Open Vizsla

revision v3.2

3MDEB
ul. Burgaska 9D/10
80-287 Gdańsk, Poland
TAX ID: PL2530164147

CONTACT
Piotr Król, 3mdeb CEO
+48 880 673 344
contact@3mdeb.com

Website About Us

- Open hardware USB sniffer and analyzer in a decent prize
- Provides streaming out a textual representation of USB traffic to stdout
- Indispensable in debbuging USB devices
- Making a life easier

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Product description

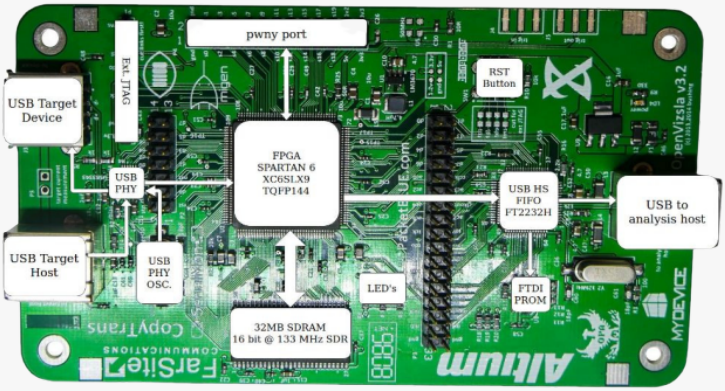
OpenVizsla is an open hardware USB 2.0 sniffer and analyzer that provides user ability to see all the data flow between a host and target device.

It allows the capture and inspection of USB traffic and helps with the reverse engineering and debugging of proprietary USB devices. It also can be a valuable tool for developers working with USB and especially those who are using USB in embedded designs.

Board design

OpenVizsla main components:

- Xilinx Spartan-6 FPGA
- Micron MT48LC16M16A2P-xx SDRAM (32MB)
- FTDI FT2232H High-Speed USB converter with FIFO interface
- SMSC USB3343 ULPI PHY Hi-Speed USB 2.0 transceiver



In the middle there is the FPGA. Connected directly to it is the USB PHY (ULPI), which is passively connected to the DP/DM lines between the Device-under-Test (DUT) USB-A and USB-B connector. The PHY can be put into a passive sniffing mode, after which the ULPI basically sends a stream with all received USB data to the FPGA, together with RXCMDs which are special status reports on out-of-band events like device detection.

The FPGA packetizes the stream, and buffers it in SDRAM. The stream is then sent back to the analysis host via the FT2232H FIFO bridge.

The Designers provides dedicated open source firmware, that is easy to use and verified.

Firmware building

Product features

OpenVizsla can passively capture USB2.0 traffic with low speed 1,5 Mbit/s (0,1875 MB/s), full speed 12 Mbit/s (1,5 MB/s) and high speed 480 Mbit/s (60 MB/s). The hardware design and the FPGA gateware are considered stable and reliable. Open source repository contains both the source code to the digital logic inside the on-board FPGA and the source code to the libusb-based host software.

The host software is quite basic and just gives you a textual / hex decode of the USB packets in near real-time. There is no GUI to visualize and represent the packets. There is no code to aggregate packets into transfers. There's no integration with other tools like sigrok, the virtual-usb-analyzer or wireshark, though we are working on it.

Examples of usage

As an USB2.0 sniffer OpenVizsla can be used in a validation of USB devices, compliance tests and benchmarking. Moreover, it can be used in security purposes, i.e. for catching encoded information between an USB device and a host.

Some additional examples can be viewed here.

Components

- Xilinx Spartan-6 FPGA
  - High pin-count to logic ratio for I/O connectivity
  - Over 40 I/O standards for simplified system design
  - PCI Express® with integrated endpoint block
  - Up to 8 low power 3.2Gb/s serial transceivers
  - 800Mb/s DDR3 with integrated memory controller
  - Zero power with hibernate power-down mode
- Micron MT48LC16M16A2P-xx SDRAM (32MB)
  - Data Rate PC133
  - Density 256Mb
- FTDI FT2232H High-Speed USB converter with FIFO interface
  - Dual independent UART or FIFO ports configurable using MPSSEs
  - Independent Baud rate generators
  - RS232/RS422/RS485 UART Transfer Data Rate up to 12Mbaud (RS232 Data Rate limited by external level shifter)
  - Fast Opto-Isolated serial interface option
  - FT245B-style FIFO interface option with bidirectional data bus and simple 4 wire handshake interface
- SMSC USB3343 ULPI PHY Hi-Speed USB 2.0 transceiver
  - Integrated VBUS over-voltage protection (up to +30V)
  - Integrated regulators allow single supply operation
  - ±8kV HBM with up to ±25kV IEC (contact/air)
  - USB-IF Battery Charger revision 1.2 support

Pricing

Information about a price and shipping terms can be found here:

https://shop.3mdeb.com/product/openvizsla/