

C-ITS / connected vehicle deployment Webinar

CEN/TC 278 PT1605

**Day 2+ standards - Secure access to sensor and
control networks**

CEN ISO 21184 C-ITS - GTDM framework

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- This session gives an overview about
 - CEN ISO TS 21184 Global Transport Data Management (GTDM) framework

- Topics of this session:
 1. Supported Use Case Groups
 2. Certificate-based Secured Access to Sensor and Control Networks
 3. Functionality and Flexibility through Configuration Files
 4. On-Demand Installation via OTA (Over The Air) e.g. depending on GNSS location

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

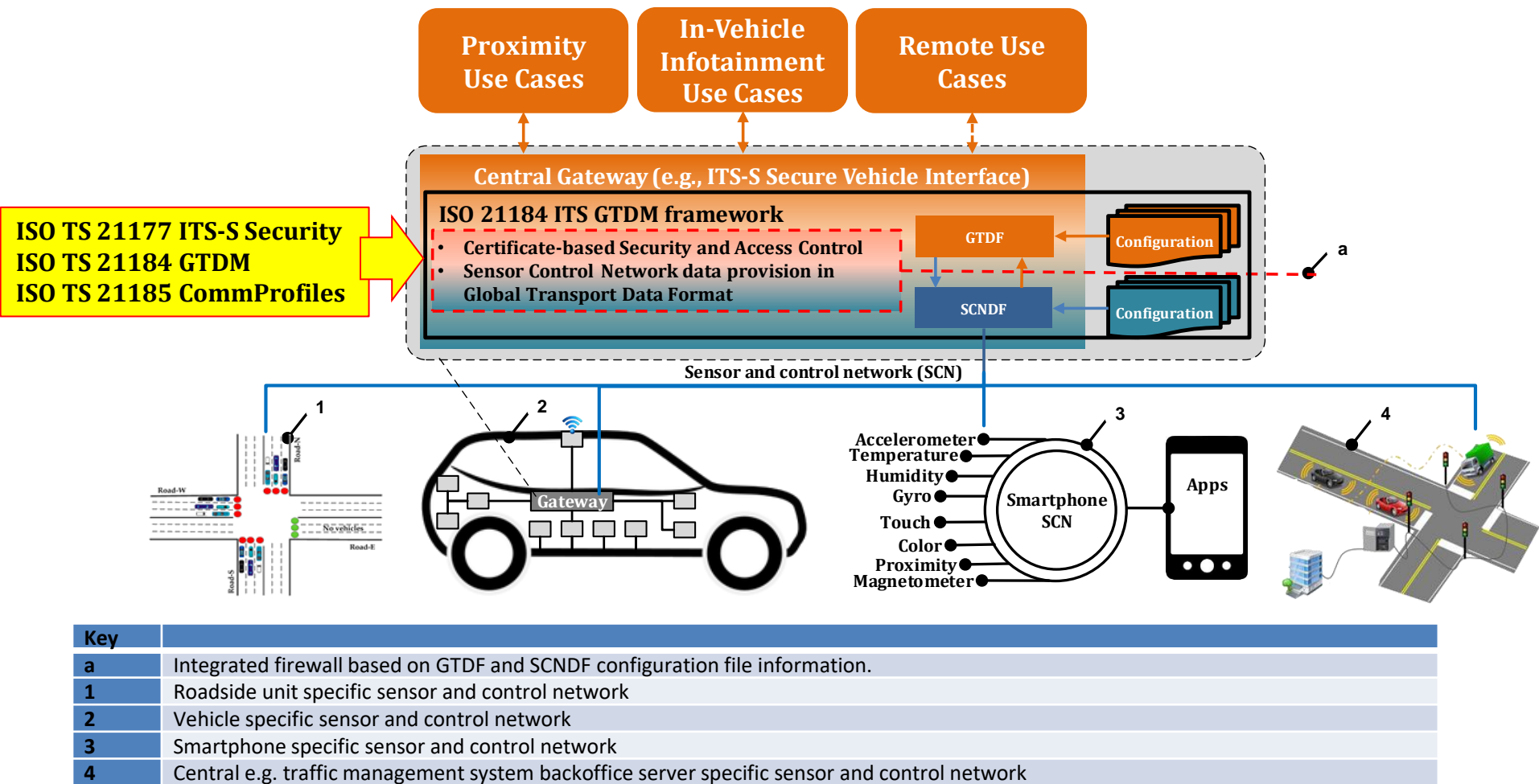


Figure 3 — Application use cases and sensor and control networks

- At startup the GTDM framework software loads the GTDF and SCNDF configurations. Based on the content of the configurations the software starts the communication with the SCN(s) and accesses raw information as specified in the SCNDF configurations. Once the protocol data units (PDUs) are available the relevant raw information is masked out of the PDU and converted into the global transport data format (GTDF). **Each data item is assigned an electronic control unit (ECU) identifier and a data parameter identifier.** The combination of both identifiers make it a unique identifier for a newly created or updated data item in the GTDM framework. The timing of accessing raw data on the SCN(s) is defined in the scheduler as part of the SCNDF configuration. Various access methods e.g. on event, periodic, request and response scheme are available how to access the raw data on the SCN(s).
- **All data items in GTDF are time stamped at the time of measurement** and available by the Data Provider which also supports a **data broker function.** The global transport protocol (GTP) services specified in this document are used to access and control data items. **The GTP services provide a superset of functionality of the most common protocols e.g., ISO 13185-2 UGP, ISO/IEC 19464 AMQP, MQTT, ProtBuf, W3C VIS used in the industry. A data format converter needs to be installed for each protocol to interface with the GTP services.** The access control specified in this document is dedicated to the GTP services and individual data parameter level depending on the content of the IEEE 1609.2 compatible certificates.

Figure 4 illustrates secure nearby access to e.g. the vehicle's sensor and control network (SCN) via an e.g. central gateway with a V-ITS-S SVI software implementation. Proximity use cases define the nearby access to data and control functions supported by the SCN(s) of the e.g. vehicle.

Proximity Use Cases, e.g.

- Diagnostic, Repair and Maintenance
- Electronic Periodic Technical Inspection (ePTI)
- Roadside Assistance at the vehicle

