AECC

AUTOMOTIVE EDGE
COMPUTING CONSORTIUM



A Statement of Requirements to Accelerate Development of Interoperable Advanced 5G Network Services

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The Automotive Edge Computing Consortium (AECC) is communicating to mobile network operators (MNOs) globally that current network design doesn't scale to the ambitions of the automotive industry.

Current global network infrastructure is not suitable for the demands of the emerging connected vehicle. Huge traffic volumes put strain on the network, and uplink demands are not met by current mobile networks.

As the automotive industry's demands grow, standardized, scalable and programmable network infrastructure available via application programming interfaces (APIs) becomes essential. Increasing demands on network quality of service and traffic volumes necessitate networks that can adapt to meet these evolving needs.

The AECC is working with GSMA Fusion, an initiative focused on solving the needs of industry sectors, including utilization of GSMA's Open Gateway initiative. GSMA Fusion is a global GSMA activity in relation to a common interoperable and federated network with open standard interfaces to enable seamless universal connectivity and other technical capabilities across mobile networks

With GSMA Fusion, AECC is exploring the mobility ecosystem to address existing pain points and unlock value creation opportunities for OEMs, autonomous vehicle providers, and other industry players through advanced 5G network services.

Overview

The automotive industry is on the brink of a technological revolution. Emerging services like intelligent driving, high-definition map generation, and teleoperation are set to transform the driving experience. However, these advancements require huge traffic volumes and low latency, which the current network infrastructure would struggle to manage.

The AECC advocates for collaboration among telecommunication companies and automotive manufacturers to ensure future network infrastructure supports these advancements. To that end, the AECC is pleased to be participating in the GSMA Fusion's Automotive Topic Forum which includes other players from the automotive industry, such as associations and vehicle manufacturers, to help shape the future of connected vehicles. We call on other players in the automotive space to join us at the GSMA Topic Forums to further develop common requirements for the industry.

Together, we can unlock the full potential of connected vehicles and create a safe, more efficient, and more sustainable transportation ecosystem.

AECC Concepts

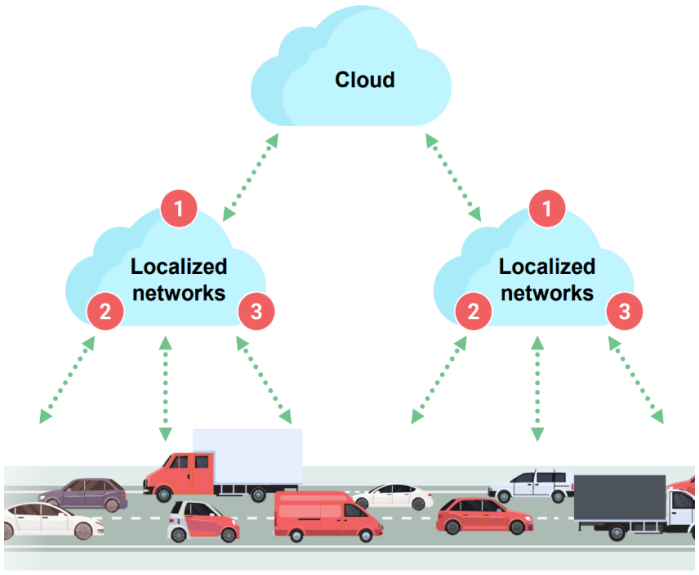
To accommodate the increasing data traffic and high capacity demands from new markets like the automotive sector, an improved communications offering is needed. This presents an opportunity to design future networks that can provide new services to these markets and generate new revenue for mobile network operators. Collaboration among communication technology companies and automotive manufacturers is crucial to address these challenges.

Distributed Computing on Localized Network

To address data processing and traffic volume challenges in current mobile and cloud systems, this concept involves using localized networks to manage vehicle connectivity in specific coverage areas, with added computation power to process local data and provide timely responses to connected vehicles.

