CEN/TC 278 PT1605

Webinar #1

Session #4

Generic access to sensors and control data for C-ITS services in accordance with TS 21184

Introduction

(14:30 – 15:15)

Gangolf Feiter

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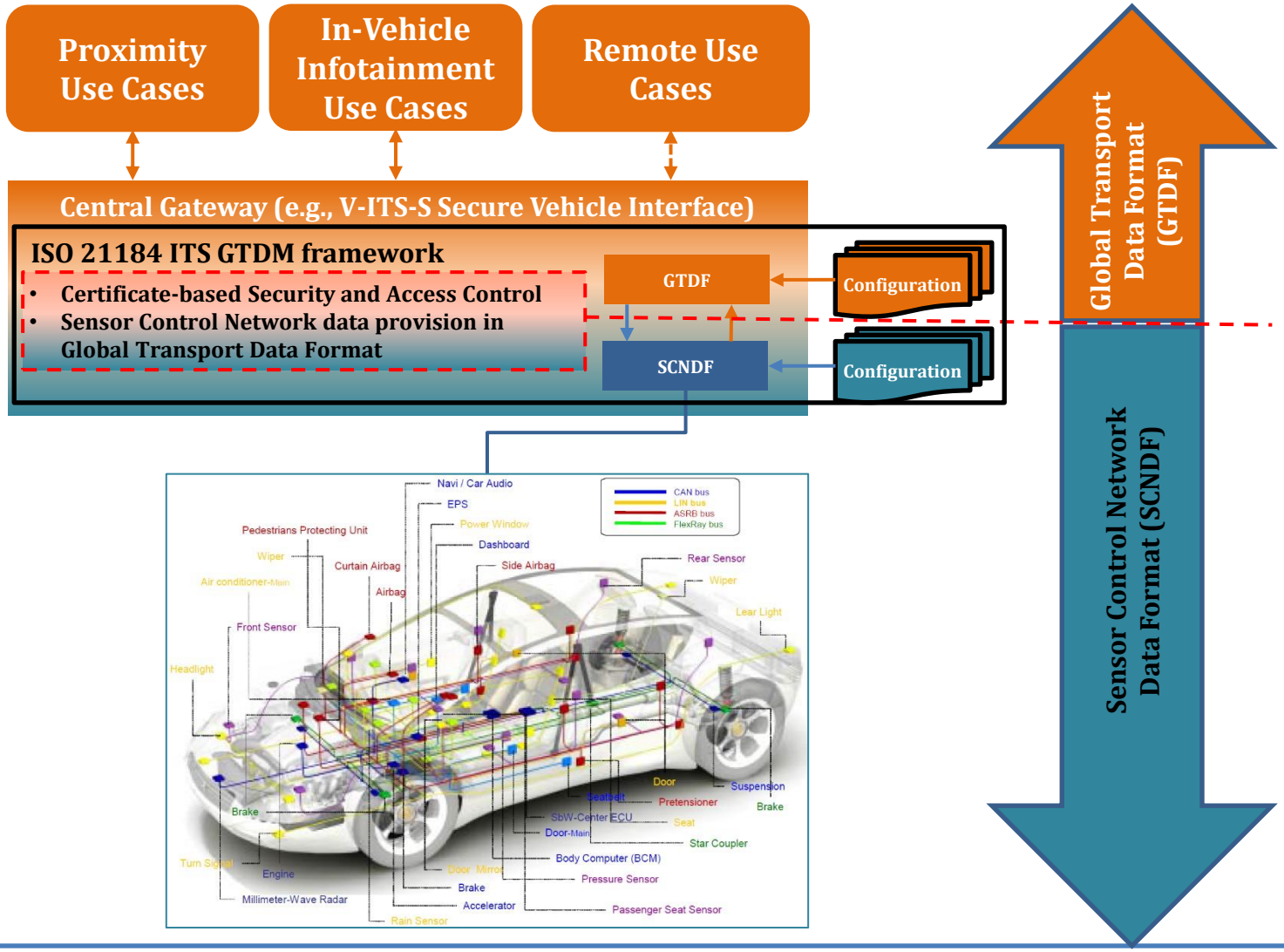
Overview