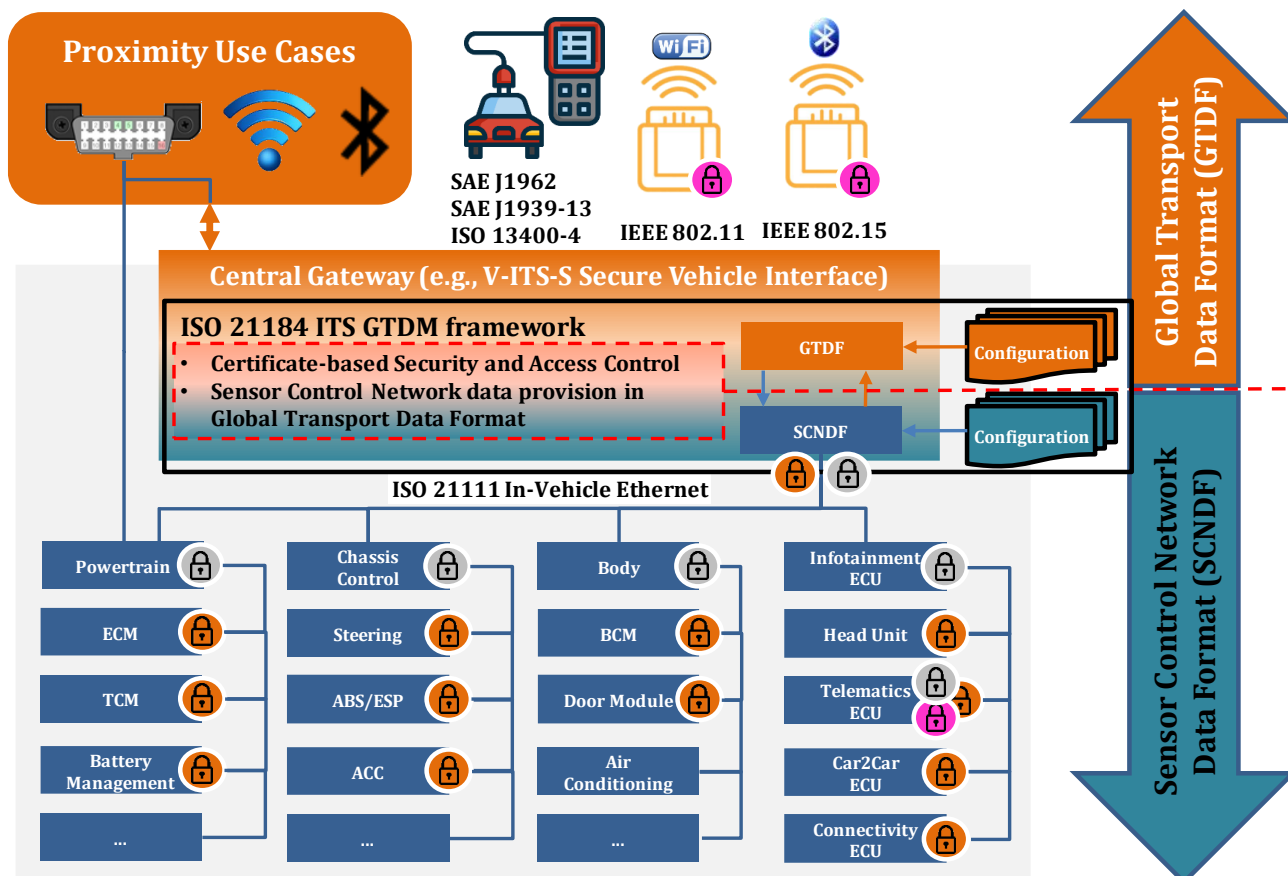


Figure 4 — Proximity use cases

Figure 5 illustrates secure IVI on-board access to e.g. the vehicle's sensor and control network (SCN) via an e.g. central gateway with a V-ITS-S SVI software implementation. IVI use cases define the vehicle's on-board access to data and control functions supported by the SCN(s) of the e.g. vehicle.

