The PoDIUM Platform Architecture

Short Overview

Priv.-Doz. Dr.-Ing. Michael Buchholz
Ulm University (UULM)

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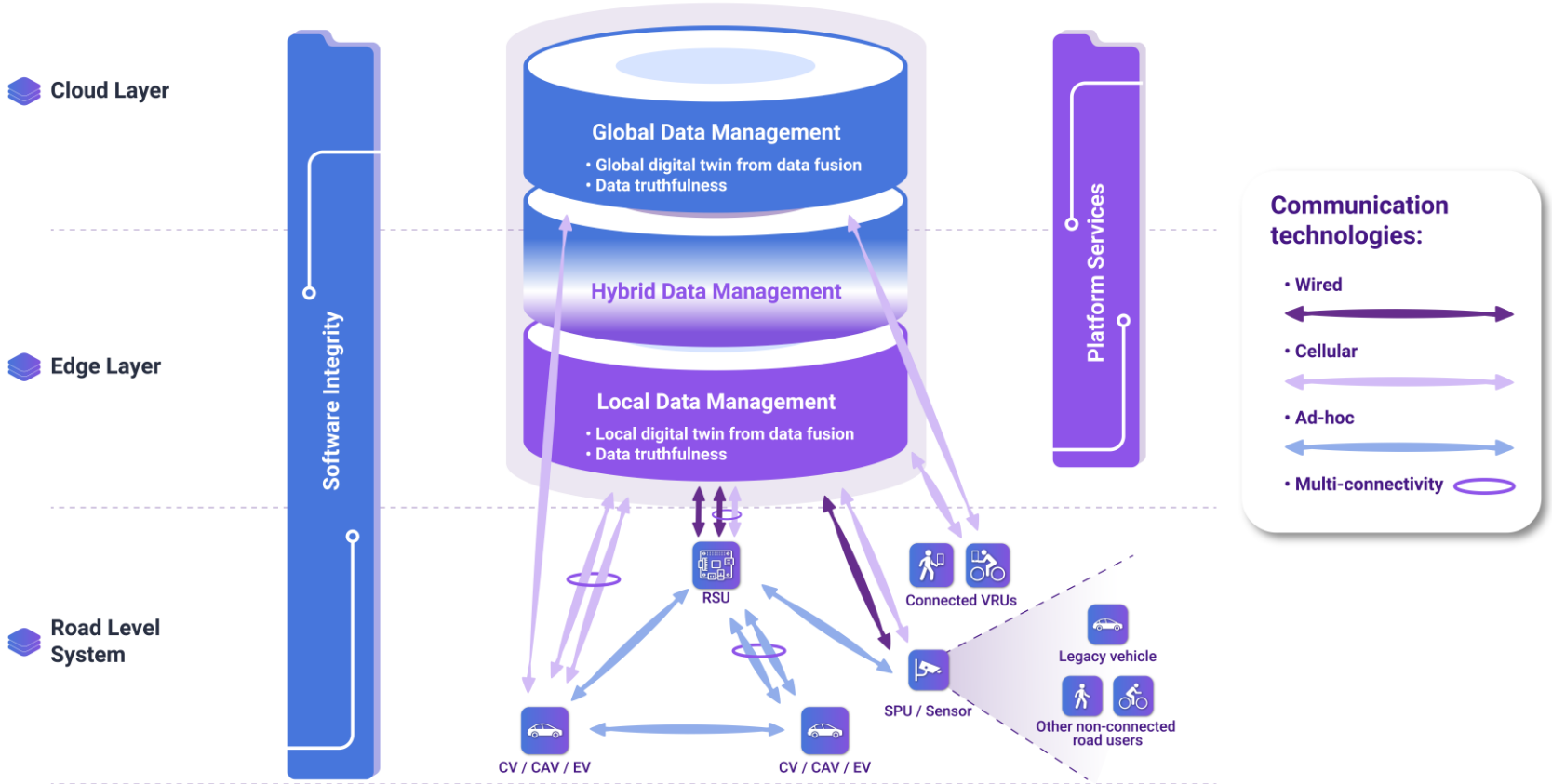
PoDIUM

