Federation and API-driven edge access for automotive OEMs: Monetization and enhanced connectivity

Solution Proposal

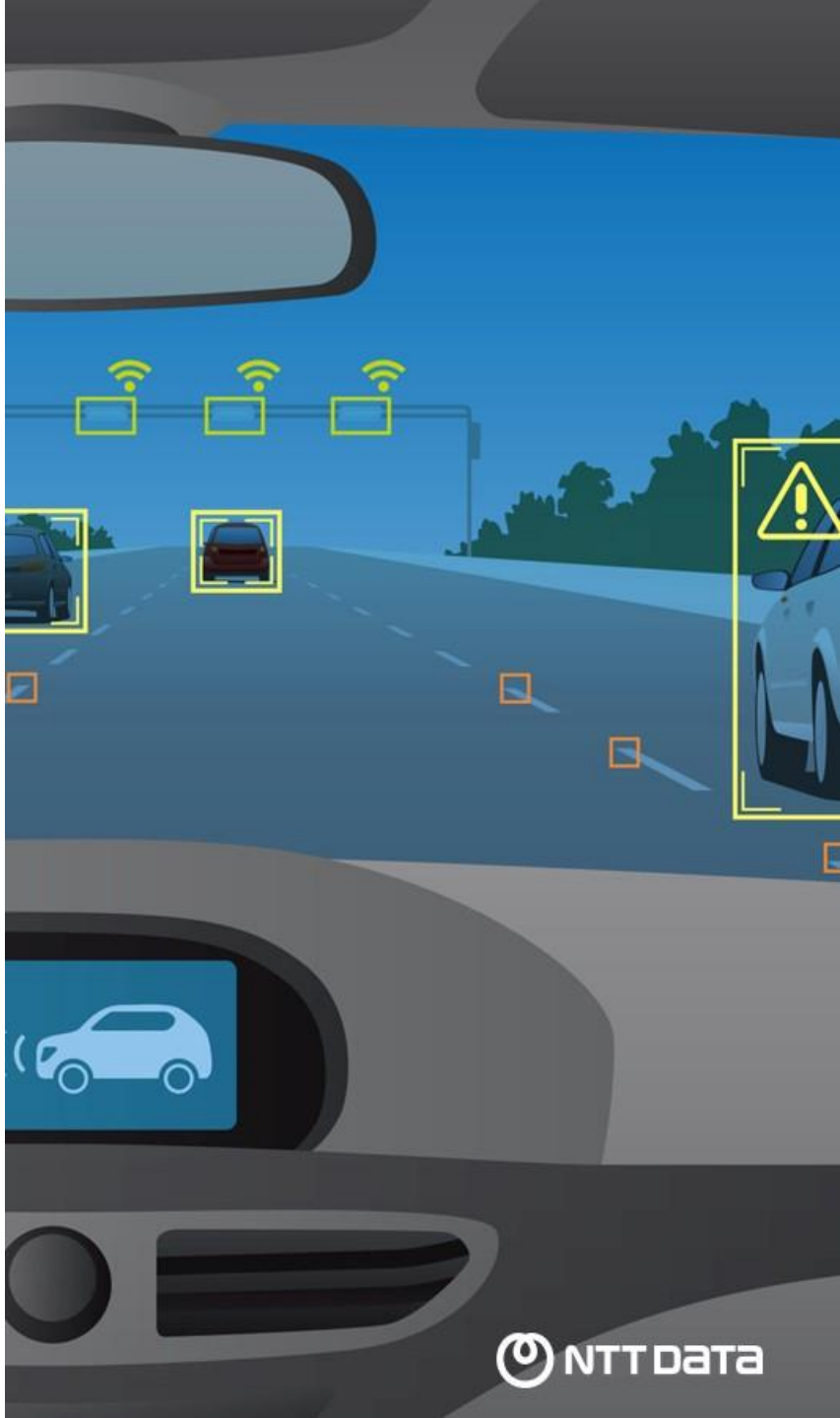
Feb, 2025

Challenge and Industry Needs

- **Pain Points for CSPs:**
  - Fragmented service interfaces limit scalability
  - Inability to efficiently monetize MEC and 5G capabilities
  - Complex cross-operator roaming with inconsistent handovers