This distributed cloud concept has three key aspects:

1. **Localized network.** A local network that covers a limited number of connected vehicles in a certain area. This splits the huge amount of data traffic into reasonable volumes (per area of data traffic) between vehicles and the cloud.
2. **Distributed computing.** Computation resources are geographically distributed within the vicinity of the localized networks' terminations. This reduces the concentration of computation and shortens the processing time needed to conclude a transaction with a connected vehicle.
3. **Local data integration platform.** Integration of local data by utilizing the combination of the localized network and distributed computation. By narrowing relevant information down to a specific area, data can be rapidly processed to integrate information and notify connected vehicles in real time.



Ask of Mobile Networks and Ecosystem Players

Opportunity

There is currently a disconnect between the supply of advanced 5G network services and the demand for them. While innovative mobile network functionality, including programmability and other network APIs are being rolled out by selected operators worldwide, they are not scaling quickly enough to meet the global demands of industry verticals which have solutions requiring this functionality, such as the automotive sector.

Edge Computing for Automotive Use

The AECC invites stakeholders (MNOs, channel partners, API aggregators and ecosystem companies) to participate in deploying the reference architecture for next generation connected vehicles. By combining edge computing, AI-enabling technologies, and improved radio access technologies, the AECC aims to create a roadmap for the future.

While existing 4G and 5G technologies can handle many of the demands from the automotive industry today, there is a desire for ubiquitous, interoperable, programmable networks capable of the major shift in automotive connectivity requirements that is coming.

Phased investment into network infrastructure such as multi-access edge computing (MEC), edge cloud and the continued evolution of network quality of service with 5G differentiated connectivity introduction will allow the automotive industry to scale up the number of connected vehicles with increased capabilities demanded by drivers and passengers globally.

Benefits for MNOs

Greater collaboration between the telecommunications industry and the automotive industry will reap benefits for both. Aligning automotive OEMs with MNOs globally creates opportunities for co-innovation in connected vehicle services, and accelerated adoption of 5G.

There are revenue growth opportunities through the monetization of 5G capabilities, for example by leveraging network APIs such as quality on demand and edge cloud to unlock new revenue streams from verticals like automotive. These APIs in turn enable the automotive industry to monetize premium services from automotive customers.

Three Key Use Cases and Requirements from MNOs to Deliver Them

The AECC has identified the following as their three key use-cases to address.

This is not an exhaustive list but shows where we think there will be significant demand for advanced network functionality.

Key Use Case One: Intelligent Driving

Intelligent driving currently means safe and efficient driving support, but over time will incorporate autonomous driving. In this context, vehicles need to exchange vast amounts of data with applications in the cloud.

What: Requirements related to network APIs (existing APIs or possible new APIs) include edge cloud and quality of service guarantees.

Where and when: In developed countries, the full-scale penetration of intelligent driving will begin in three to five years as global availability of 5G advanced networks becomes ubiquitous.

Key Use Case Two: High-definition Map

The high-definition map consolidates static and dynamic information (e.g., vehicle position, pedestrians and obstacles) and is essential for autonomous driving. Creating and distributing the map require many data transactions with high capacity as well as efficient processing to keep the information up to date.

What: Requirements related to network APIs (existing APIs or possible new APIs) include quality of service guarantees and emergency broadcast services. Any other non-network API requirements: time stamp, and direction analysis.

Where and when: High-definition map technology is the foundation of intelligent driving, so it needs to be completed before intelligent driving.

Key Use Case Three: Teleoperation

Teleoperation is a service scenario where an operator remotely drives a vehicle or a machine via network.

The core concept of teleoperation is to augment and extend human capabilities beyond geographical barriers. By removing constraints on the location of operators and their devices, teleoperation can provide new opportunities for people facing physical or geographical challenges and thus improve diversity and inclusion. Furthermore, teleoperation can encourage people to engage in value-added work by replacing low-value or hazardous manual tasks with remote operations.

What: Requirements related to network APIs (existing APIs or possible new APIs) include edge cloud, quality of service guarantees, hand over to another MNO edge cloud. Any other non-network API requirements include network slice booking.

Where and when: In developed countries where the working population is shrinking, the full-scale penetration of teleoperation will begin in private areas, such as factories, by 2028.

