

# Car IoT and new connectivity perspectives with SparkLink

Francois FISCHER, FSCOM - AIOTI Mobility Chair

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The Alliance of IoT Innovation was founded in 2016 with the support of the European commission to promote and support collaboration in IoT, Edge Computing and other converging technology.

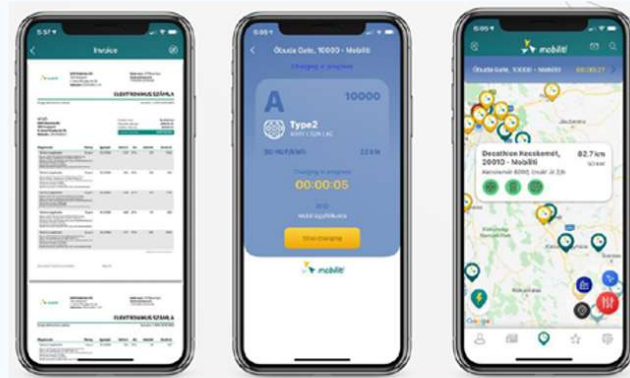
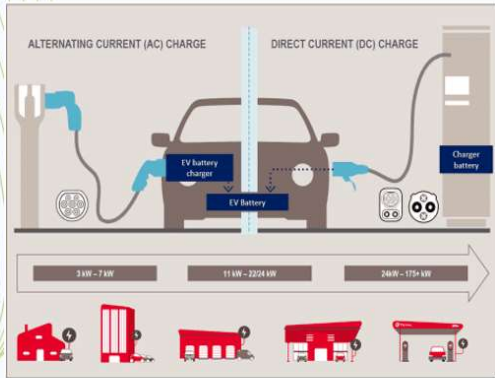
AIOTI members drive business, policy, standardisation, research and innovation development across the Digital Value Chain to support European digitisation and competitiveness

**The Mobility Working Group supports Member initiatives on their deployment of Mobility Application and Services with a recent focus on User experience of next Generation vehicle, Electromobility and Spatial web**



Mobility WG leaders:  
Chair: Francois Fischer, FSCOM  
co-chair Omar Veledar, AVL