- **Pain Points for Vertical Markets (Automotive):**
  - Expensive and complex global deployments
  - Limited low-latency network solutions for critical applications
  - Poor resource visibility for dynamic and optimized operations

- **Needs for CSPs and Verticals**
  - Unified API standards to streamline integration.
  - MEC and Edge computing resources for seamless connectivity.
  - Federated architectures for interoperability and service continuity.



Solution approach

- **Innovative Features** and **Enabling Capabilities:**
  - Standardized GSMA (including CAMARA) and TMForum APIs
  - GSMA Roaming Federation for seamless cross-operator handovers
  - 3GPP Edge/MEC node model
  - “Network drives the Vehicles” concept
  - AI-controlled capabilities for Edge resource optimization (exploiting NTT DATA contribution to EU Funded “MLSysOps” project results)

- **Key Components:**
  - Federation Broker to manages multi-operator Edge/MEC
  - Edge/MEC Integration: low-latency apps and service continuity

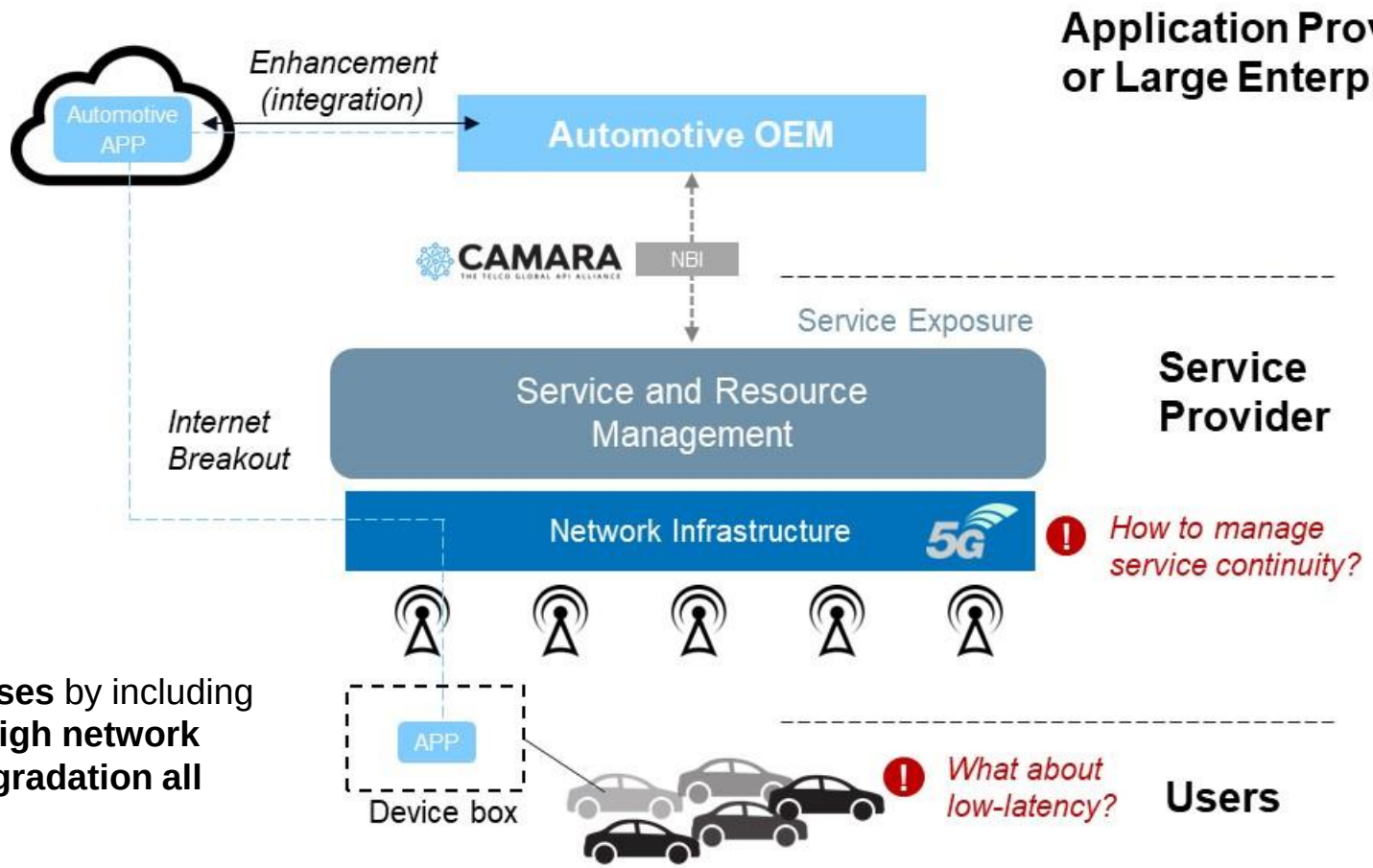
- **Business Benefits:**
  - Extension of currently available commercial use cases
  - Effort cost optimization for service design
  - Faster delivery over distributed network infrastructure

