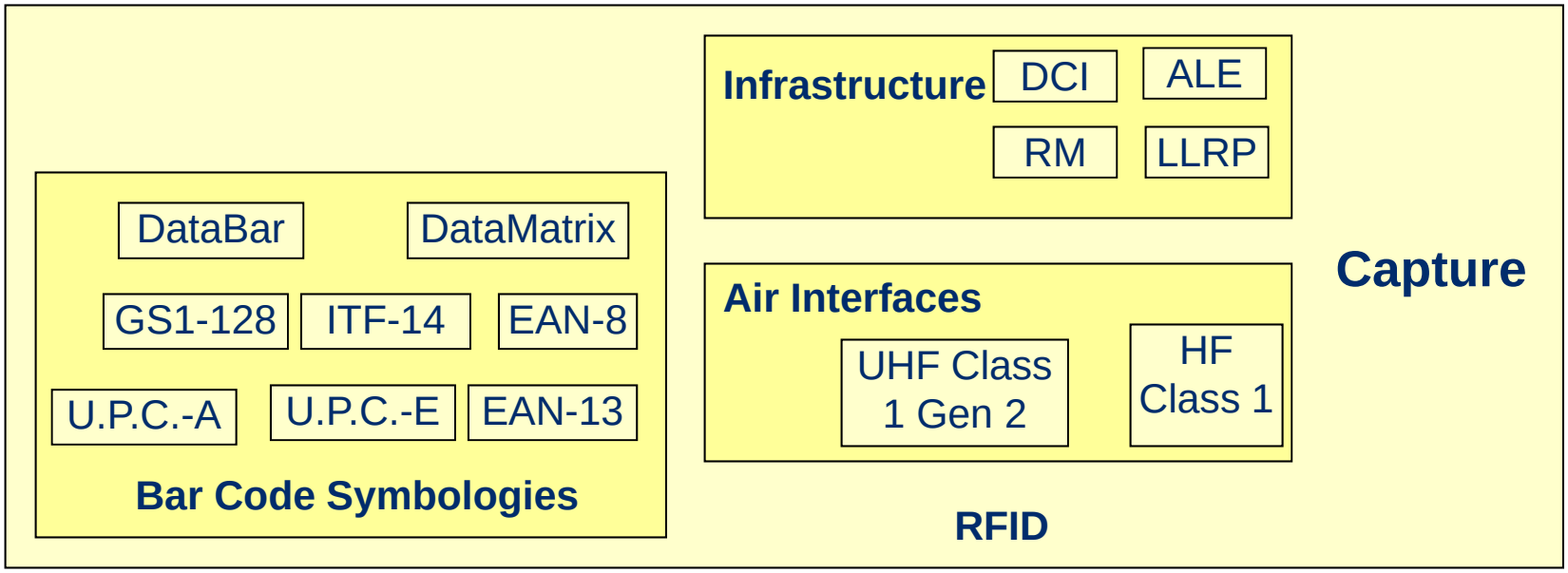
GS1 System Architecture – Capture



- Data Capture Architecture
- Data Carriers: bar code, RFID
- AIDC Data Translation
- Data Capture Infrastructure Standards
  - Bar code: symbology identifier, element string
  - RFID: LLRP, ALE, RM, DCI

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CAPTURE: GS1 Standards for Barcodes & EPC/RFID

GS1 Barcodes and EPC/RFID are data carriers for GS1 identifiers; but can also accommodate different needs such as batch/lot information and expiry dates.