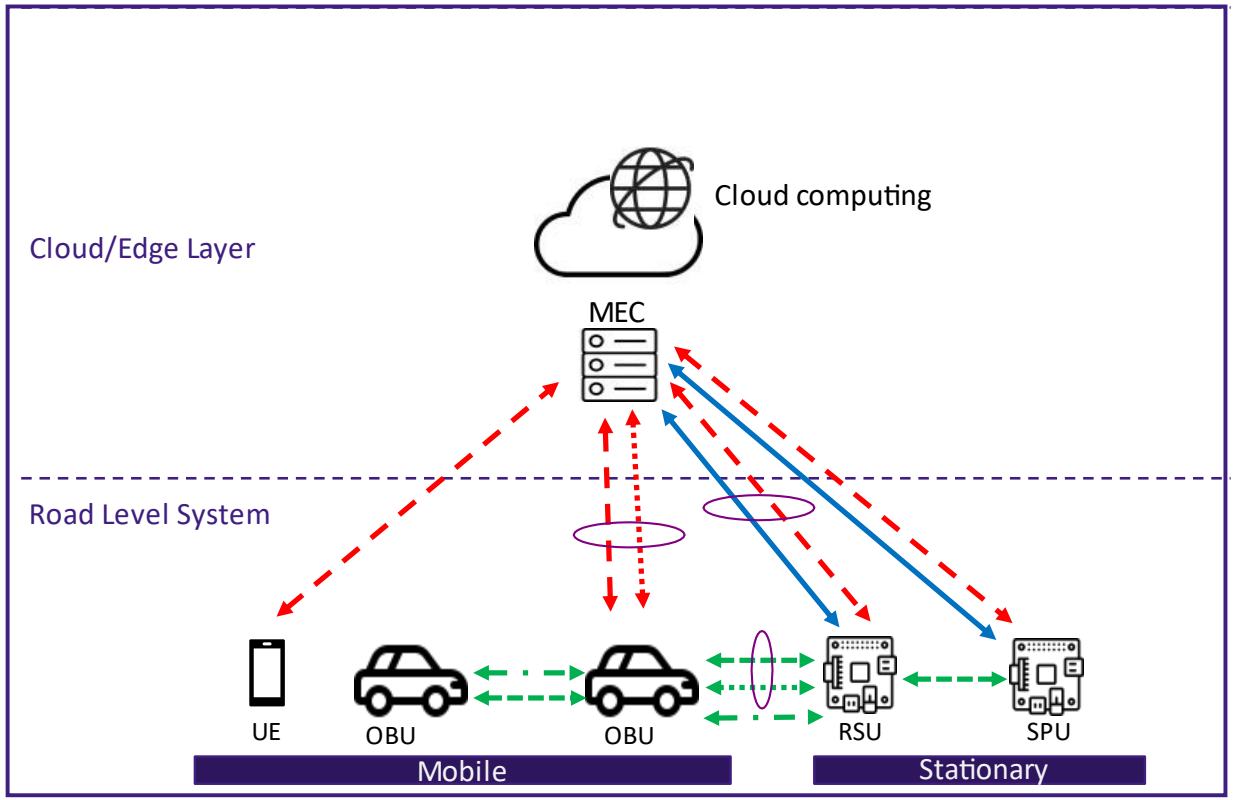
The overall PoDIUM architecture

- Based on earlier PDI reference architectures (e.g., ICT4CART)
- Extended by:
  - Hybrid Data Management
  - Multi-connectivity
  - Integration of VRUs
  - Digital Twin
  - Cooperative Services
  - Software Integrity and Trust Mechanisms
- Architecture derived in five different views, each focusing on different aspects for respective experts



Communication Architecture Overview

- Integration of mobile road-users and stationary road-side equipment via:
  - ITS-G5
  - Cellular mobile networks (5G) with cm-wave and mm-wave cells
  - Sidelink
  - 60-GHz-WiFi
  - Wired connections
- Redundancy of multi-connectivity for
  - enhanced bandwidth
  - enhanced reliability