# AI@TI vision on Services, Data Marketplaces and Architecture



Advocate about EV charging



SESSION ORGANISERS  
TOWARDS 2030: RESHAPING THE EUROPEAN ENERGY SYSTEM  
#EUSEW2021



## IoT Solutions World Congress 2022

BE THE GAME CHANGER

EV CHARGING  
INFRASTRUCTURE  
USE CASES



**FRANCOIS FISCHER**  
Managing Director



**BENJAMIN NENNIG**  
Energy Program Director



**MINH LE**  
Distinguished Expert



**LAURENT SCHMITT**  
CEO



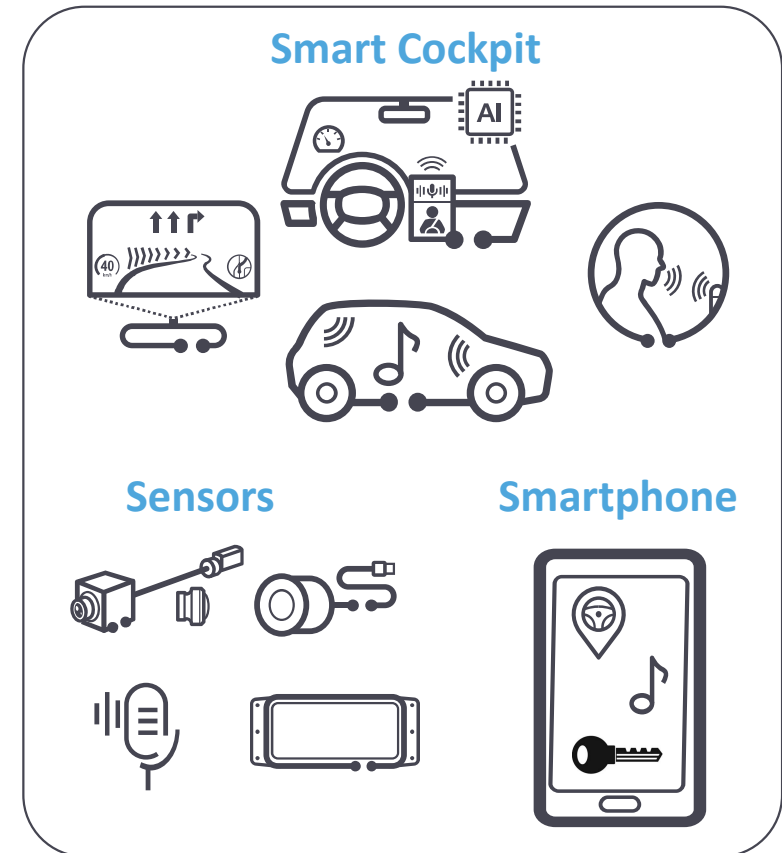
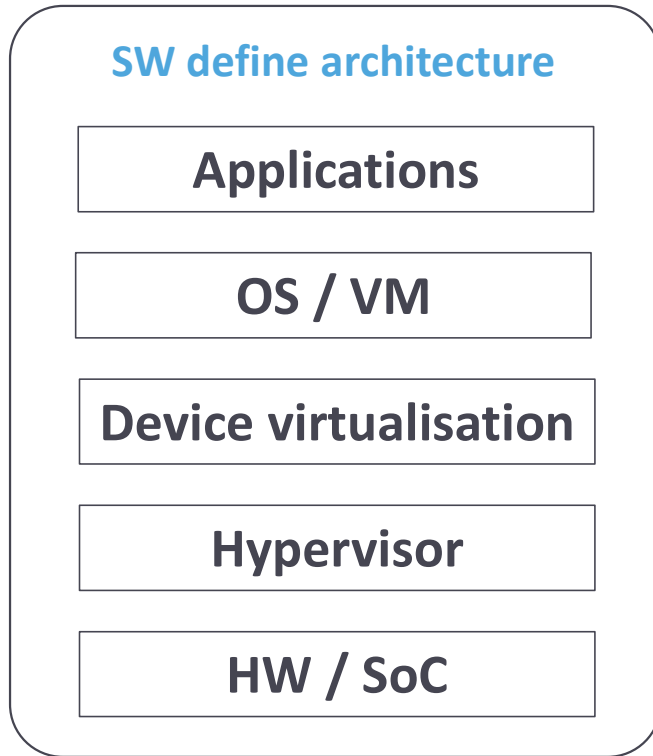
**JAIKRISHNAN PILLAI**  
CEO



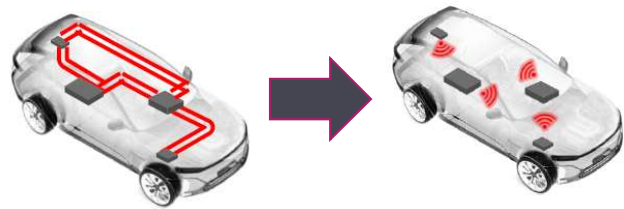
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# Car IoT - growing in-vehicle domain




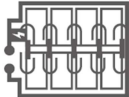


# Short range communication for Smart Cars



- Lower weight (~ 30kg) and number of connectors (300)
- Reduce design, integration and manufacturing costs
- Improve scalability and aftermarket