- Scope
- CEN ISO TS 21184 Use Case Groups
- What Problem does CEN ISO TS 21184 GTDM solve?
- Configuration and Certificate Distribution Process
- Certificate PSID and SSP – Access Control
- CEN ISO TS 21184 DTDM framework – TOC

Scope

- This document specifies a global transport data management (GTDM) framework composed of
  - global transport basic data model,
  - global transport function monitor data model, and
  - global transport access control data model
- to support data exchange between applications and correct interpretation of data.
- This document defines standardized data classes in a Global Transport Data Format (GTDF), and means to manage them.
- Data exchange between ITS stations is based on messages and content composed of pre-configured information including conditional handling. Each message uses a global unique identifier and the associated data element. The format of the data element is specified by the global unique identifier pointing to configuration information including instructions for correct interpretation of the data element.
- Application and role-based access control to GTDF resources are specified in conformance with IEEE 1609.2 certificates.
- This document specifies GTDM as an ITS-S capability conformant with ISO 24102-6, which is an optional feature.

CEN ISO TS 21184 Use Case Groups



CEN ISO TS 21184 Use Cases

Proximity Use Cases

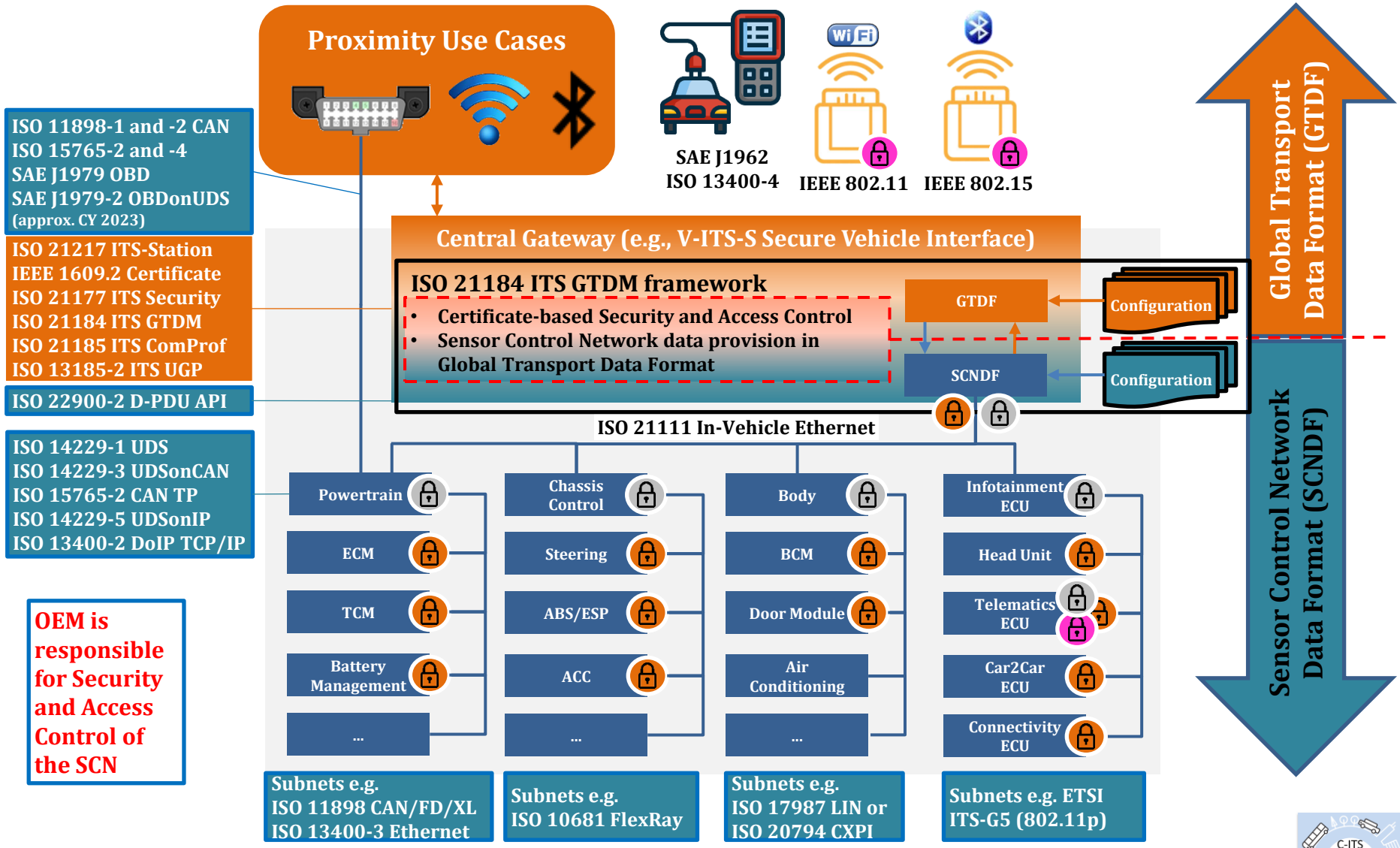
In-Vehicle Infotainment Use Cases

Remote Use Cases

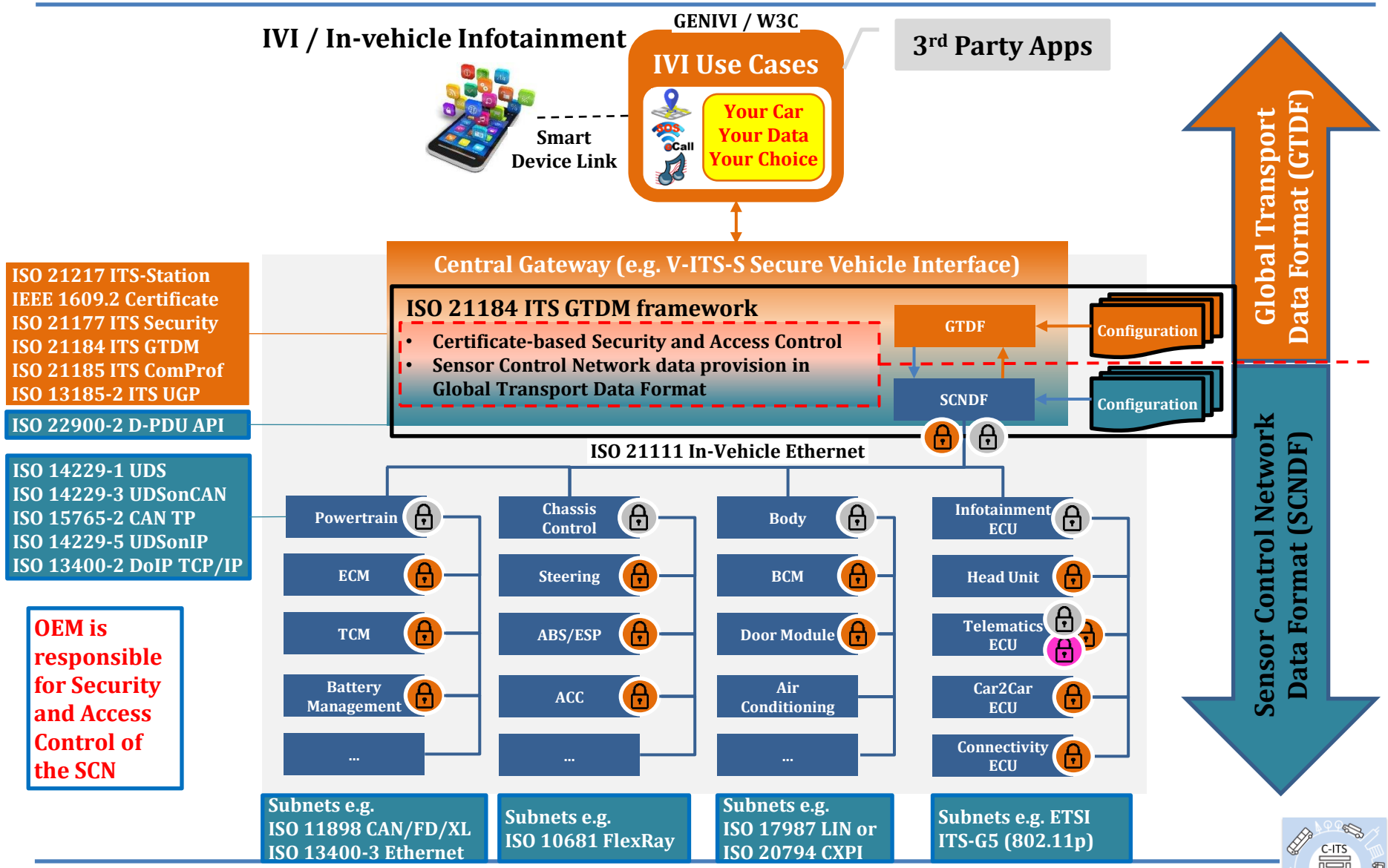
- Proximity Use Cases, e.g.
  - Diagnostic, Repair and Maintenance
  - Electronic Periodic Technical Inspection (ePTI)
  - Roadside Assistance at the vehicle
- In-vehicle Infotainment Use Cases , e.g.
  - Vehicle Health Status
  - P-A-Y-D (Pay-As-You-Drive) data collection
  - Insurance data collection
  - Any 3rd Party App data access
- Remote Use Cases , e.g.
  - Remote Diagnostic Services (TC22: ISO 20080 RDS)
  - Extended Vehicle (TC22: ISO 20077, 20078 ExVe)
  - Cooperative ITS Services (TC204: ISO 21177, localized and networked communications)