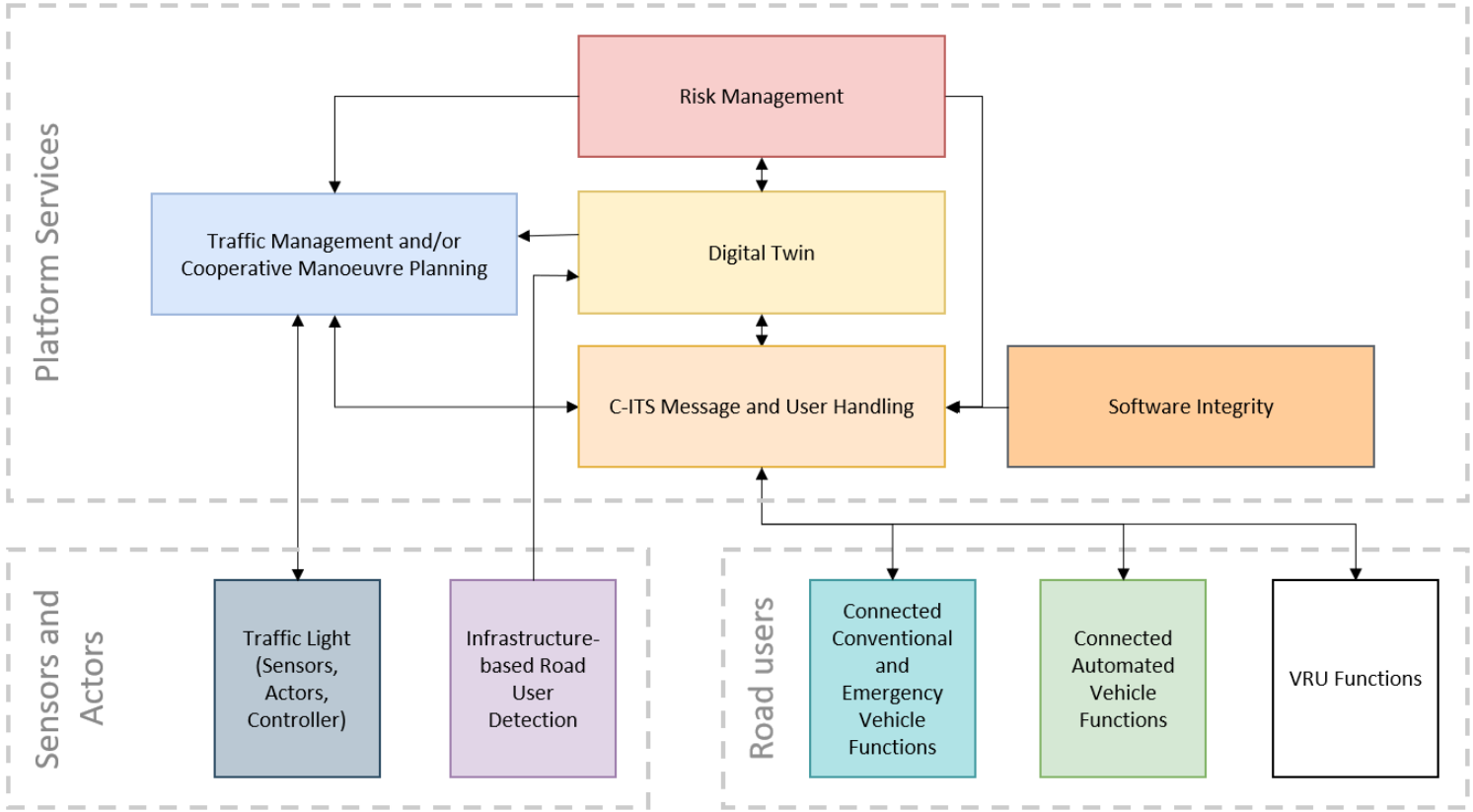


Communication technologies:

