Ethernet could integrate automotive infotainment, study says

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(Note: This article originally appeared on EE Times Europe.)

After MOST and Firewire, Ethernet is emerging as a third option for in-car infotainment networks. A study reveals that Ethernet respectively IP (Internet Protocol) offers several benefits over its competitors.

The study, conducted by the Fraunhofer ESK research institute along with automotive system supplier Continental Automotive GmbH and engineering company M-Sys GmbH, comes to the conclusion that due to its inherent openness, the Ethernet /IP combination facilitates the integration of mobile devices such as cell phone or portable music players into the automotive environment.

The study also investigated options to integrate MOST and Ethernet networks. Towards this end, the researchers tested two migration scenarios for exchanging control information for audio equipment. One scenario focused on interworking between Universal Plug-and-Play Ethernet (UPnP/Ethernet) and MOST control data. The other scenario included real-time data tunneling as 'MOST over IP', aiming at the integration of audio devices in an Ethernet system.

Migration scenario with MOST and Ethernet/IP (Source: Fraunhofer ESK)

In addition to control information, the study examined the network component synchronization as well as the predictability of streaming data transmission times. To this end, the researchers compared Standard Ethernet/IP along with real-time protocols such as Real-Time Transport Protocol (RTP) and Precision Time Protocol (PTP) with Ethernet Audio Video Bridging (AVB). The results show that Ethernet AVB has the best potential for this type of applications. However, in contrast to Standard Ethernet/IP Ethernet AVB currently exhibits several shortcomings with regard to the industrial-level availability of some network components.

According to Fraunhofer ESK, both Ethernet variants tested are suited for automotive real-time infotainment applications. Since Ethernet AVB has not yet completely concluded the standardization process, the deployment of this variant will experience some delays.
In order to simplify future in-car networking infrastructures with combinations of MOST, FlexRay and Ethernet, it will be necessary to create a common communication level, the researchers say. “The current trends show that Ethernet will become more significant for the automotive industry,” the study concludes. In the long run, the researchers believe that Ethernet could even be used to implement safety-relevant communications functions within the car. Examples are the connections between sensors and driver assistance systems.

A Continental spokesperson acknowledged that the company considers to use Ethernet in cars to a larger extend. “Otherwise, we would not have joined the research project.” The purpose of the project was to bring Ethernet usage closer to serial production, he said.

At the same time the MOST Corporation increasingly positions its network technology for safety-relevant tasks. In its recent meeting, the MOST group pointed out that the latest MOST iteration, MOST150 is “almost ready to support such applications”.

A third contender for in-car infotainment networks is IEEE 1394, also known as Firewire. Proponents highlight the system’s versatility and security. However, the system has yet to find many supports in the automotive industry.