Not a complete list!

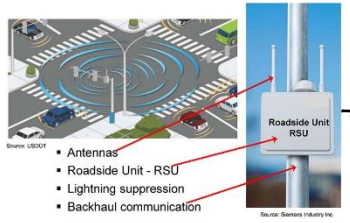
CEN ISO TS 21184 Use Cases Illustration (1 of 3)



CEN ISO TS 21184 Use Cases Illustration (2 of 3)



CEN ISO TS 21184 Use Cases Illustration (3 of 3)



SAE J2735
e.g. BSM

ISO 17429
generic messages

Remote Use Cases

DSRC 4G 5G

Internet Standards

ISO 20078 ExVe
ISO 20080 RDS

OEM Server and / or Neutral Server

Global Transport Data Format (GTDF)

Sensor Control Network Data Format (SCNDF)

Central Gateway (e.g. V-ITS-S Secure Vehicle Interface)

ISO 21184 ITS GTDM framework

- Certificate-based Security and Access Control
- Sensor Control Network data provision in Global Transport Data Format

GTDF — Configuration

SCNDF — Configuration

ISO 21217 ITS-Station
IEEE 1609.2 Certificate
ISO 21177 ITS Security
ISO 21184 ITS GTDM
ISO 21185 ITS ComProf
ISO 13185-2 ITS UGP

ISO 22900-2 D-PDU API

ISO 14229-1 UDS
ISO 14229-3 UDSonCAN
ISO 15765-2 CAN TP
ISO 14229-5 UDSonIP
ISO 13400-2 DoIP TCP/IP

ISO 21111 In-Vehicle Ethernet

Powertrain	Chassis Control	Body	Infotainment ECU
ECM	Steering	BCM	Head Unit
TCM	ABS/ESP	Door Module	Telematics ECU
Battery Management	ACC	Air Conditioning	Car2Car ECU
...	...	...	Connectivity ECU