- Wired
- Cellular
  - cm-Wave
  - mm-Wave
- Ad-hoc
  - 60GHz WLAN
  - ITS-G5
  - SL (PC5)
- Multi-connectivity
- UE={EV, VRU, Shuttle user}

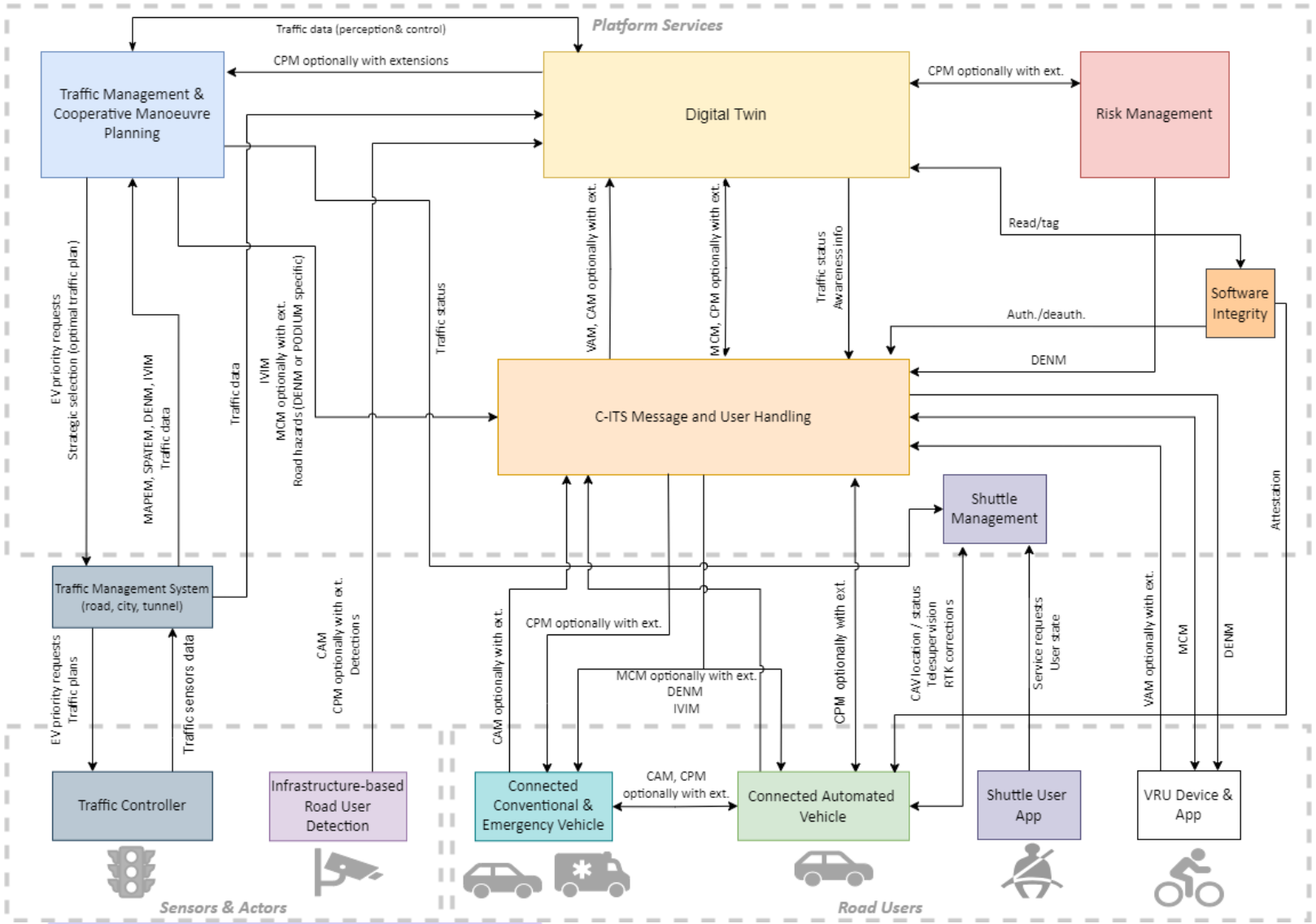
Functional Blocks Overview

- Main platform services and exemplary tasks:
  - **Digital Twin:** Providing a full environment model
  - **Traffic Management and Cooperative Maneuver Services:** Improve efficiency and safety of traffic flow
  - **Risk Management:** Warn road users in case of potential collisions
  - **Software Integrity:** Ensure integrity of included software components
  - **C-ITS Message and User Handling:** Make use of redundancy in communication