## Use case examples

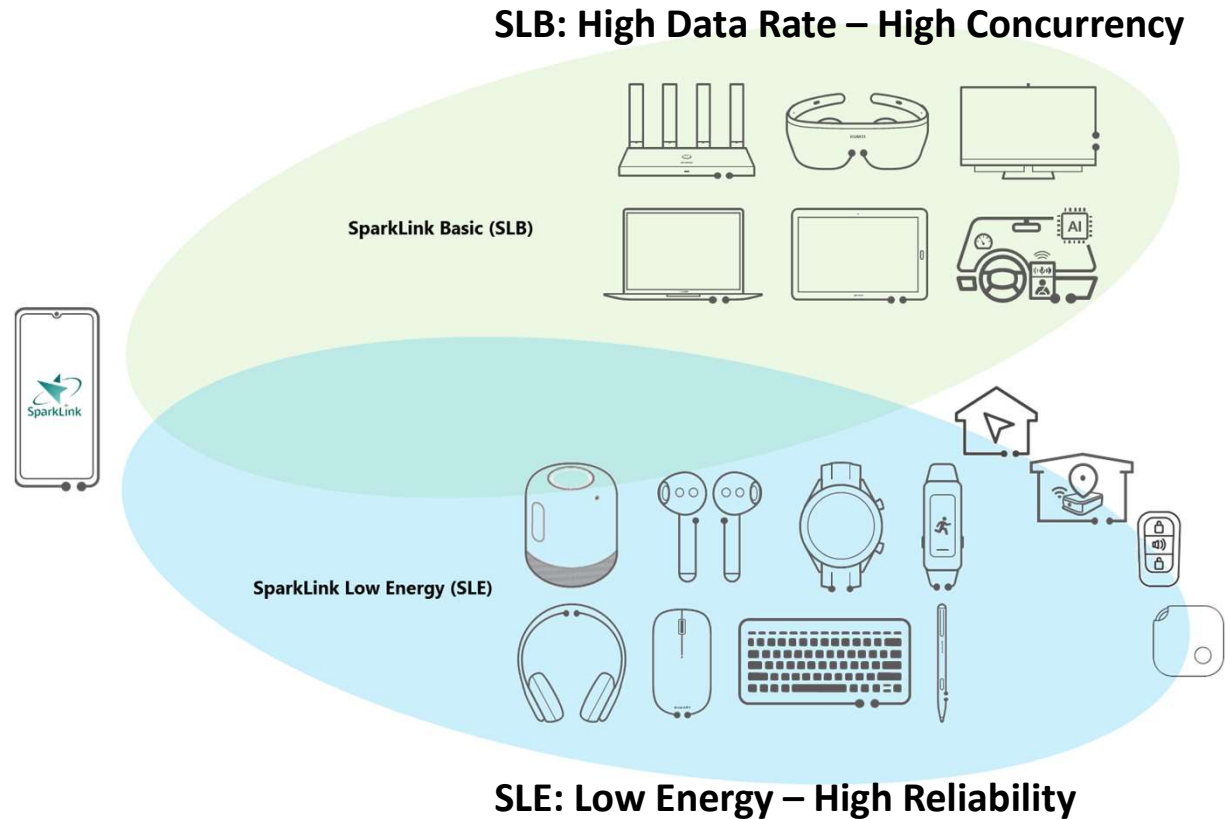
Sound & noise reduction	Screen interaction
 <ul style="list-style-type: none"> <li>• End2end latency</li> <li>• Synch accuracy</li> </ul>	 <ul style="list-style-type: none"> <li>• One way latency</li> <li>• Accurate synchronisation</li> </ul>
Passive access/start	Battery management
 <ul style="list-style-type: none"> <li>• Position accuracy</li> <li>• Reliability</li> </ul>	 <ul style="list-style-type: none"> <li>• Device Nr &gt; 300</li> <li>• Reliability</li> </ul>

# SparkLink for low-latency & low-jitter applications



Industry Alliance, established on 22 Sep. 2020, has addressed the IoT challenges and develops **multi-purpose wireless short-range communication technologies** and promote their industry ecosystem

SparkLink short range communication technologies supports applications in **smart cars, smart homes, smart terminals, and smart manufacturing** with extreme performance requirements



# SparkLink features for IoT

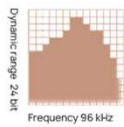


## High data throughput

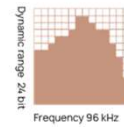
### L2HC High-resolution Codec



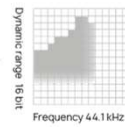
L2HC  
Transfer rate 960 Kbps



### AAC Codec



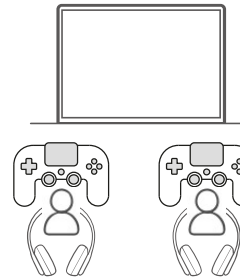
AAC  
Transfer rate 256 Kbps



- High-resolution audio experience requires a significantly higher PHY rate than 2Mbps.
- ✓ SLE boasts a PHY data rate of 12Mbps, enabling low-latency transport of 96KHz×24bit audio streams.