OEM is responsible for Security and Access Control of the SCN

Subnets e.g.
ISO 11898 CAN/FD/XL
ISO 13400-3 Ethernet

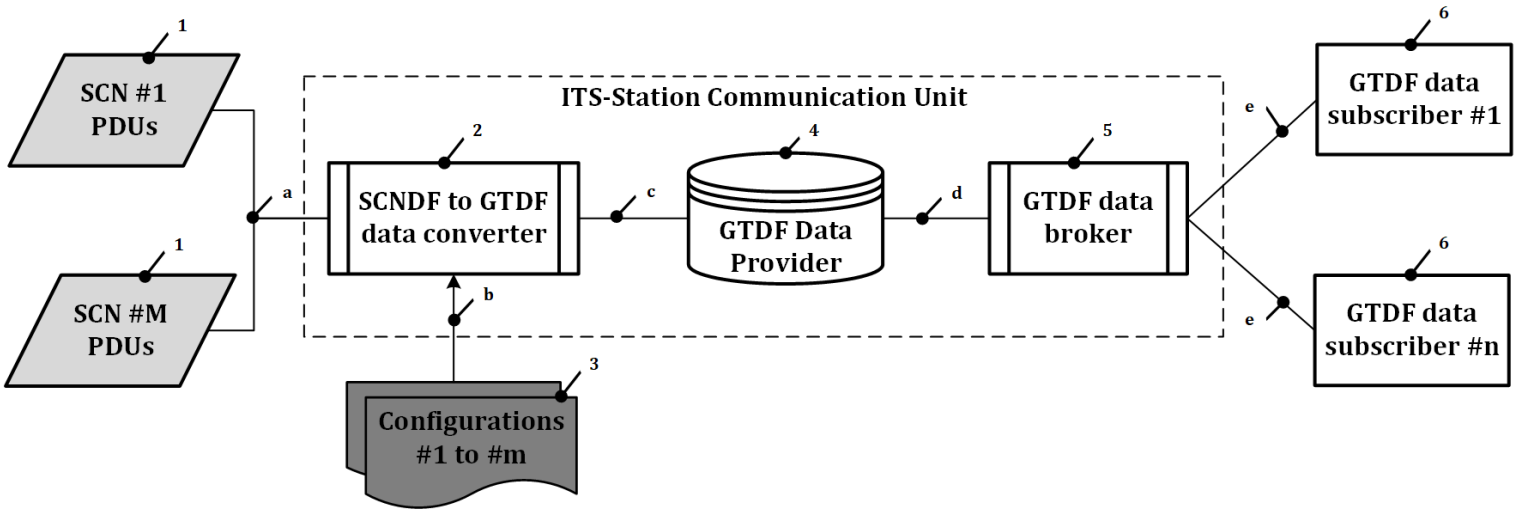
Subnets e.g.
ISO 10681 FlexRay

Subnets e.g.
ISO 17987 LIN or
ISO 20794 CXPI

Subnets e.g. ETSI
ITS-G5 (802.11p)

What Problem does CEN ISO TS 21184 GTDM solve?

- The purpose of ISO TS 21184 C-ITS – Global Transport Data Management (GTDM) framework standard is to provide a **2-way data conversion concept** between sensor and control networks (SCNs) of e.g., roadside units, vehicles and ITS, diagnostic, ... applications. TS 21184 GTDM specifies differentiated and secure access to data based on certificates with role information and complies with GDPR (General Data Protection Regulation). It integrates with the communication security mechanisms specified in TS 21177.
- TS 21184 GTDM specifies the data models for SCN protocols and its proprietary data formats (SCNDF), conversion information into the Global Transport Data Format (GTDF) based on standardized data types.
- The major benefit is a “one time data translation” to satisfy all ITS, In-vehicle Infotainment, and Diagnostic use cases.



