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The Controller Area Network

At the SAE (Society of Automotive Engineers) Congress 1986 in Detroit, Bosch presented the CAN protocol to be used for in-vehicle networking in passenger cars. Uwe Kiencke, Siegfried Dais and Martin Litschel introduced a new approach for an automotive high-speed serial communication link. Taking advantage of high transfer rates, very short latency time, object-oriented communication, acceptance filtering, powerful error detection mechanisms, and automatic error handling and confinement allows to introduce an additional overall optimization layer on top of separately located functions. Costs for CAN may be minimized by integrating it on-board of single-chip micro-controllers.

CAN is an abbreviation of the Controller Area Network and it is a serial communications protocol which efficiently supports distributed realtime control with a very high level of security. Its domain of application ranges from high speed networks to low cost multiplex wiring. In automotive electronics, engine control units, sensors, anti-skid-systems, etc. are connected using CAN with bitrates up to 1 Mbit/s. At the same time it is cost-effective to build electronics into vehicle body, e.g. lamp clusters, electric windows etc. which are difficult to be replaced in the case of failure. At the beginning   the CAN controller chips were stand-alone components. Intel launched the first CAN controller chip, namely the 82526, in the middle of 1987 that happened two months ahead of schedule. This idea came true in only four years. Shortly thereafter, Philips Semiconductors (today NXP) introduced the 82C200. These two earliest ancestors of the CAN controllers were quite different in terms of acceptance filtering and message handling. On the one hand, the FullCAN concept favored by Intel required less CPU load from the connected micro-controller than the BasicCAN implementation chosen by Philips. On the other hand, the FullCAN device was limited regarding the number of messages that could be received. Besides, the BasicCAN controller also required less silicon. Different options of acceptance filtering and message handling are implemented in CAN controllers of the same module thus making the misleading terms BasicCAN and FullCAN obsolete.

Nowadays, CAN is used in a broad field of applications. In total, more than two billions of CAN controllers have been sold. And the CAN markets are still growing and expanding. About 80% have been used for automotive applications; the others are widespread from industrial control via medical and maritime electronics to heavy-duty vehicles and other "machines on wheels". So as you can see CAN interface is time-proved system and it is getting popularity. That is why I could say that CAN was, is, and will be the dominating in-vehicle network in automobiles.