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

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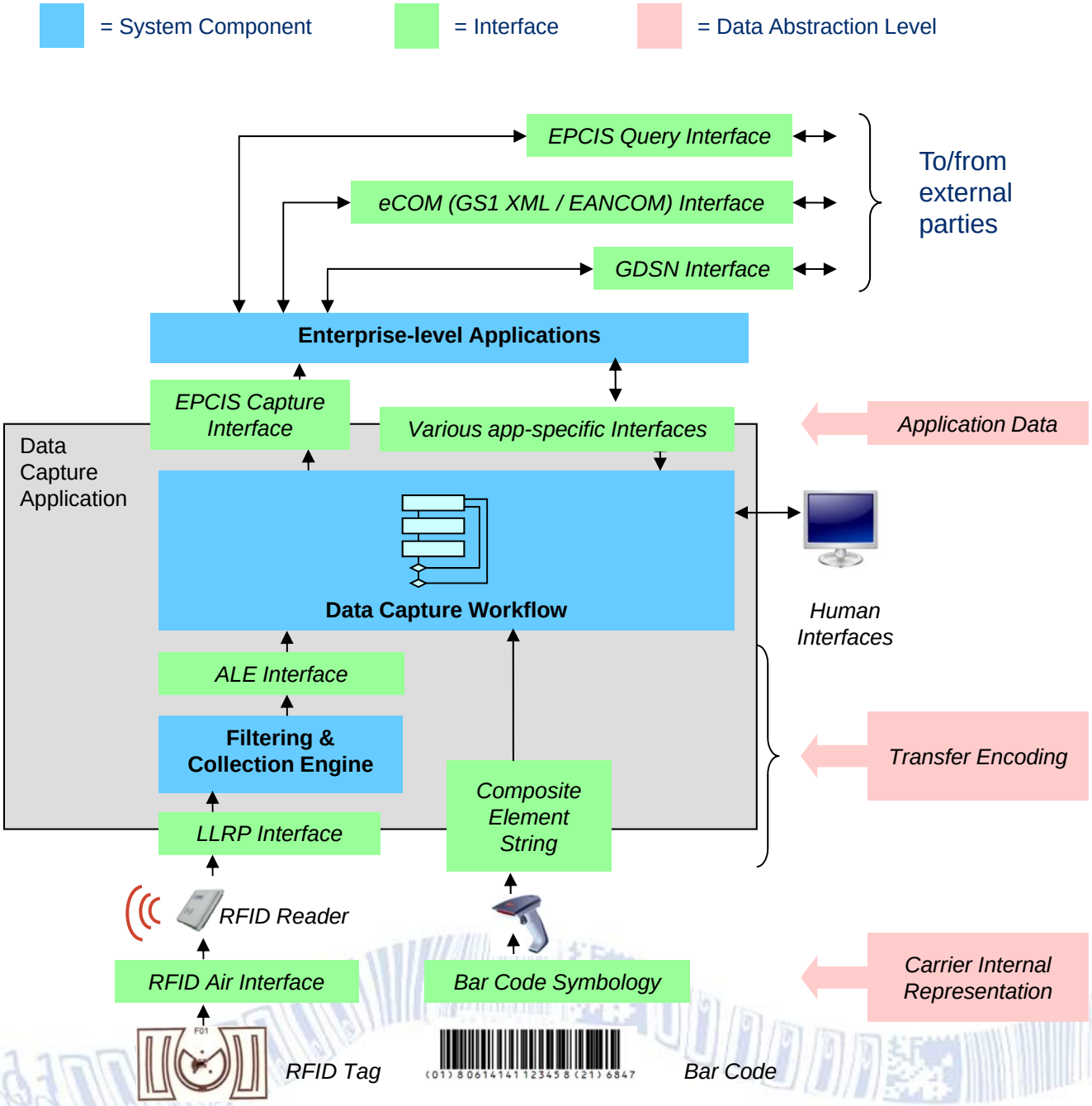
Data Capture Architecture



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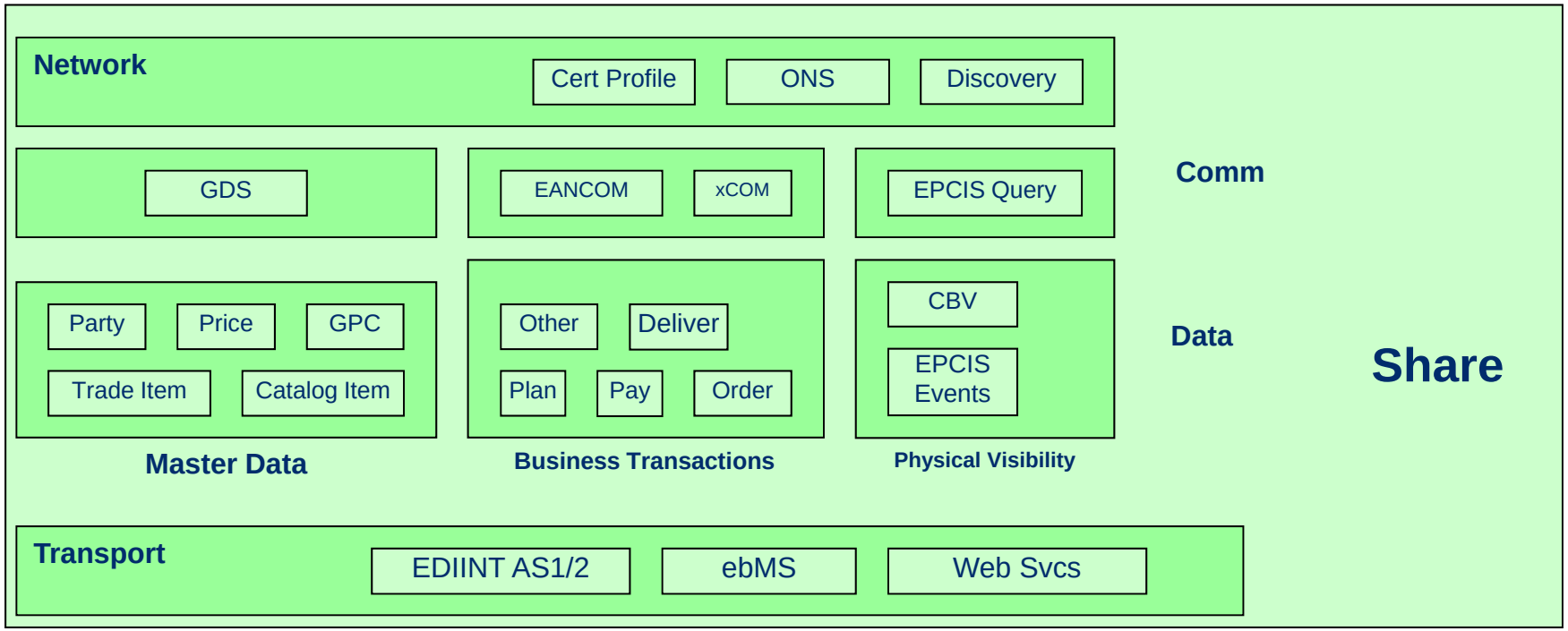
GS1 System Architecture - Share



