



GS1 RFID Standards in Rail

RFID in Rail –
Stockholm 2011-02-16





Sweden

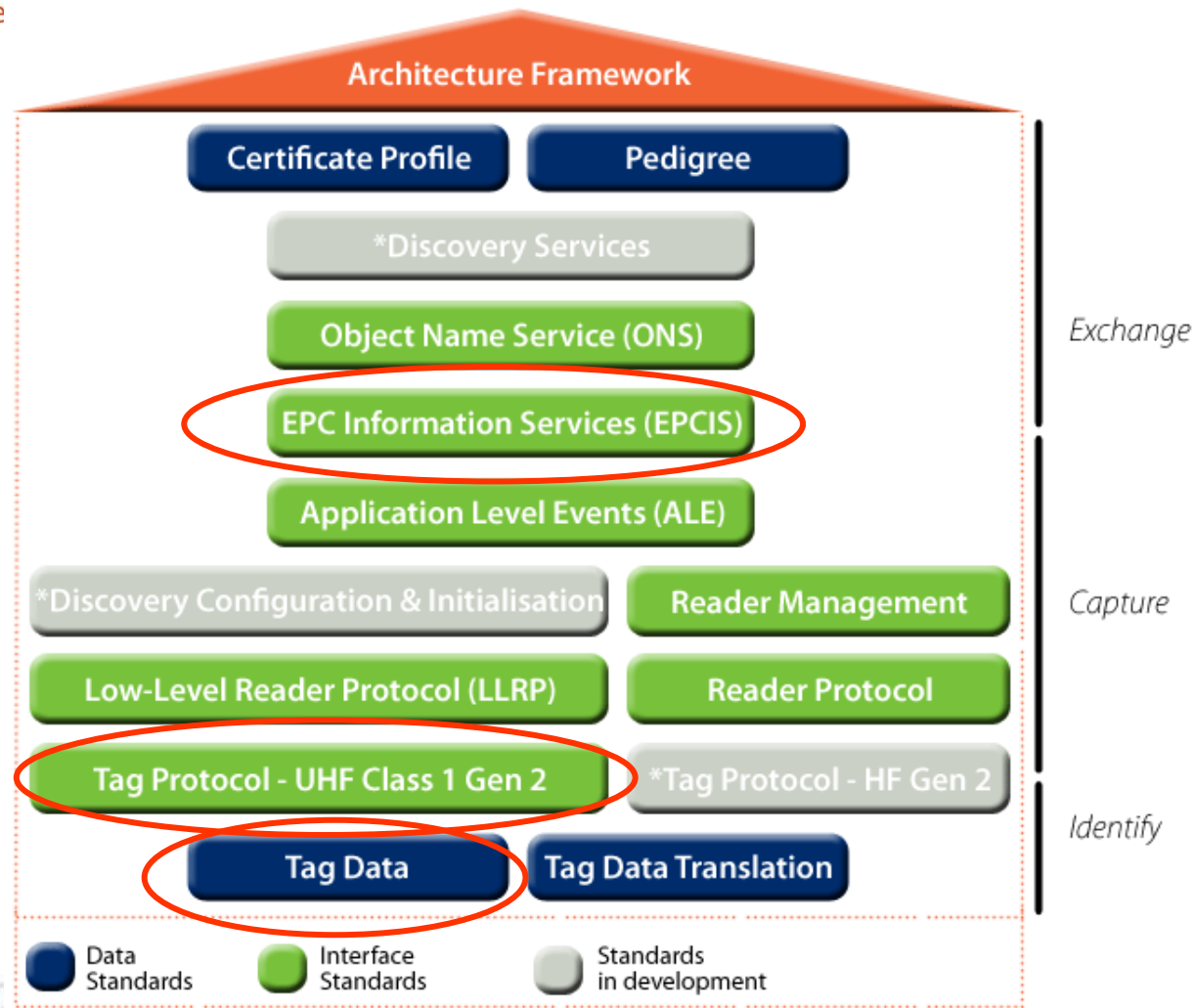
GS1 in Numbers

GS1 is a not-for-profit organisation that develops global standards for the identification of goods and services.

