

Connected Vehicle Ecosystem & ISO 21434

1. Abbreviations
2. Reference Standard
3. General Connected Vehicle Architecture Example
4. The Component of Connected Vehicle

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1. Abbreviations

ADAS	Advanced Driver Assistance Systems
CAN	Controller Area Network
CCMS	Cooperative-ITS Security Certificate Management System
ECU	Electronic Control Unit
ETH	IEEE Standard 802.3bw for Ethernet
GNSS	Global Navigation Satellite System
ITS	Intelligent Transport Systems
IVI	In-Vehicle Infotainment
OBDII	The Second On-Board Diagnostics
OTA	Over-the-AirTechnology Software Update
PKI	Public Key Infrastructure
RTOS	Real-Time Operating System
TBOX	Telematics BOX
V2X	Vehicle-to-Everything
V2X OBD	V2X On-Board Device
V2X RSU	V2X Road Side Unit

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1. Reference Standard (Audience must understand basic standard before do ISO 21434 & Connected Vehicle)

ISO 26262: Road vehicles — Functional safety

SAE J3061: Cybersecurity Guidebook For Cyber-Physical Vehicle Systems(It will be superseded by ISO 21434)

ISO 21434: Road vehicles — Cybersecurity engineering

AUTOSAR: AUTomotive Open System ARchitecture, The standardization of a common methodology, basic system functions and functional interfaces

EU CCMS: Certificate Policy for Deployment and Operation of European Cooperative Intelligent Transport Systems 2018

ETSI TR 102 638: Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Definitions

ETSI TS 102 940: Intelligent Transport Systems (ITS);

Security; ITS communications security architecture and security management

ETSI TS 102 941: Intelligent Transport Systems (ITS); Security; Trust and Privacy Management.

ETSI TS 102 943: Intelligent Transport Systems (ITS); Security; Confidentiality services.

ETSI TS 103 097: Intelligent Transport Systems (ITS); Security; Security header and certificate formats

ETSI EN 302 665: Intelligent Transport Systems (ITS); Communications Architecture

3GPP TS 22.185: Service requirements for V2X services

3GPP TS 33.102: 3G Security architecture

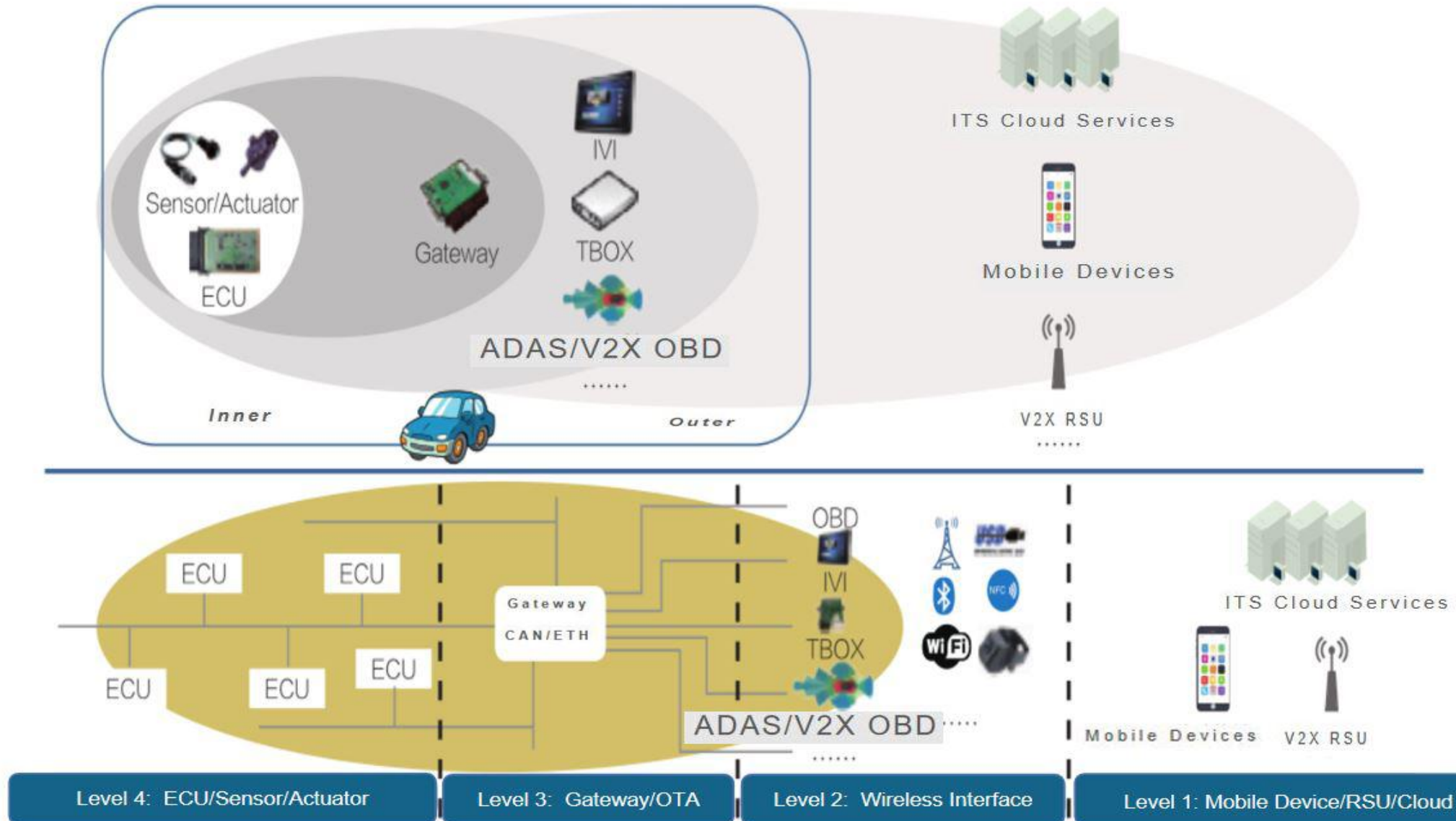
3GPP TS 33.401: 3GPP System Architecture Evolution (SAE); Security architecture