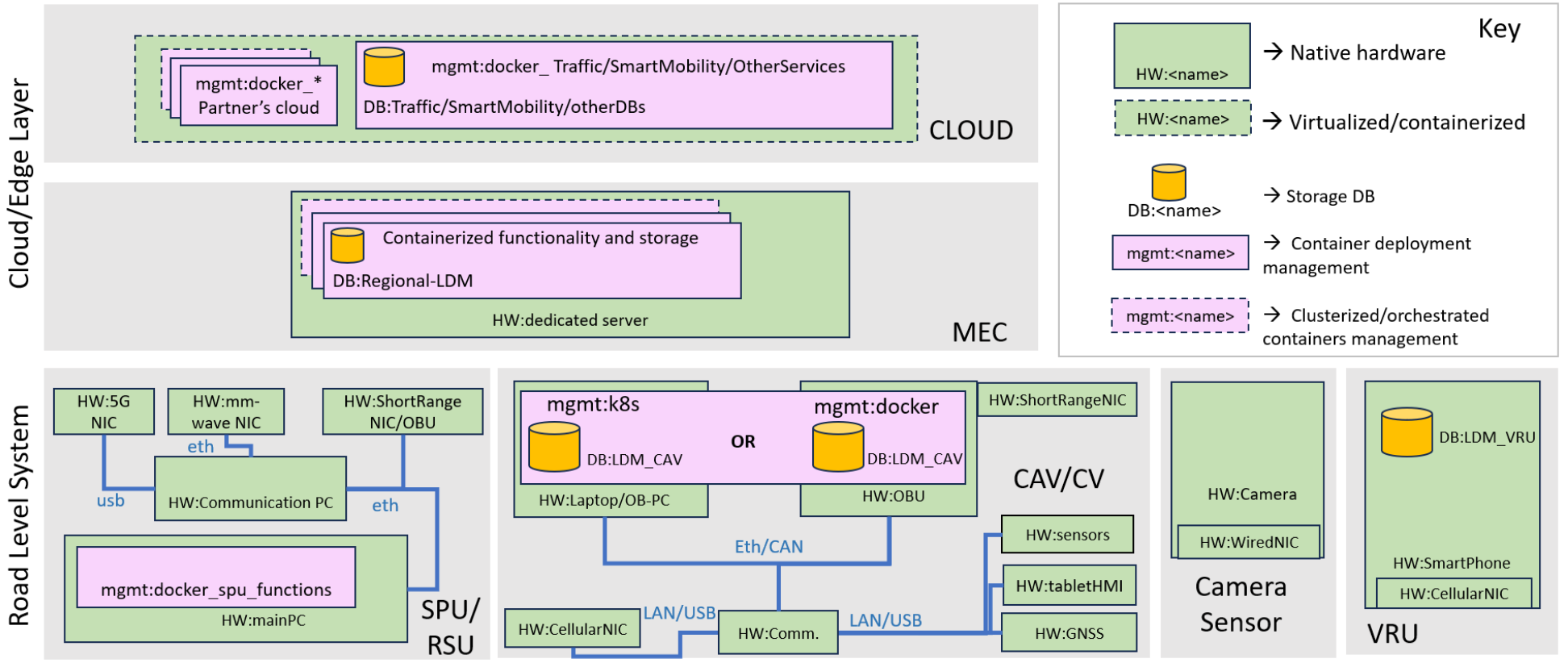
Data Flow Architecture Overview

- Data Flow between road users and services is based on ETSI messages
- Where possible, ETSI messages are also used for data exchange between services
- Extensions of current standard messages partly necessary for new functionalities (→ contributions to respective standardization working groups by partners)