General Automotive Application schema

Internet-based Applications

Automotive device traffic is delivered over a Mobile operator infrastructure

End-to-end Automotive Applications are based on Internet connectivity



Points of attention:
How to **enhance automotive use cases** by including in scope **low-latency features and high network responsiveness** with **no service degradation all along the path**?

Edge Nodes: Enhance Vendor Applications

Introducing Edge Nodes

Automotive applications can be **enhanced with additional features** in real-time environment

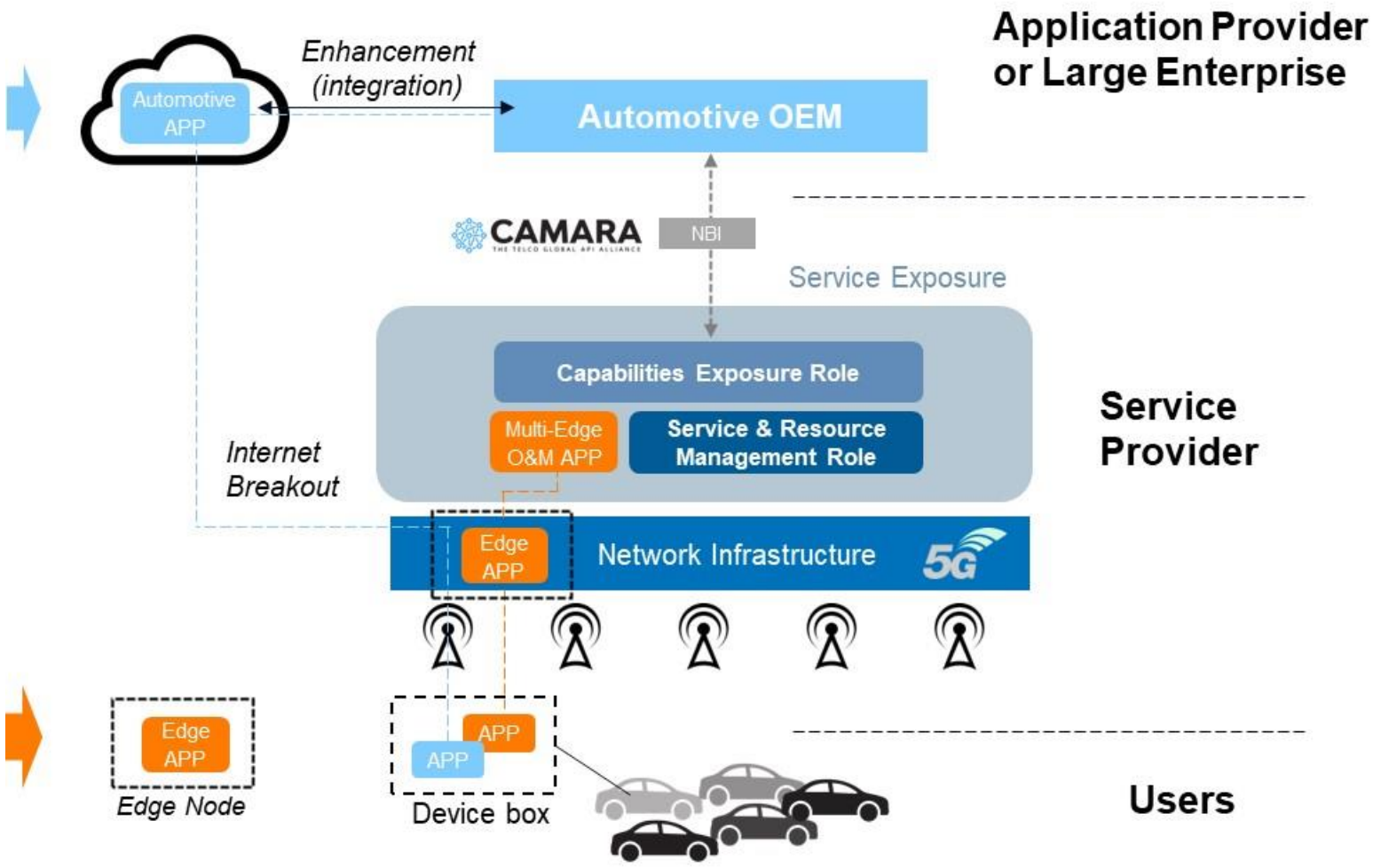
Edge processing **provide real-time performances** as required for OEM applications