IVI 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

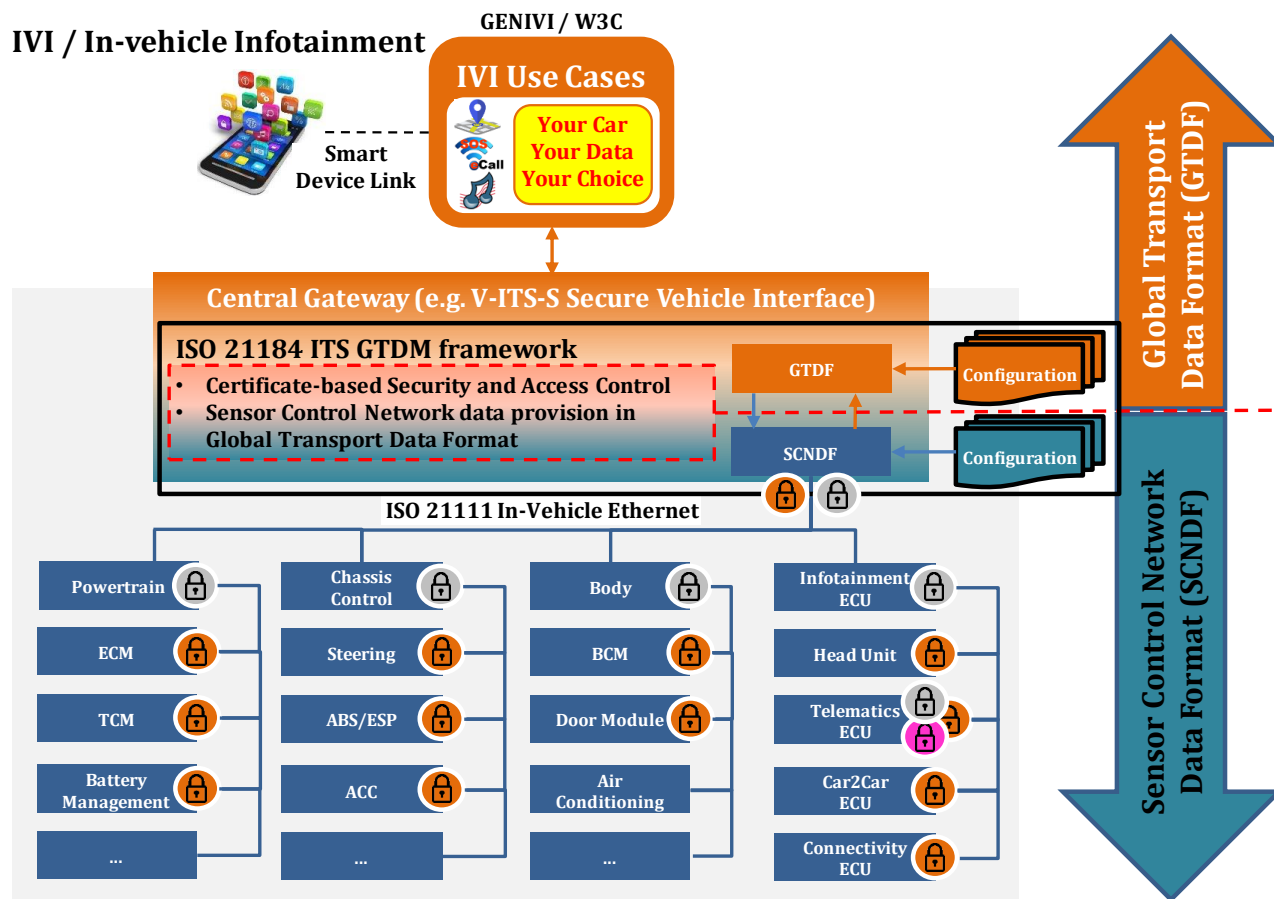
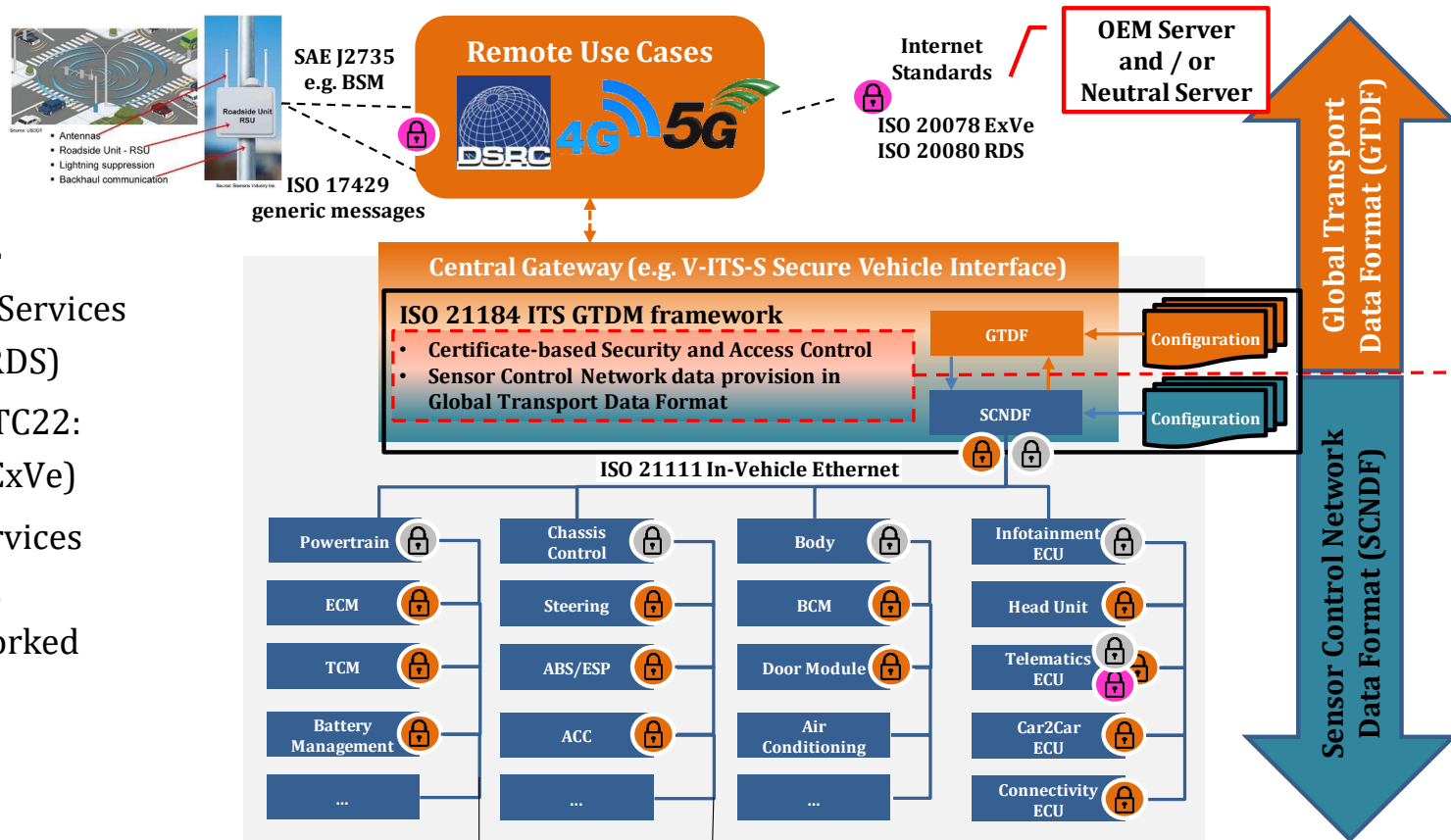