- Content: Master data; Transaction Data; Visibility Event Data
- Data and service discovery: Prearrangement, ONS, Discovery services

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SHARE: GS1 Standards for Data Exchange

Interoperability, made possible by identification standards, data capture standards, and interface standards for electronic communication, allows product information to flow through the supply chain.

MASTER DATA

GDSN
Global Data Synchronisation Network

The GDSN connects trading partners to the GS1 Global Registry® via GS1-certified Data Pools, enabling automated electronic sharing of standardised, up-to-date, accurate, product information.

WHAT GOES INTO IT

GTIN, GLN
Brand Owner Identification
Product Descriptions
Global Product Classification (GPC)
Target Market

TRANSACTIONAL DATA

eCom
Electronic Communication

GS1 eCom standards provide clear guidelines for Electronic Data Interchange (EDI), enabling electronic sharing of accurate business transaction information between trading partners.

WHAT GOES INTO IT

GTIN, GLN, SSCC, GSIN, GINC, GDTI, GRAI, GIAI
Purchase Order
Despatch Advice
Transport Instruction
Invoice
Payment

EVENT DATA

EPCIS
Electronic Product Code Information Services

EPCIS is the standard for immediate sharing of information about critical events between trading partners. It provides evidence of what is occurring in the supply chain, and observations of the *what, when, where,* and *why.*

WHAT GOES INTO IT

What	SGTIN
Where	GLN
When	SSCC
Why	GIAI
	GRAI
	GSRN
	GDTI

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Transactions with GS1 eCom

Global standards for electronic business messaging

Rapid efficient & accurate business data exchange

- Global standards for electronic business messaging
- Rapid, efficient and accurate automatic electronic transmission of agreed business data between trading partners all along the supply chain
- Improved efficiency and visibility in the supply chain