APP Traditional client

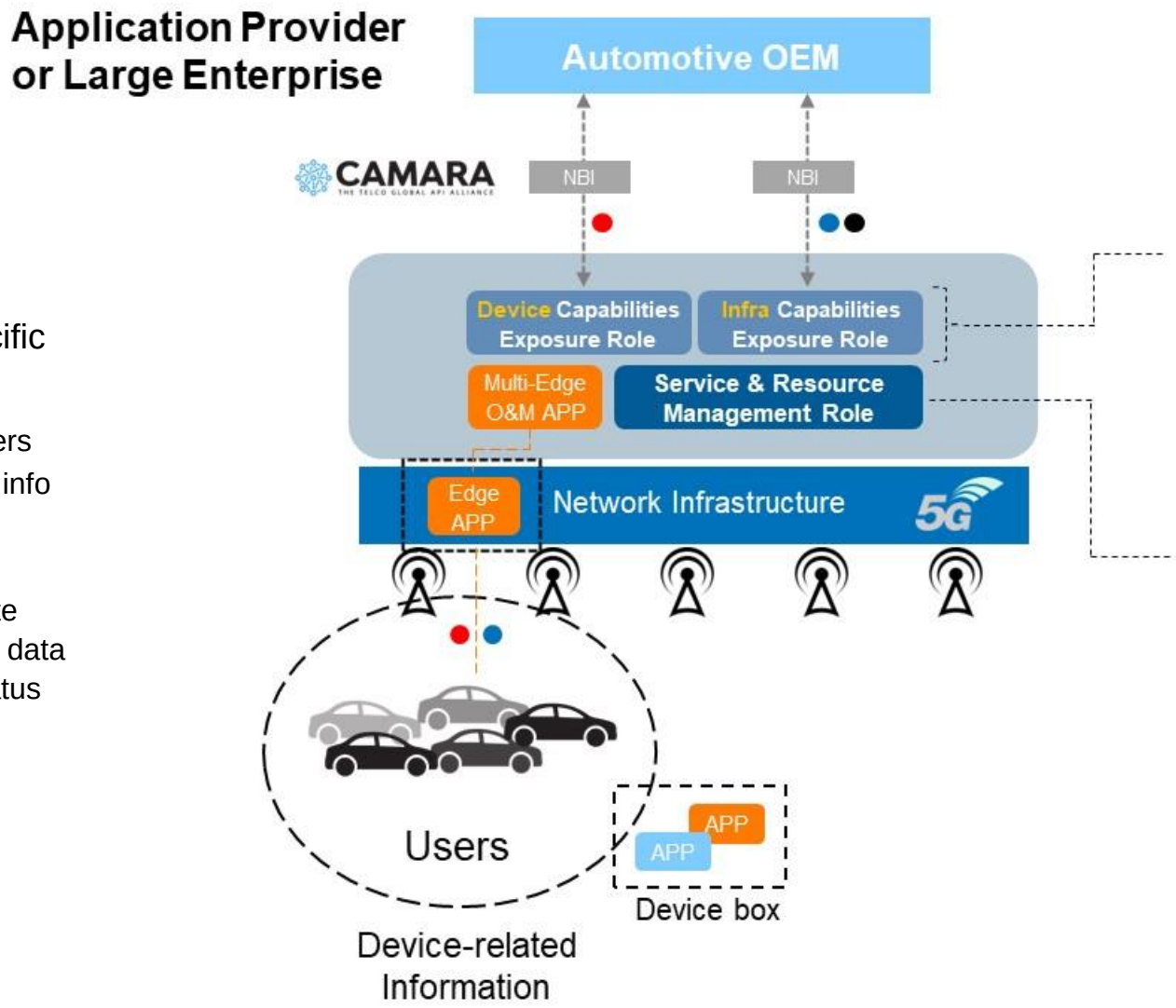
APP Edge client

Device Box upgrade

Edge Nodes are network bricks aimed to **interact with mobile devices** in **low-latency** conditions



Edge (MEC) Application Flows for Service Provider



Dynamic Data

- Application-specific
  - Geo-position
  - Traffic parameters
  - Sensor-specific info
- Device O&M
  - Operational state
  - Radio coverage data
  - Connectivity status

Service Exposure

Service presentation could be kept separated between devices/resource inventory information and application-specific information, just like mobility, environmental, heath parameters

Service Provider

Infrastructure Inventory

- Edge distribution
- Radio Tracking Areas
- Geo-fence
- Edge neighbors
- E-SIM provisioning
- Data centers
- MEC node profiles