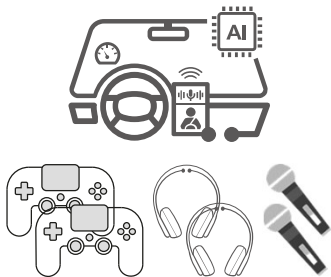
## Low latency interaction

### Central display



- Competitive gaming, e.g., fighting, e-sports, requires an input lag on the order of milliseconds. The audio delay needs to be sufficiently low in fast-paced gaming for perfect lip sync.
- ✓ SLE features air transport latency of 125μs, which translates to a polling rate of 4KHz for human-interface devices.

## Multi-device connection



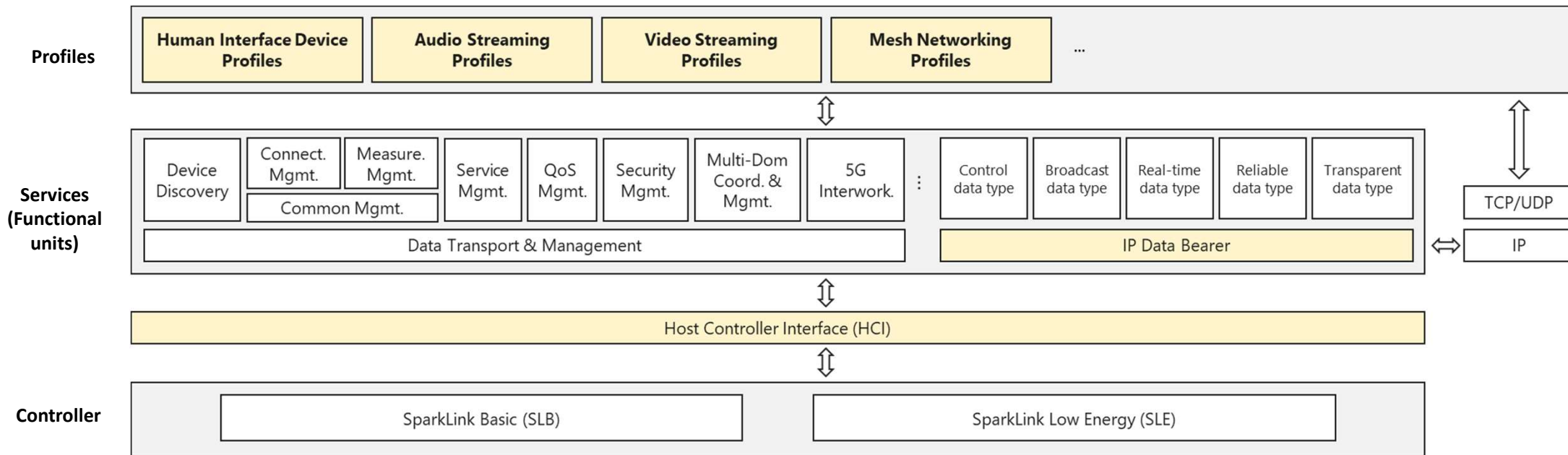
- In-vehicle entertainment, e.g., multiplayer gaming, watching movie, and Karaoke, requires the simultaneous connection of multiple peripherals with the infotainment system.
- ✓ SLE supports up to 256 concurrent device connections where contention-free channel access is enabled via centralized scheduling.

## Highly reliable communication



- Subway, train stations, airports, are usually crowded with 2.4GHz wireless devices, where co-channel/adjacent channel interference might cause the audio experience to cut out.
- ✓ SLE improves the receiver sensitivity by variable-rate Polar coding, which provides ≥3dB coding gain over CC at reduced complexity.

# SparkLink protocol stack design





# SparkLink Alliance



**240+ members**

Representative companies/universities/research inst. of the entire supply chain

**8 working groups**

Standardization, spectrum, test & certification, security, smart terminal/home/auto/manufacturing

**4 main application areas**

Smart terminal, smart home, smart auto, smart manufacturing

**27**

smart terminal/home device vendors

**42**

chipset vendors

**14**

ICT companies

**15**

test equipment vendors

**14**

universities/research inst.

**8**

Industry organizations

<http://www.sparklink.org.cn/en/>



# Thank you for listening

Any questions?

Contact: [francois.fischer@fscm.fr](mailto:francois.fischer@fscm.fr) – AIOTI Mobility WG chair