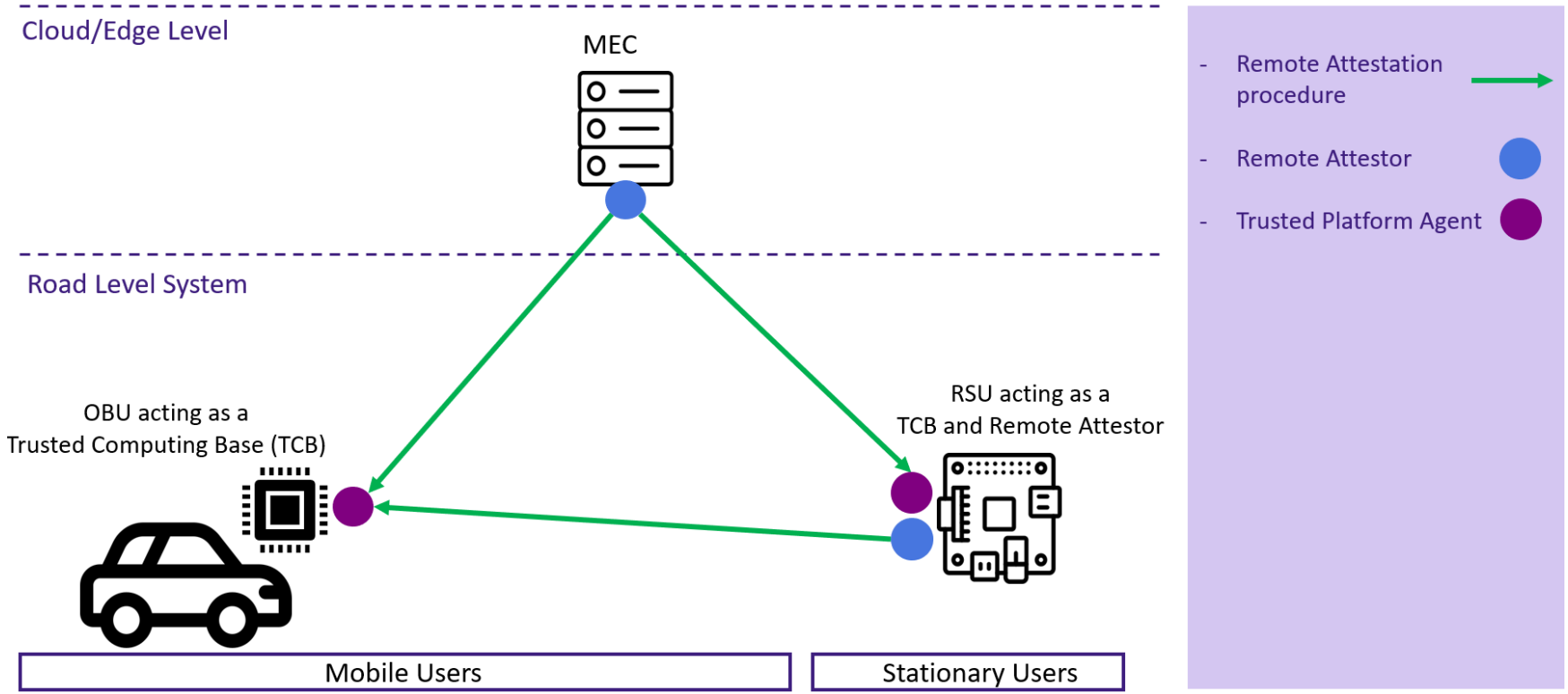
IT Environment Architecture Overview

- Deployment environment for functions/services /applications and data storage
- Hardware virtualization and containerization allow for flexible deployment