Device Box Upgrade

Redundancy and Service Continuity

Dual Modem equipment with independent (e-SIM) mobile IMSI

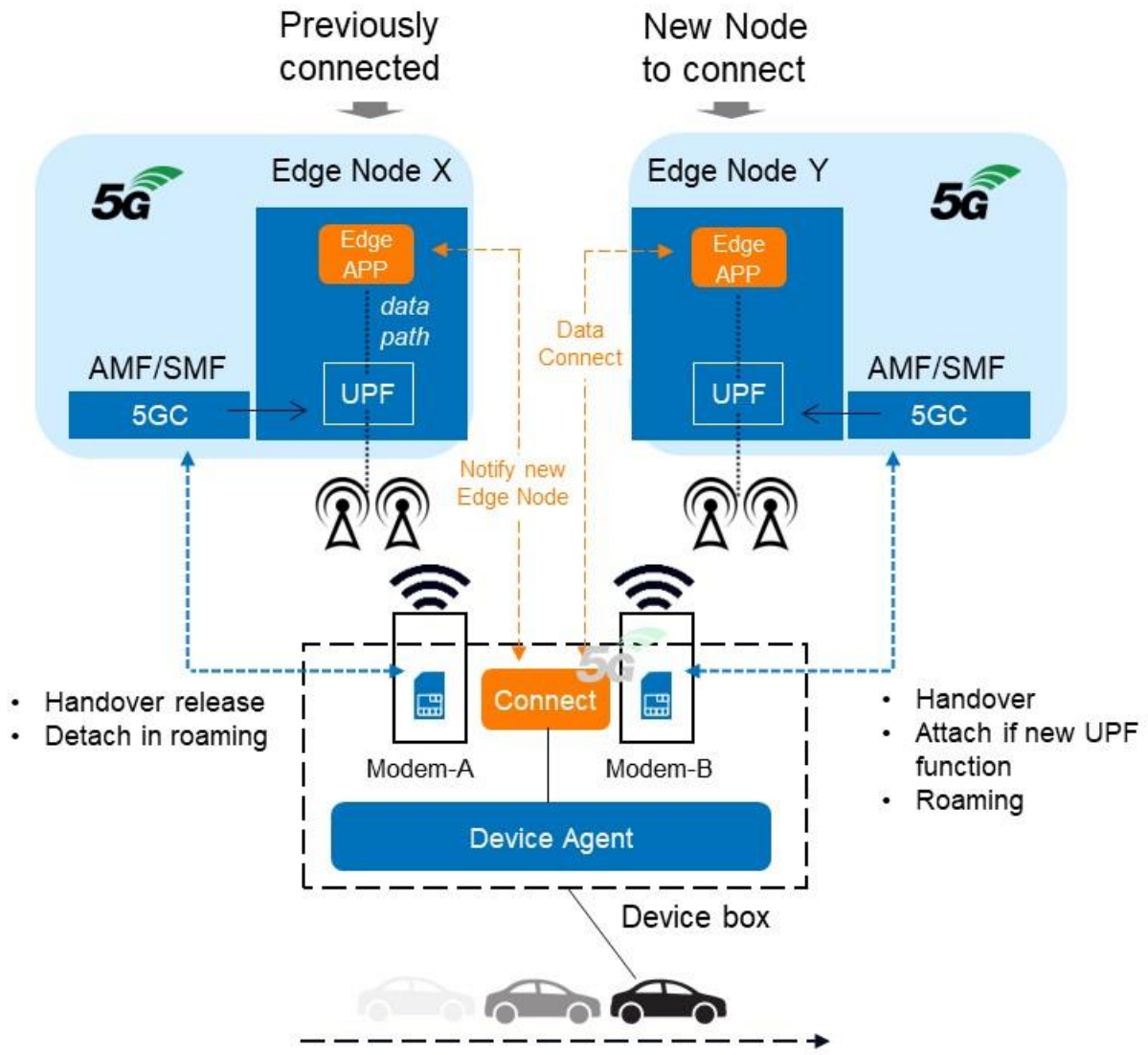
Software “Connect” functionality appointed to manage:

- Handover (same Operator)
- Edge Node handover (same Operator, different UPF function)
- Roaming (different Operator, new attach, new UPF function)

Device Agent functionality interacts with “Connect” functionality to select the bearer connectivity

5G Core Network User Plane Function (UPF) is part of the “Edge Node” description

- Assigned by configuration (resource Inventory)
- Provided with Network Slice profile