Figure 5 — In-vehicle Infotainment use cases

Figure 6 illustrates secure remote access to e.g. the vehicle's sensor and control network (SCN) via an e.g. central gateway with a V-ITS-S SVI software implementation. Remote use cases define the vehicle's remote access to data and control functions supported by the SCN(s) of the e.g. vehicle.



Remote Use Cases , e.g.

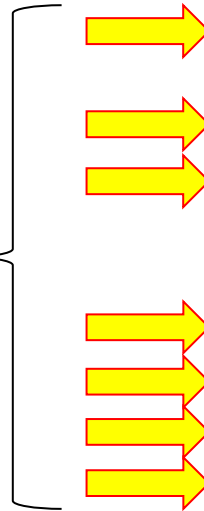
- Remote Diagnostic Services (TC22: ISO 20080 RDS)
- Extended Vehicle (TC22: ISO 20077, 20078 ExVe)
- Cooperative ITS Services (TC204: ISO 21177, localized and networked communications)

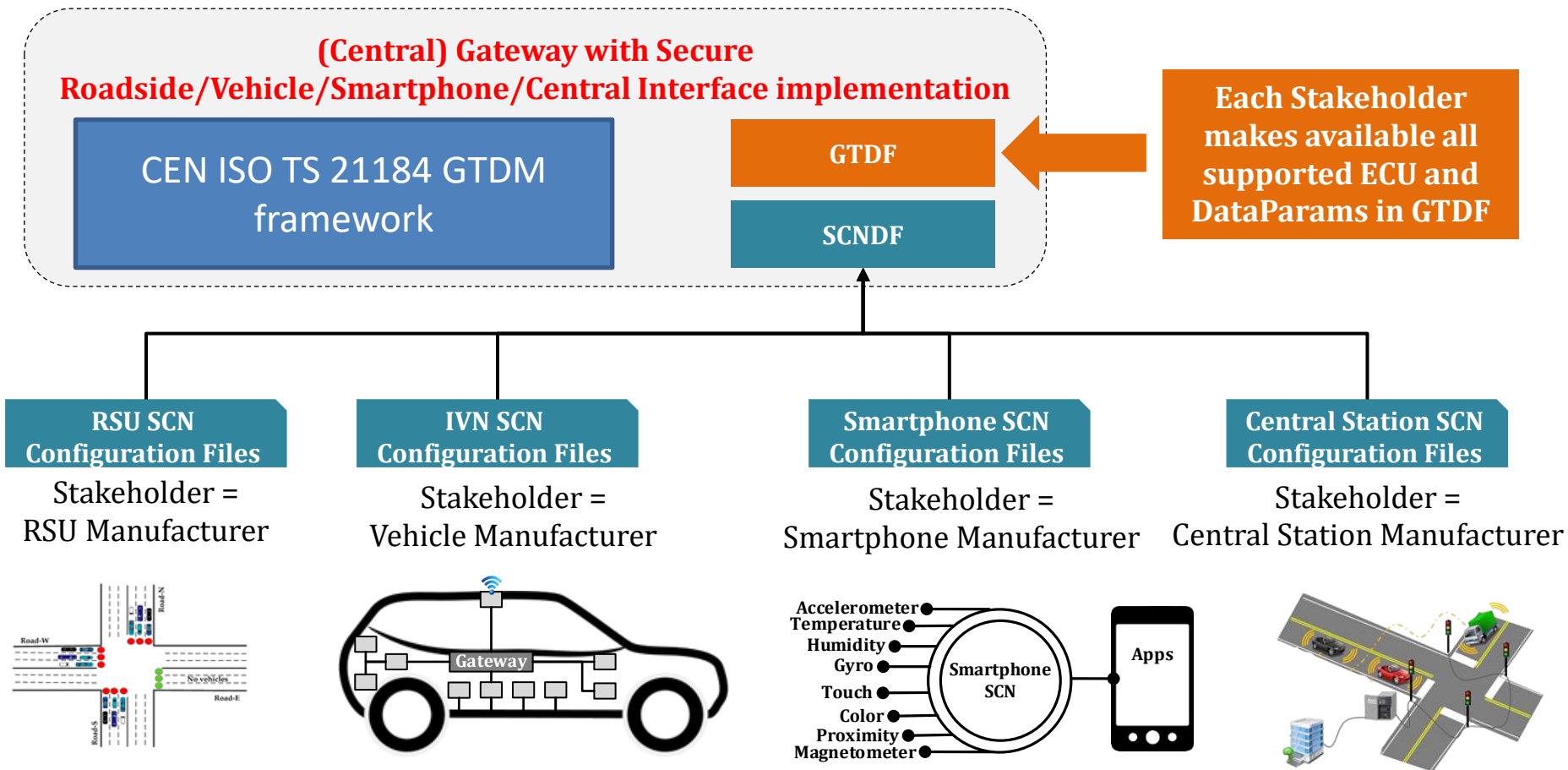
Figure 6 — Remote use cases

Table 81 — Overview of GTP messages

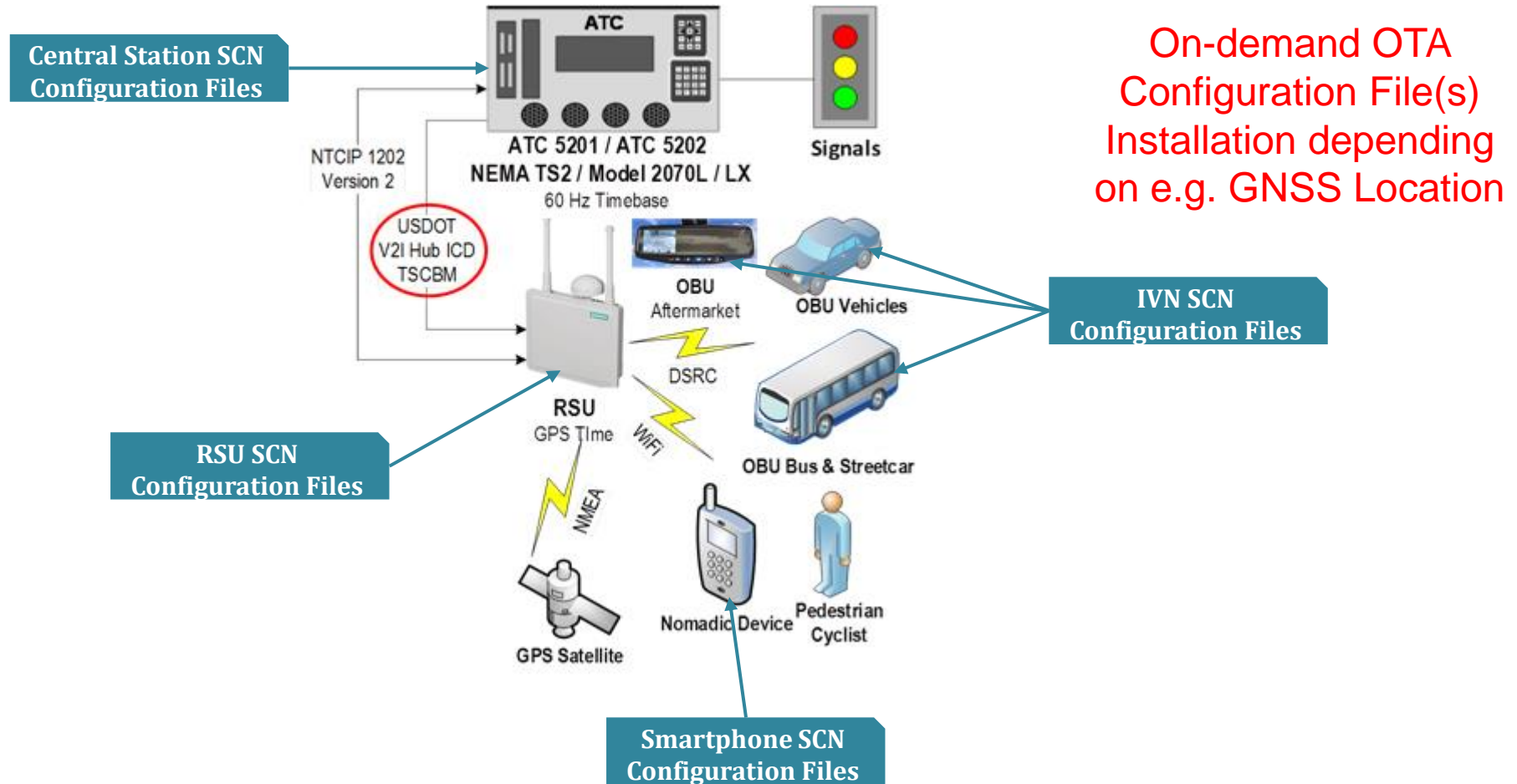
REQ	F.13 ITS-S Facilities - GTPMessage	
The GTP Handler (F3) shall provide the GTPMessage according to the ASN.1 definition specified in A.6. The GTPMessage shall provide the following services.		
Service choice	Primitive	Description
GetStationUnits	Call, Reply	get the identifiers list of all current station units
GetEcuDataParams	Call, Reply	retrieve the supported ECUDataParams of a given station unit
SubscribeValues	Call	subscribe to ECU data parameter value changes
PublishValues	Reply	publish ECU data parameter value changes
SetValues	Call	set ECU data parameter values local or in the SCN
ControlValues	Call, Reply	control elements in the SCN
SubscribeMessages ^a	Call	subscribe to GTMessages
PublishMessages ^a	Reply	publish GTMessages
SubscribeDtcInfo	Call	subscribe to DTC info
PublishDtcInfo	Reply	publish DTC info
ClearDtcInfo	Call	clear DTC info
EnablePassThru	Call	enable pass thru
ListFiles	Call, Reply	list files
ManageFiles	Call, Reply	download, upload and delete files
Reset	Call	reset the ITS-SU
PositiveReply	Reply	reply positive to a service without own Reply primitive
NegativeReply	Reply	reply negative to any service
^a SubscribeMessages and PublishMessages shall be supported as client and server		