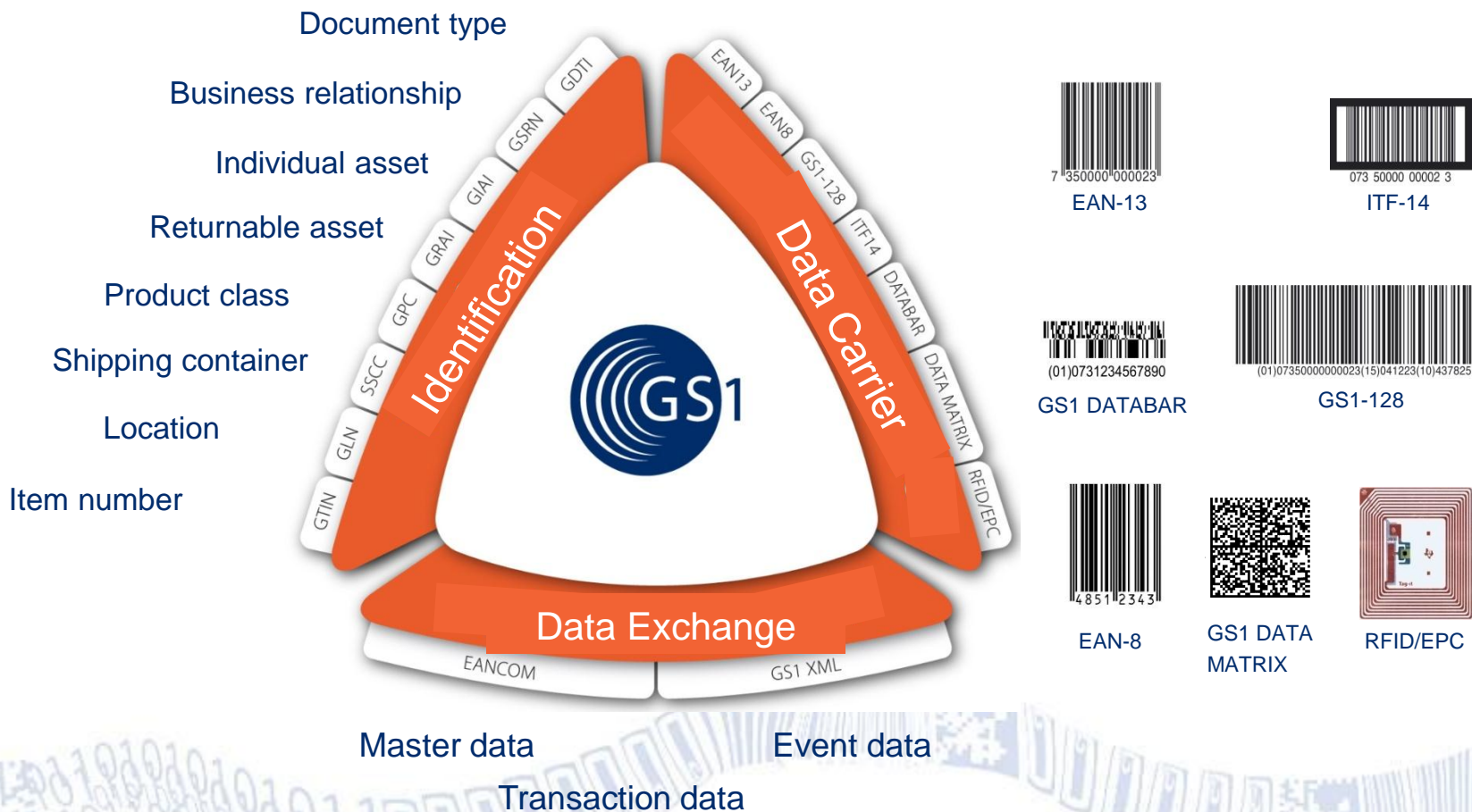
- Over **30** years of experience
- **108** member organisations representing **all points** in the supply chain
- Over a **million** companies doing business across **145** countries
- Over **20** represented sectors (FMCG, healthcare, transport, defence...)
- Over **5 billion** transactions a day

GS1 is the most widely used
supply chain standards system in the world

EPCglobal Architecture Framework



The GS1 System



Type of RFID

Air interface
ISO18000-6 type C





18000-6C

Passive tags

UHF Class 1 Gen 2

860-960 MHz



Wagon identification

Global Individual
Asset Identifier (GIAI)





Wagon identification

Transponder/tag

User memory
TID
EPC-Code: GIAI 96
Reserved





GIAI- 96 encoding EVN / UIC

European Vehicle Number (EVN)

- Wagons are increasingly used in different countries thus crossing borders
- To enable identification all vehicles within the EU will be given a 12 digit id **European Vehicle Number (EVN)**.
- Goods wagons that already have an international UIC number will be able to keep the number
- The number should be shown clearly on the wagon
- GS1 Solution : GIAI-96 as follows





Global Individual Asset Identifier

Company Prefix

735999271

Entity responsible for maintaining the individual asset reference (wagon owner).