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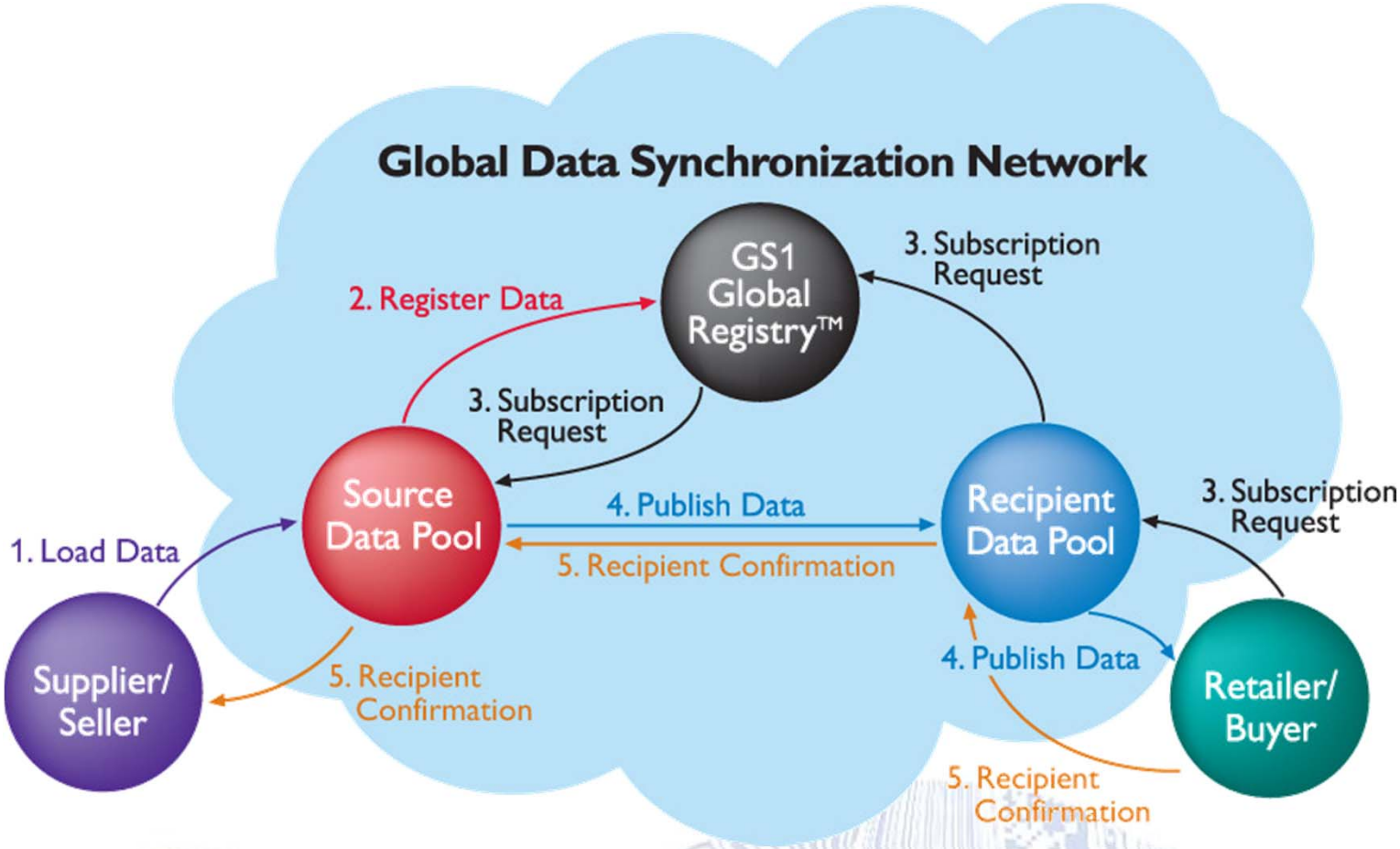
Synchronizing product master data with GDSN



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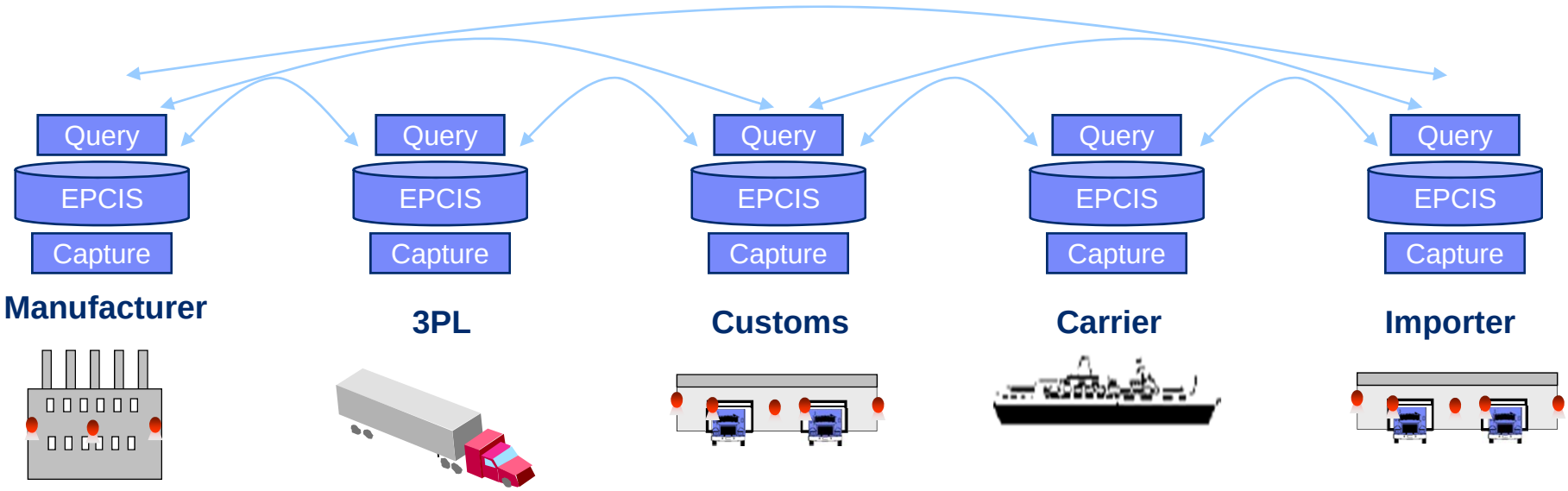
Sharing Visibility data with EPCIS

- Each company controls their own data – share via EPCIS Query Interface, subject to access rights



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