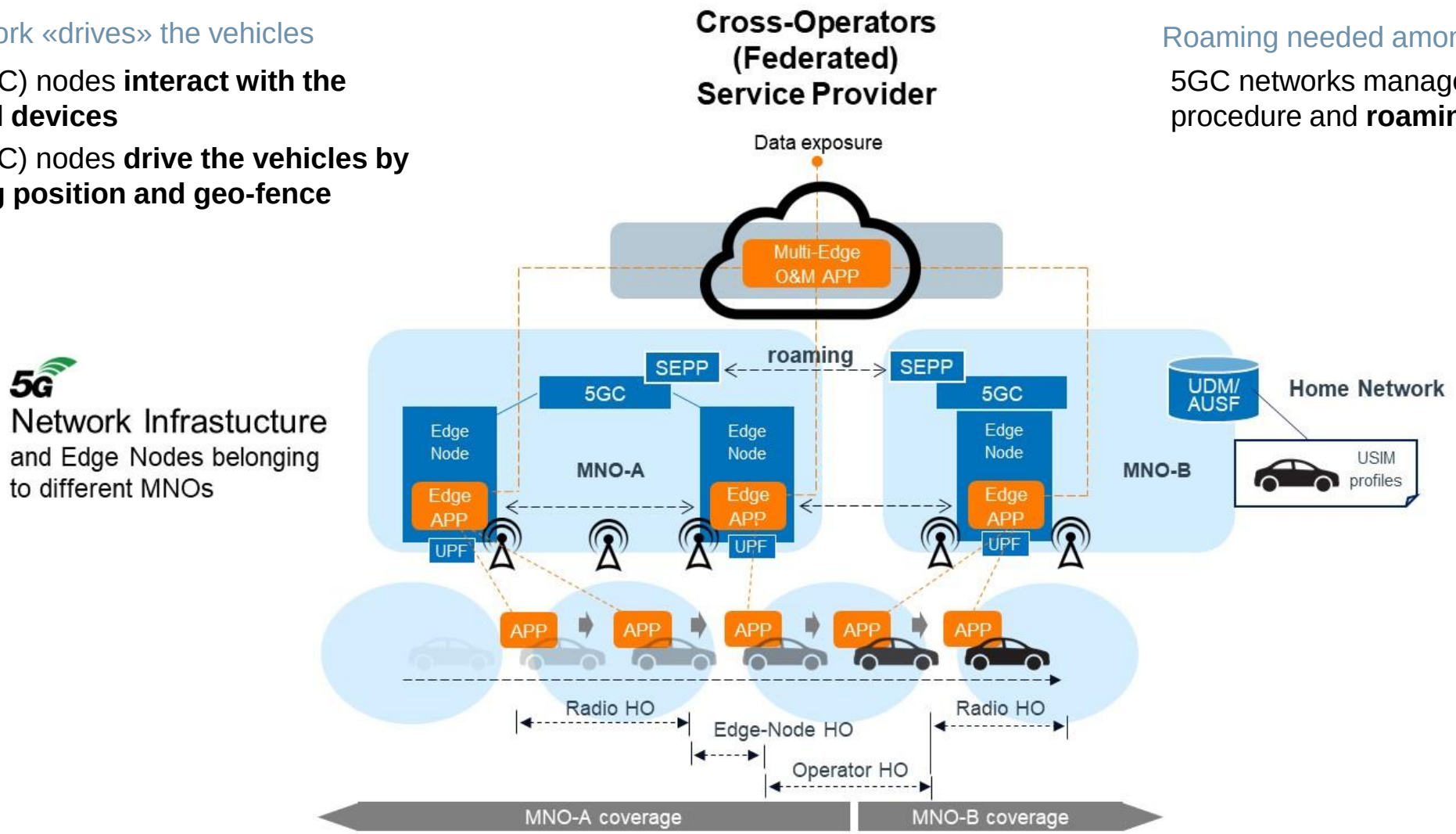


Network Abstraction concept

The Network «drives» the vehicles

Edge (MEC) nodes **interact with the individual devices**

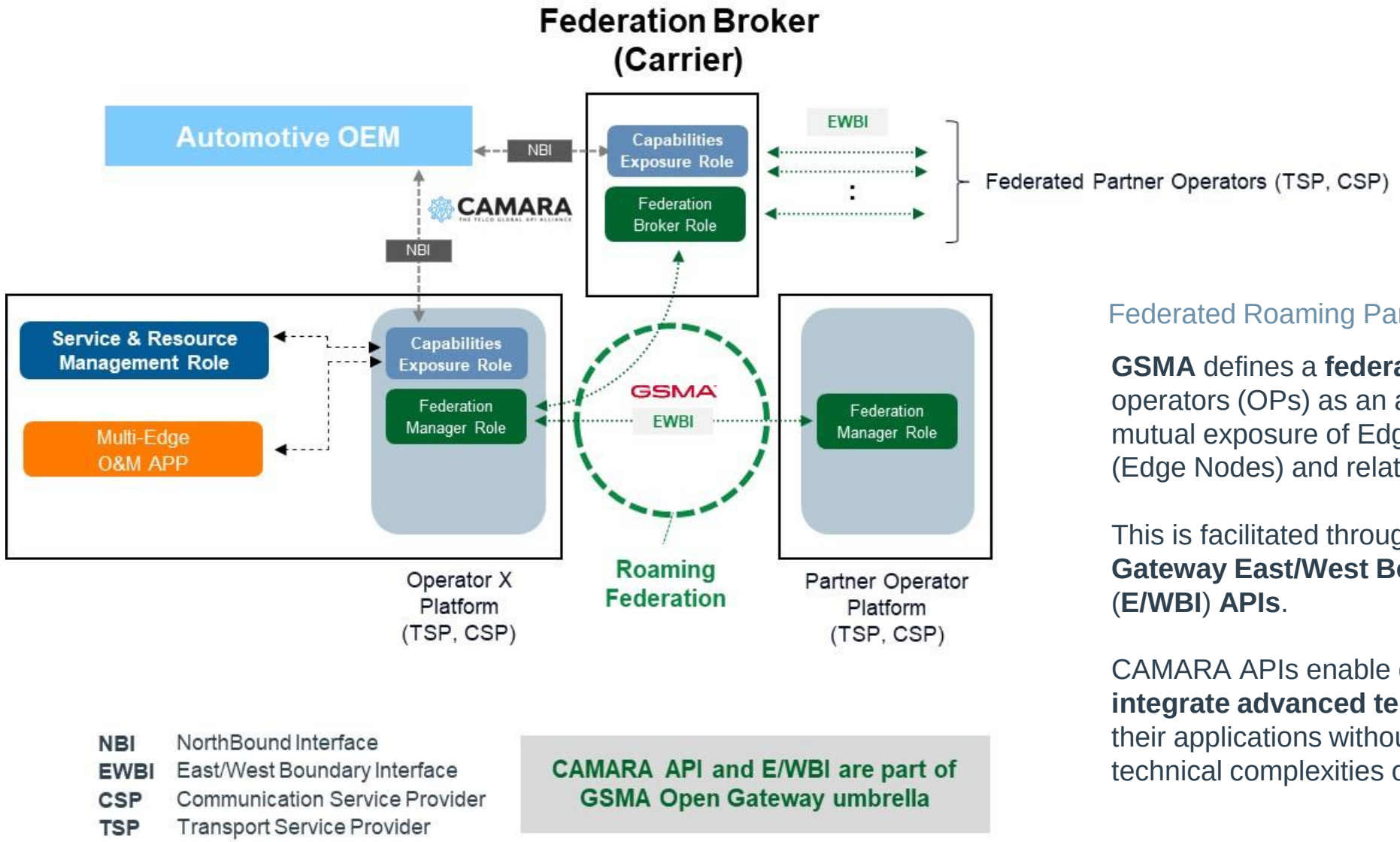
Edge (MEC) nodes **drive the vehicles by managing position and geo-fence**



Roaming needed among partner MNOs

5GC networks manage **handover** (HO) procedure and **roaming scenarios**

Roaming Federation



Federated Roaming Partners and Broker role

GSMA defines a **federation** between two operators (OPs) as an agreement allowing the mutual exposure of Edge Cloud resources (Edge Nodes) and related MEC capabilities.

This is facilitated through the **GSMA Open Gateway East/West Boundary Interface** (**E/WBI**) **APIs**.

CAMARA APIs enable developers to **easily integrate advanced telco functionalities** into their applications without dealing with the technical complexities of network infrastructure.

Thank you!

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