- global uniqueness ensuring that the identification number does not collide with any other numbers
- wagon identifier makes sense even outside the “National Vehicle Register” NVN

Individual Asset Reference

1917400000019

- first digit is a side/end indicator (“1” or “2”)
- 12 digits are the European Vehicle Number / UIC (for goods wagon)



Sharing Data

EPCIS





EPC Information Services (EPCIS)

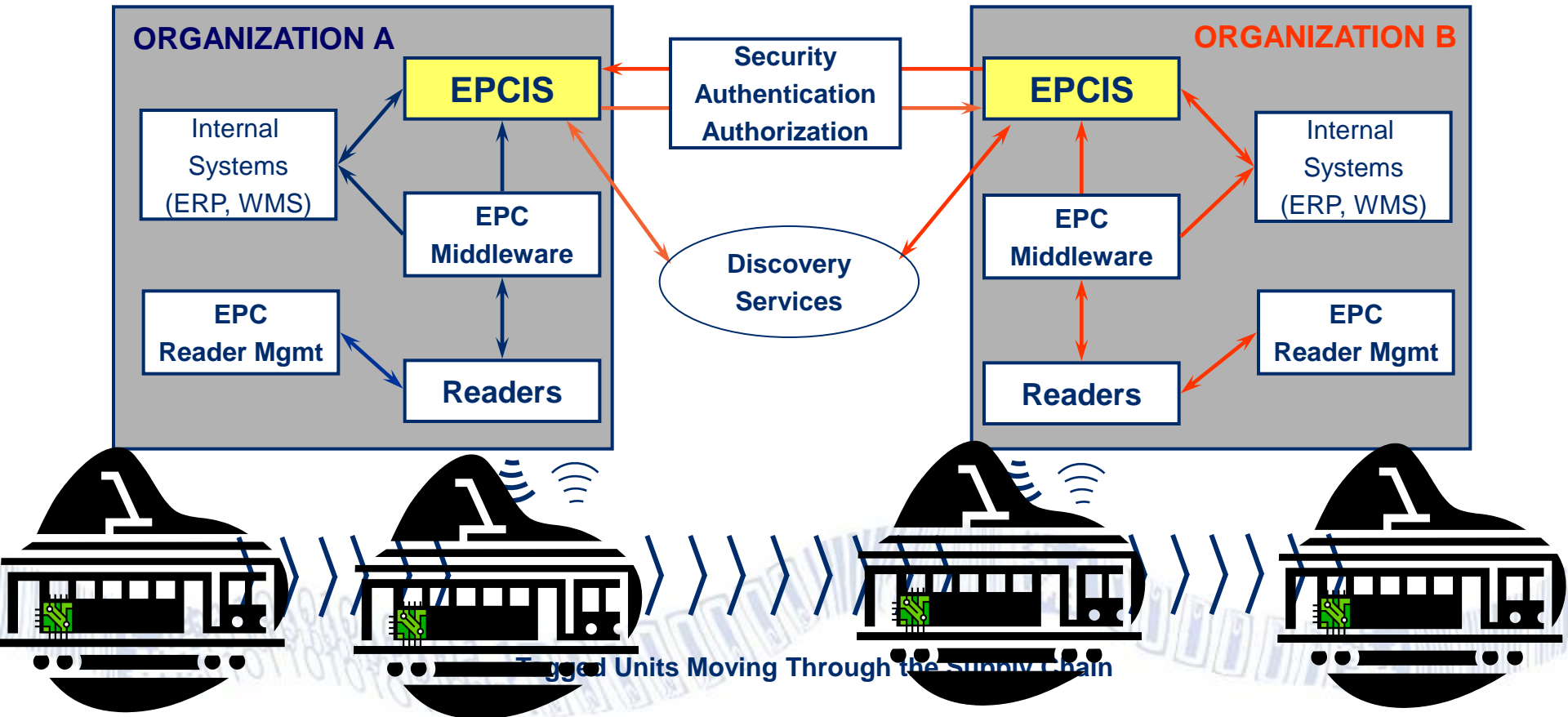
The EPCIS (Electronic Product Code Information Services) Standard was developed to define *interfaces that enable sharing of data between trading partners.* EPCglobal ratified standard - March, 2007

- EPCIS is standard-based approach to securely share information that will provide visibility and improve businesses processes
- Each company keeps its own data, and chooses when and with whom to share.
- EPCIS is a point-to-point standard - You have to know where the other EPCIS servers are



Visibility

Supply Chain Visibility *Event Related Information*



Tagged Units Moving Through the Supply Chain

EPCIS



What	GS1 identification number e.g. GIAI, GRAI •e.g identifying, wagon, container, trailer etc.
Where	GS1 location id – SGLN •e.g identifying yard, track, station etc
When	Record time, event time •e.g 23.09.201008:46:00 UTC+9
Why	Business step e.g. departing, passing, arriving



Structure – RFID

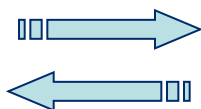


GS1 - Standard

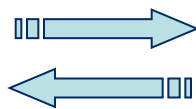
EPC
Tagg



ISO18000-6 C



Reader



EPCIS



Company

Internal
Information
system



Interoperability and Interconnectivity



Göteborg

Falköping

Harbour
Information
System

Man X

Man A

Man C

Trafikverket
Information
Systems

Man B

Man D

Man Y

Terminal
Information
System

EPCIS Information

What
Where
When
Why



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The global language of business