AECC in 2025

In 2025, the AECC will solidify its position as the authority defining the end-to-end digital infrastructure for mobility evolution. AECC will advance frameworks and proofs–of-concept (POCs) that address the challenges of real-time data processing, low-latency communication, and sustainable edge-to-cloud architectures, enabling innovations in autonomous driving systems, digital twin ecosystems, premium vehicle services, and AI-driven automotive solutions. The integration of networking APIs will unlock new opportunities, streamlining seamless connectivity and accelerating the deployment of next generation services for connected mobility. Additionally, AECC will champion green computing platforms to align with industry sustainability goals, ensuring the mobility sector evolves with efficiency, scalability, and environmental responsibility at its core.

The AECC will also be releasing its strategic blueprint, a comprehensive framework designed to address the challenges and opportunities within the rapidly evolving connected vehicle ecosystem. By adopting the AECC blueprint, industry stakeholders can streamline the development and deployment of connected vehicle technologies, ensuring enhanced user experiences while overcoming technological and operational hurdles.

The automotive industry is undergoing a profound transformation with the rise of connected vehicles and mobility services. To deliver intelligent services and superior customer experiences, the industry must develop innovative ways to collect, manage, process, and utilize vast amounts of data. However, this process comes with significant challenges, including:

- Managing enormous and fluctuating simultaneous connections.
- Processing massive data flows.
- Maintaining target response times.
- Achieving cost-efficient data processing.

To address these challenges, the AECC's blueprint advocates for a distributed solution that delivers several key benefits:

1. **Optimized data transfer:** Distributing the data transfer load across the network eliminates bottlenecks and stabilizes communications.

2. **Scalable data processing:** Utilizing edge infrastructure to distribute workloads prevents computational overload and ensures low-latency responses.
3. **Enhanced resilience:** Incorporating multiple infrastructures mitigates system failures by enabling seamless failover in case of outages.

The blueprint outlines the architecture and technologies necessary for implementing such a system, explores practical business use cases, provides critical insights into solution implementation, and highlights POC activities validating these advancements.

Key focus areas of the AECC blueprint:

1. **Use cases:** Showcasing scenarios where edge computing is essential or provides substantial added value.
2. **Architecture and technology:** Detailing the infrastructure and technological requirements for large-scale edge deployments.
3. **Application design:** Offering guidance on developing edge applications, including distributed data processing techniques.
4. **Solution development:** Emphasizing the importance of PoCs, early adoption efforts, and market testing strategies.

Driving Innovation in Edge Computing Markets

The AECC blueprint aims to inspire innovation and accelerate the growth of edge computing markets by providing clear, actionable guidance and insights. By leveraging the blueprint, industry players can unlock the full potential of connected vehicle technologies while addressing critical data processing and operational challenges.

The AECC will be inviting stakeholders across the automotive and technology sectors to explore the blueprint after MWC 2025 and join the effort to shape the future of connected mobility.

Participate in the AECC's Proof-of-Concept Program

Organizations interested in collaborating with the AECC on a POC can initiate the process by contacting ProofofConcept@aecc.org. For a glimpse into how AECC's ongoing POCs successfully address data challenges, access POC case studies and on-demand videos at https://aecc.org/proof-of-concepts/.

Collaborate with OEMs, MNOs, Cloud Providers and App Players

All companies interested in contributing to the connected vehicle services ecosystem are encouraged to become AECC members. AECC membership is open to organizations across any business vertical. To learn more about AECC membership, visit https://aecc.org/membership/.

Q&A

Can additional companies get behind this statement?

Yes, please contact AECC at this email address: ProofofConcept@aecc.org

Can additional companies join the GSMA Fusion Topic Forum?

Yes, we encourage other companies within the automotive sector who are GSMA members or signatories to co-operation agreements with GSMA Fusion are welcome to participate. GSMA Fusion is aggregating use case demand to create common industry requirements.

Who benefits from taking action?

Our aim is to bridge the gap between supply and demand, by demonstrating that there is a market for new, defined technologies from the automotive industry, if mobile network operators invest in creating the capability.