CAN *Newsletter Online*

AT THE TURN OF THE YEAR

Classical CAN, CAN FD, and CAN XL

The migration from Classical CAN to CAN FD is not finished yet. Nevertheless, the next CAN-based protocol is knocking at the door: CAN XL.

*The Neo e-cars are equipped with multiple CAN FD networks (Photo: Volkswagen)*

CAN FD is set for the next generation of passenger cars. Volkswagen will use multiple CAN FD networks in its new Golf platform as well as in the Neo e-cars – both to be launched in 2019. Even BMW migrates to CAN FD, although the German carmaker was not that enthusiastic, when the protocol was introduced in 2013. The truck industry is also adapting CAN FD: SAE develops the J1939-22 network and application layer and the related J1939-17 physical layer. SAE J1939-17 specifies 500 kbit/s in the arbitration phase and 2 Mbit/s in the data phase. Both specifications are intended to be released in 2019.

Non-automotive applications are also migrating to CAN FD. One of the preferred standardized higher-layer protocols, CANopen, has been updated already in 2017. Several protocol stack vendors have implemented the CiA 1301 application layer and communication profile (CANopen FD). At the SPS IPC Drives 2018 tradeshow, ESD, HMS, Microcontrol, and Emsa exhibited first CANopen FD I/O modules and host controllers.

Classical CAN is still the most used CAN data link layer protocol. According to the CiA user association about 2 billion CAN nodes have been installed in 2018. This will continue in the next couple of years. Step-by-step, Classical CAN in-vehicle networks will be substituted by CAN FD networks. In conservative markets such as construction machines, rail vehicles, maritime electronics, and elevators it will take some more time to migrate to CAN FD. The editors of the CAN Newsletter Online will keep you informed.

Knocking at the door

On Monday and Tuesday of this week, 35 engineers started discussing the features for the next generation of a CAN-based protocol. Initiated by Volkswagen, the experts evaluated the CAN data link layer providing extra large payloads of up to 2 KiB (2048 byte). Use cases include the connection of simple radars and eCall devices as well as TCO/IP communication. Of course, there are still some technical details to be decided, but the participants of the CiA SIG "Next generation CAN" made some progress in the inaugural two-day meeting. It was decided to support only 11-bit-priority IDs and to provide two CRC fields (one for the header and one for the frame).
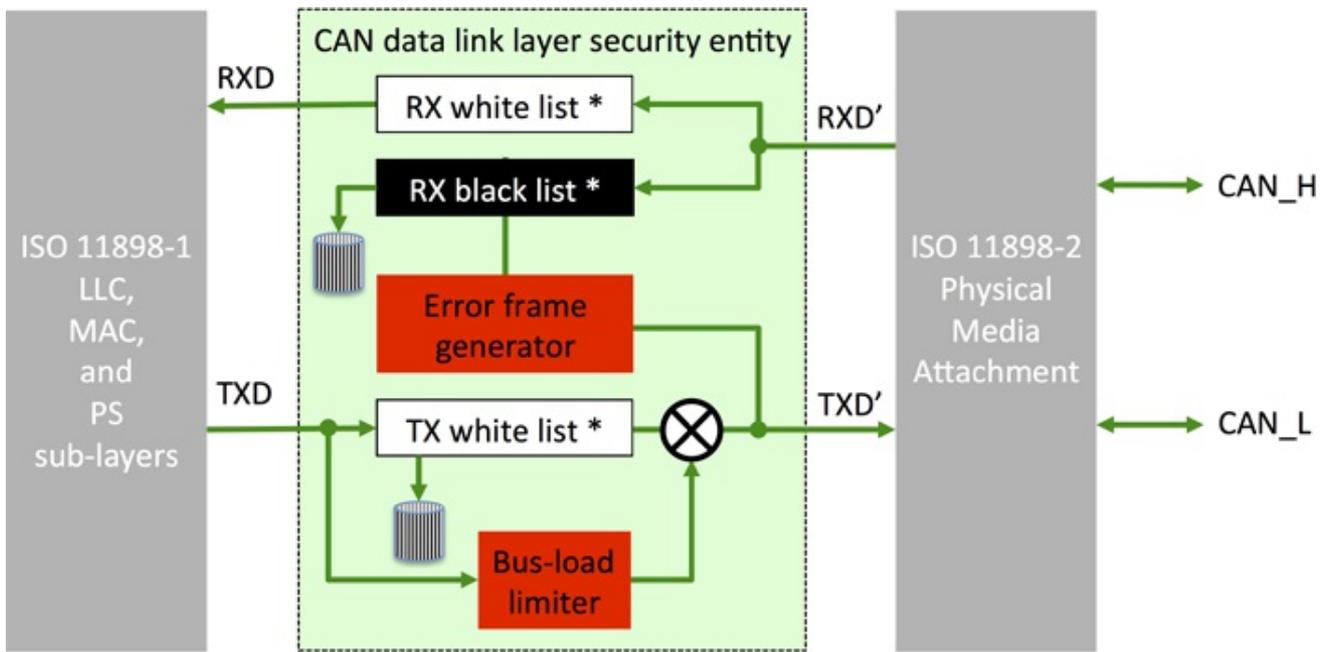
* Filtering dedicated CAN-IDs plus dedicated multiplexer values in the data field (e.g. for Autosar headers or CANopen USDO protocols)

Block diagram of the CAN data link layer security entity proposed by CiA (Photo: CiA)

Another hot topic in 2019 will be CAN cyber security. CiA plans to specify together with chipmakers some CAN data link layer measures. NXP has already announced a smart transceiver providing such measures. One of the features is sending of error frames, when other nodes send a data frame with an identifier, which is "owned" by this node.

Merry Christmas and a Happy New Year

We, the editors of the CAN Newsletter Online, tried to inform you about Classical CAN and CAN FD products and technology news. Of course, we will continue this also in 2019. We will also report about CAN XL and any other news related to CAN technologies. You should look also to the CAN Newsletter magazine, in which we publish technical in-depth articles and background features as well as application reports.

Our editor desks will be closed for two weeks. We will be back in the second week of 2019 hoping that you will visit our publications again. We wish you some peaceful days between the years in the circle of your family and friends.

Cindy Weissmueller, Nickel Plankermann, and Holger Zeltwanger