New services





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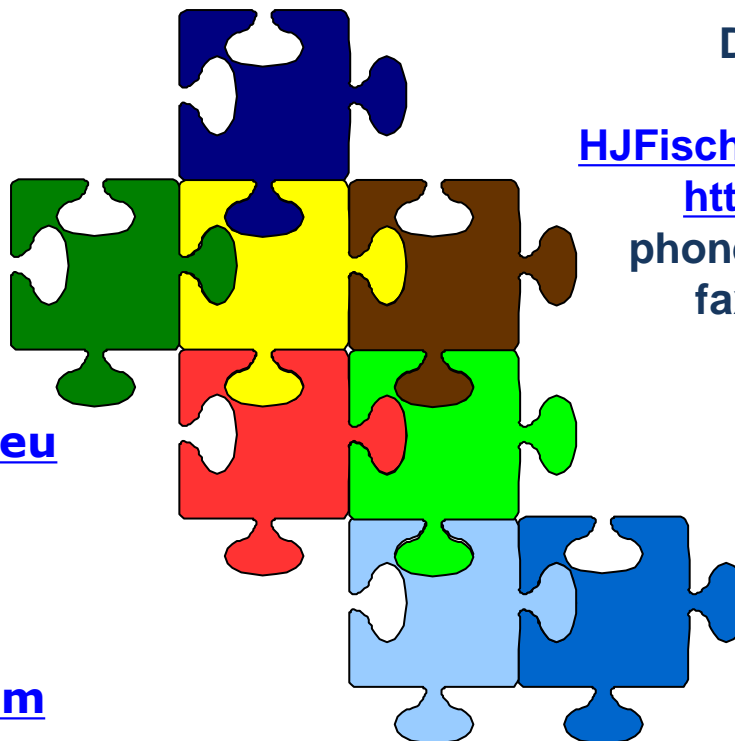
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