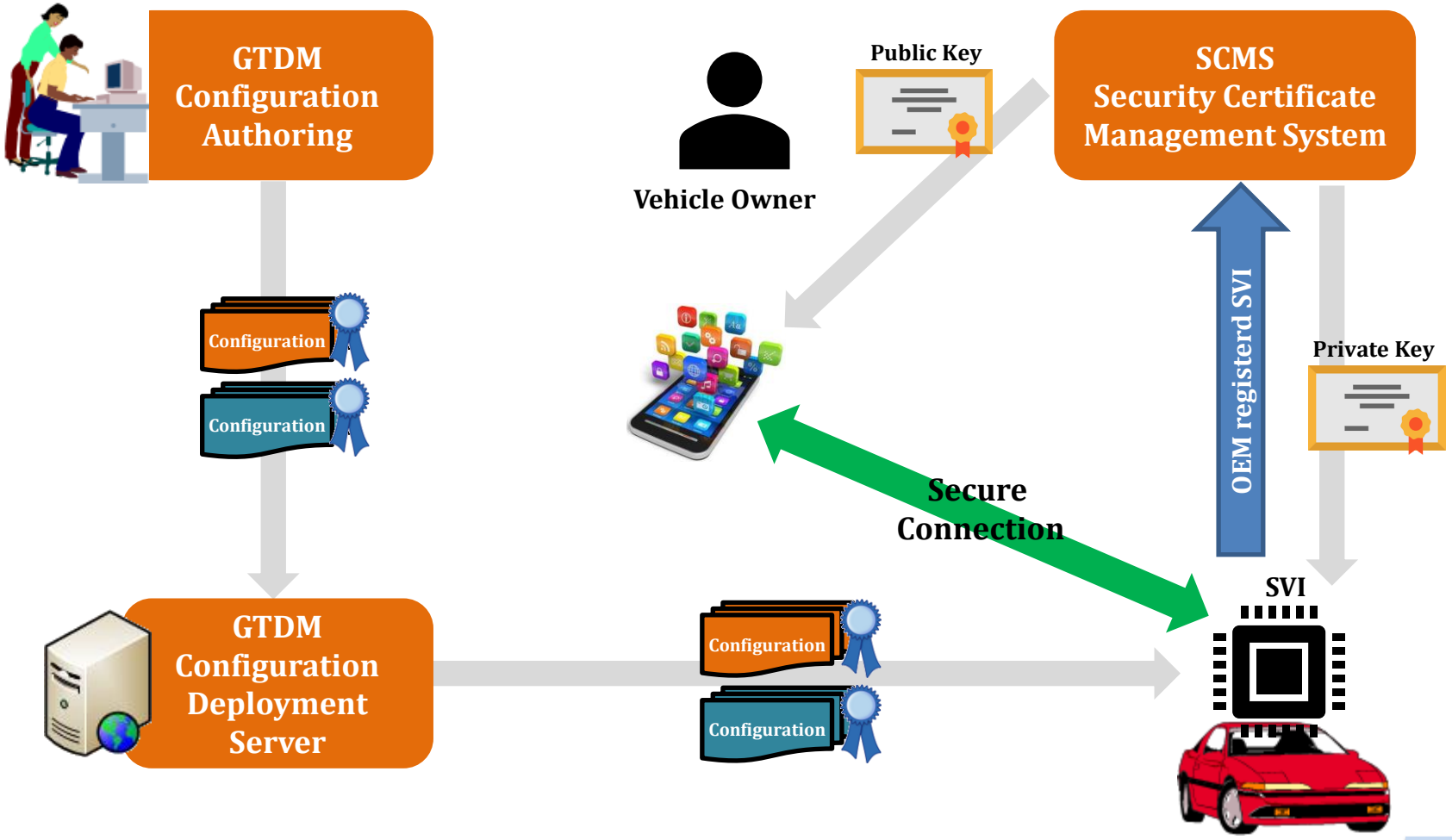
What Problem does CEN ISO TS 21184 GTDM solve?

- Legend of Figure 4 — Data flow from SCN data format to global transport data format

1	sensor and control network #1 to #m protocol data units
a	Sensor and control network protocol data units, containing raw signals in raw data format, forwarded to the GTDF data converter.
2	sensor and control network data format (raw data) to global transport data format converter
3	configuration data specific to SCN containing standardized data conversion information for formulas, data parameter refresh schedule, and access control permission information as input to key 2
b	Sensor and control network specific configuration data to convert raw PDUs into global transport data format in key 2.
c	Converted data parameters into global transport data format forwarded to the GTDF Data Provider.
4	GTDF Data Provider contains all data parameters/data bundles/data records specified in the configuration(s).
d	GTDF Data Provider provides data parameters to the GTDF data briker for publishing to subscriber(s).
5	The GTDF broker performs event-based transfer of instant updates or historically measured data according to subscription(s).
e	The GTDF data broker publishes on event (update) data parameters based on subscription by clients.
6	Clients subscribe to data parameters based on the implementation of use cases.

