CAN FD Linux tools and driver infrastructure

At the opening day of the Embedded World 2014 a CAN FD plugfest connecting a Windows and a Linux system was presented. At the Peak-System booth, the different systems were connected using two PCAN-USB Pro FD adapters.

Configuration of a CAN FD controller with the 'ip' command from the latest 'iproute2' package (Linux screenshots: O. Hartkopp)

BASED ON THE CAN FD CAPABILITIES that were introduced in the Linux 3.6 CAN networking subsystem in Summer 2012, the CAN FD capable driver infrastructure will find its way into Linux 3.15. The donated PCAN-USB Pro FD adapter provides the full CAN FD functionalities, which enabled the Linux CAN community to discuss and implement the CAN FD extension for the unified Linux CAN driver infrastructure.

Configuration of a CAN FD controller with the 'ip' command from the latest 'iproute2' package (Linux screenshots: O. Hartkopp)

The CAN FD capability of the CAN controller is now exposed to the Linux system by the CAN driver, which enables additional CAN FD specific configuration options. These options allow to switch between classic CAN and CAN FD mode as well as the definition of the data bitrate (dbitrate) settings. The bitrate settings can be configured either by providing a single bitrate value (e.g. 1000000) or by a set of time quanta, segment value and jump width definitions.

At the booth the CAN FD adapters were spontaneously configured with 500 kbit/s for the arbitration bitrate and with 4000 kbit/s for the data bitrate, which led to an instant communication between the Windows and the Linux driven setup.

The existing Linux user-space tools to send, receive, store, and replay CAN traffic (aka 'can-utils') also confirmed their CAN FD capabilities in the interaction with the extended PCAN-View on Windows. The standard tool for Linux network configuration ('iproute2') will support the CAN FD specific options together with the release of the Linux 3.15 kernel and will automatically become part of common Linux distributions in the future.

Configuration of a CAN FD controller with the 'ip' command from the latest 'iproute2' package (Linux screenshots: O. Hartkopp)

With Linux 3.15, programming a CAN FD interface driver and using the CAN FD enabled network hardware becomes as easy as known from classic CAN interfaces. The 'can-utils' recently became an official Debian package for easy installation on Debian-based Linux distributions (Debian, Ubuntu, Linux Mint, etc.) with the existing software package managers. Alternatively the open source 'can-utils' can be downloaded from the Linux CAN community repository.