3GPP TS 33.501: Security architecture and procedures for 5G system

5GAA: 5GAA Efficient Security Provisioning System 2019

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3. General Connected Vehicle Architecture Example



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4. The Component of Connected Vehicle (ECU+Gateway+IVI+ADAS+V2X OBD+GNSS+USB+Wireless)

4.1 The primary component of ECU+Gateway

- RTOS such as FreeRTOS
- CAN protocol stack
- OBDII protocol stack
- Ethernet + IP protocol stack
- AUTOSAR
- PKI Policy Deployment
- Supply chain security and risk policy

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4. The Component of Connected Vehicle (ECU+Gateway+IVI+ADAS+V2X OBD+GNSS+USB+Wireless)

4.2 The primary component of IVI+Dashboard+TBOX+V2X OBD

- Android or Linux+GENIVI or Virtual Machine
- CAN protocol stack
- OBDII protocol stack
- Ethernet + IP protocol stack
- AUTOSAR
- NFC/Bluetooth/Wifi/5G protocol stack
- V2X protocol stack
- USB protocol stack
- ITS related protocol stack and application
- GNSS application
- Internet service access
- PKI Policy Deployment such as CCMS
- Supply chain security and risk policy

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4. The Component of Connected Vehicle (ECU+Gateway+IVI+ADAS+V2X OBD+GNSS+USB+Wireless)

4.3 The primary component of ADAS+V2X OBD

- RTOS such as FreeRTOS or Linux+Virtual Machine
- Baidu Apollo Autonomous Driving Platform
- CAN protocol stack
- OBDII protocol stack
- Ethernet + IP protocol stack
- AUTOSAR
- NFC/Bluetooth/Wifi/5G protocol stack
- V2X protocol stack
- USB protocol stack
- ITS related protocol stack and application
- GNSS application
- Internet service access
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4. The Component of Connected Vehicle (External Services)

4.4 The primary component of Mobile Device

- Android Application
- iOS Application
- Android Auto
- Carplay of Apple
- Carlife of Baidu
- GNSS service
- Kinds of interactive mobile application with Connected Vehicle
- PKI Policy Deployment
- V2X related protocol stack and application(in future)

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4. The Component of Connected Vehicle (External Services)

4.5 The primary component of V2X RSU

- RTOS such as FreeRTOS or Linux+Virtual Machine
- Ethernet + IP protocol stack
- Bluetooth/Wifi/5G protocol stack
- V2X related protocol stack and service
- ITS related protocol stack and service
- GNSS service
- Internet service access
- PKI Policy Deployment such as CCMS.

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4. The Component of Connected Vehicle (External Services)

4.6 The primary component of ITS Cloud Services

- Cluster system such as use Linux+KVM+Docker+Openstack+MySQL+Web Service
- ITS related protocol stack and service
- V2X related protocol stack and service
- Kinds of interactive services with Connected Vehicle.
- PKI Policy Deployment such as CCMS
- Supply chain security and risk policy

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Q&A

End