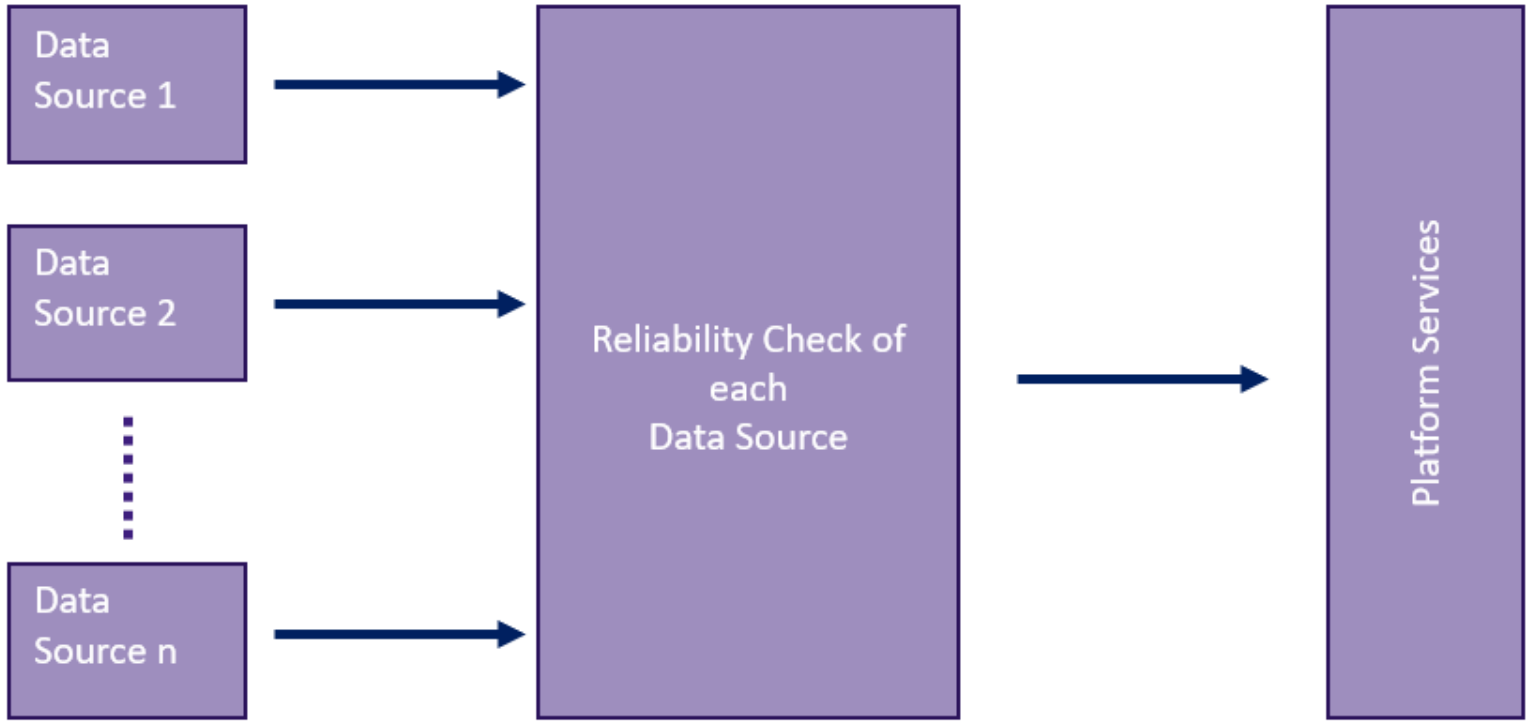
Software Integrity Architecture Overview

- Integration of trusted computing devices (e.g., trusted platform modules with trusted software stack)
- Remote attestation of software integrity



Data Truthfulness Architecture Overview

- Basic idea: Validate data before their integration and during processing
- Examples:
  - Use redundancy to check for erroneous data (sources)
  - Use self-assessment techniques to validate data processing outputs



Thank you!

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PD Dr. Michael Buchholz

Research Group Leader

Ulm University

e-mail: michael.buchholz@uni-ulm.de