Configuration and Certificate Distribution Process

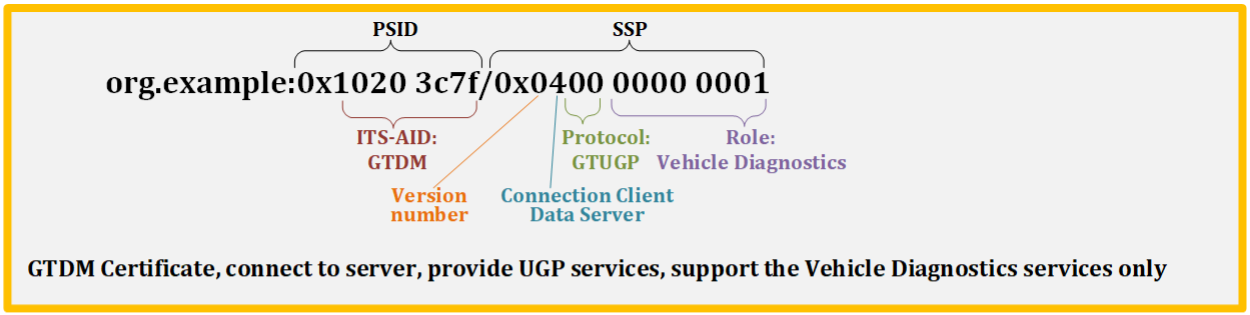
- OEM SVI Configuration and Certificate Distribution Process – Deployment



Certificate PSID and SSP – Access Control

- PSID: Provider Service Identifier
- SSP: Service Specific Permission

V-ITS-S Certificate



GTBasic Config	What data is defined? (ECUs, data parameters, DTCs, ...)
GTAC Config	Which role has what kind of access to data and control functions?
GTFM Config	Which function monitors are initiated?
SCNDF Config	How to access and convert sensor data into Global Transport Data Format?

CEN ISO TS 21184 DTDM framework – TOC

Agenda webinar #1

- **Session 1**: 13:10 – 13:25
- C-ITS standardization landscape (TR 21186-1)
- **Session 2**: 13:25 – 14:00

  Hybrid communications for C-ITS service deployment (TR 21186-2, TS 17496)
- **Session 3**: 14:00 – 14:15

  Generic position, velocity and time information for C-ITS services (TS 21176)
- **Break**: 14:15 – 14:30
- **Session 4**: 14:30 – 15:15

  Generic access to sensor and control data for C-ITS services (TS 21184)
- **Session 5**: 15:15 – 16:00

  Cybersecurity for C-ITS services (TS 21177, TR 21186-3)
- Questions and discussions: 16:00 – 17:00

Subsequent webinars will present in more detail these technologies.

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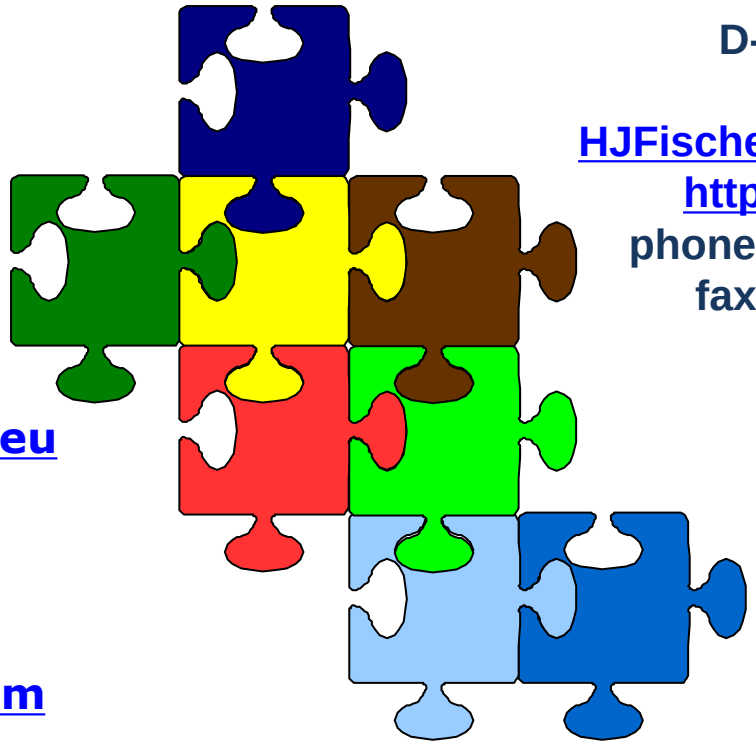

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