Automotive Networks

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Some Questions (1)

Are the current protocols, architectures, design methods, and tools appropriate? What innovations are most urgently needed?

- There is a need for communication architectures that support *applications of different criticality* on the *same physical wire*, otherwise we are overwhelmed by wires.
- Fault-isolation must be better among differing distributed application subsystems (DASes) that reside on the same wire than what is achieved with CAN today.
- MPSoCs (*Multiprocessor systems on a chip*) will have an important influence on communication architectures.

Some Questions (1 ctd)

Are the current protocols, architectures, design methods, and tools appropriate? What innovations are most urgently needed?

- Higher band-width (more than 10 Megabit/second) will be needed for the following reasons:
  - Fusion of different *object recognition* methodologies
  - Voting on *the state* in triple-modular redundant TMR systems.
- Ethernet interoperability, *possibly Ethernet-based architectures*, will be considered.
- Safety concerns will get more important.

Some Questions (2)

Who shall develop the networks in the future, the OEM or a 1st tier supplier? What would be the consequence for the design process?

- The automotive industry will take better advantage of the existing information infrastructure--it will an *important contributor*, but also an *important user*.
- Protocols, communication systems and ICs will be developed by the *community at large*.

Some Questions (3)

Do we need interoperable network service standards, e.g. as a complement to AUTOSAR? Will there be a unified automotive "internet protocol" that eventually dominates all communication in a car?

- Interoperable network standards are dearly needed--they will be in the future of more importance than API standards.
- Composability of systems, taking existing components as basic building blocks, is a key requirement.
- Internet protocols will be used, but they will not dominate communication in the car, since internet protocols are non-deterministic.
- Security will become a *first-order citizen*.

Some Questions (4)

How will future car-to-car communication be included in the automotive network strategy if it shall be used for real-time applications, such as in driver assistance systems?

- Car-to-car communication will be an *integral part* of the automotive network strategy.
- Stronger cooperation with mobile phone technology is envisaged.

Conclusion

- The automotive networks will be interoperable with the general communication infrastructure, although they will maintain there own identity.
- Widely standardized communication protocols (e.g., Ethernet) will become more wide-spread in the automotive environment.
- Security will become a top-priority theme
- The influence of MPSoCs on the network architecture will be significant.