5G-MOBIX FR TS

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Lessons learned and Conclusion

Laurent FEVRIER : French Site Leader

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Key 5G benefits for CAM

End to End latency improvement for V2X with 5G-NR and MEC

Room for improvement with Rel16, 5G-SA and URLLC

Adaptive QoS

High Troughput

- Not important for V2X messages
- Permits Upload of raw data from AV (cameras, lidars)

Computation in MEC

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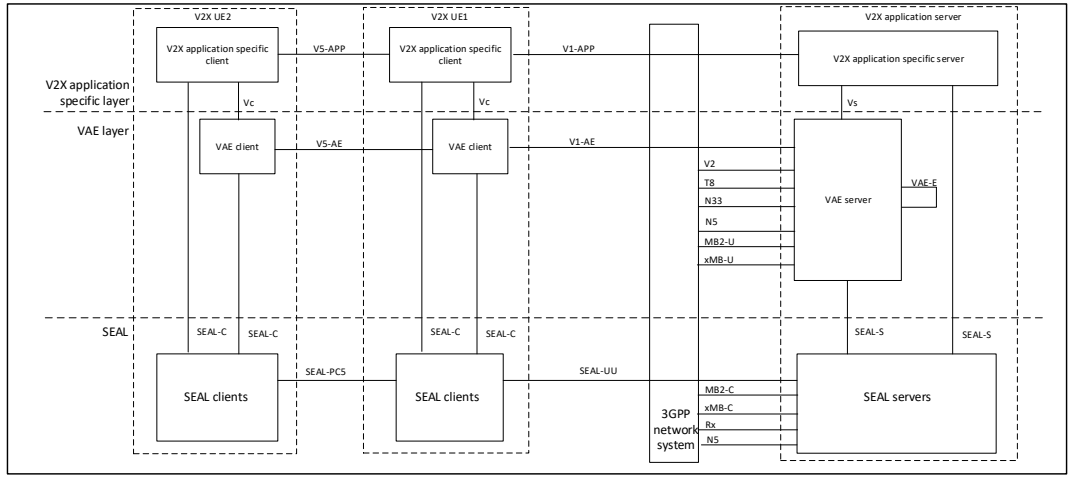
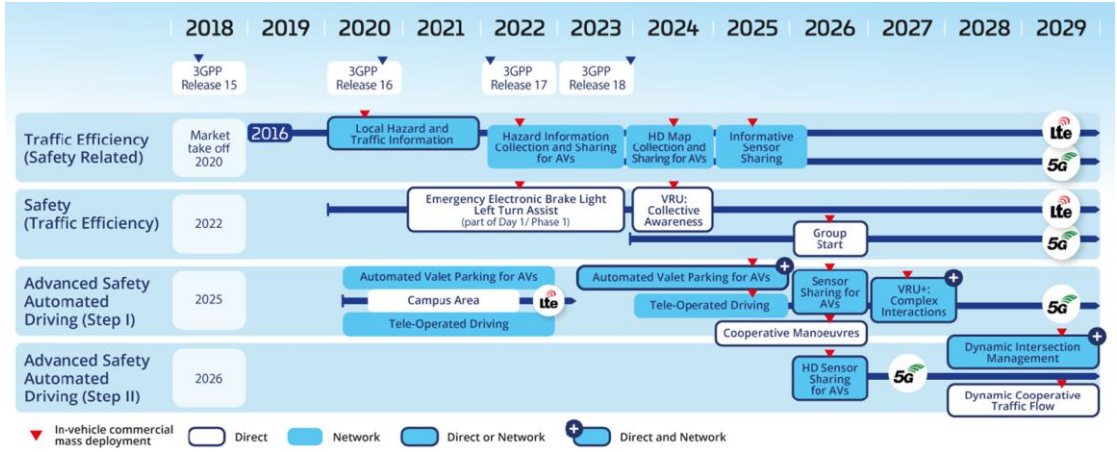
Other 5G benefits

A reference architecture now defined for 5G CCAM

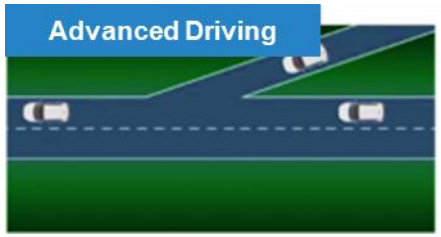
- TS 23.286 clearly defines functionnal architecture for V2X services in 3GPP reference architecture
  - ❖ Clarification of mecanisms both for Unicast communications on Uu interface and Broadcast ones in PC5
  - ❖ V2X Application Server architecture in MEC

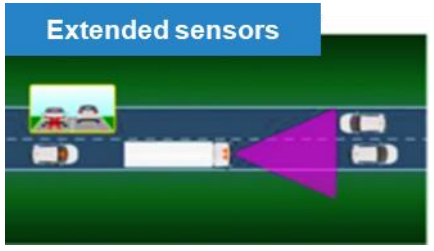


Clear Roadmap elaborated in 5GAA



Use Cases Design Patterns in TS 22.186





Drawbacks and remaining issues

5G Technology is still at early stage

- Rel15 is just an intermediate step and not so many Rel16 networks in place
- C-V2X chipsets for 5G not ready yet
- 5G-SA for millimeter-wave not yet defined in 3GPP

5G is a complete and complex Technology
Efficient settings very complicated to put in place both at Network side and UE side

- Fine tuning is needed between UE and Network to reach the performances announced for 5G
  - Positionning of the antenna in Network and with OBU
  - Design of Cells (especially with 5Gmm)
  - Beamforming parameters
  - Location of the P-GW

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Conclusion

5GAA and 3GPP have defined the foundations for 5G Technology to be a relevant enabler for CCAM

- Design Patterns for Use Cases
- Functionnal Architecture for V2X services
- Roadmap of services deployment in regards with 3GPP Releases

Even if the technology is at the early stage and not so simple to be deployed, it provides the key benefits to be effective and efficient for next generation C-ITS communications

- Low latency and High reliability are already effective and essential for automotive
- Key improvements to come with 5G-SA, URLLC and Direct Communications (PC5)

The scenarios deployed in 5G-Mobix French Site trials demonstrated this effectiveness for low latency, high throughput, high reliability and efficient adaptive QoS

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THANK YOU

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