

HelenOS USB

Software project
(supervisor M. Děcký)

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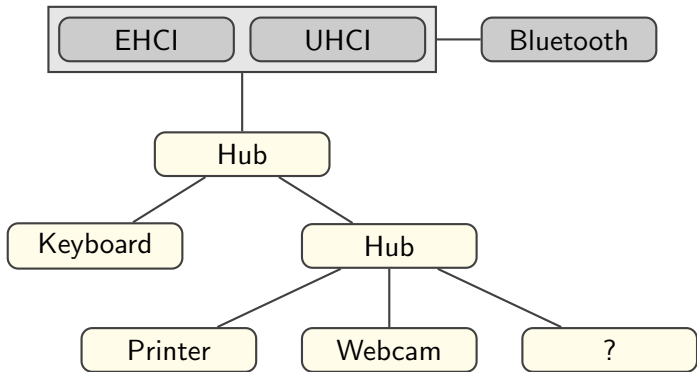
Project goals

- ▶ USB framework
- ▶ Host controller drivers
- ▶ HID driver

USB highlights

- ▶ Architecture for connecting peripherals
- ▶ Device discovery and configuration
- ▶ Hot plug & unplug, power management

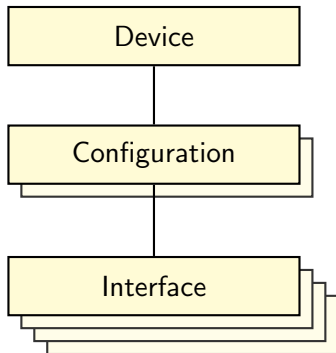
Physical topology



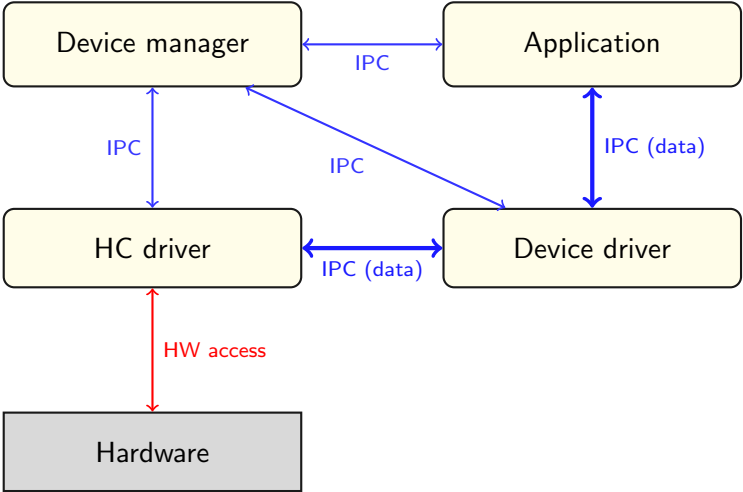
Host controllers – masters of the bus

- ▶ UHCI (USB 1.1)
- ▶ OHCI (USB 1.1)
- ▶ EHCI (USB 2.0)

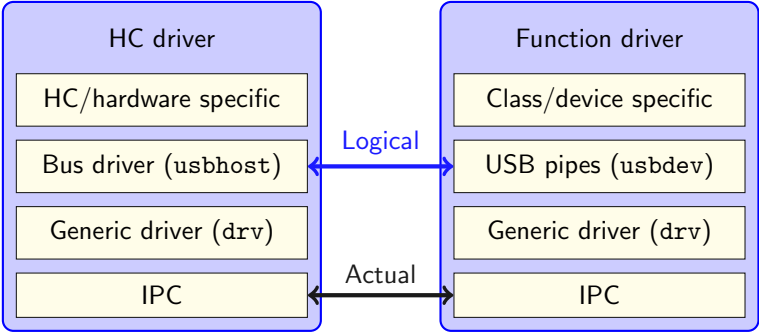
Devices – slaves of the bus



Drivers in HelenOS



Layered architecture



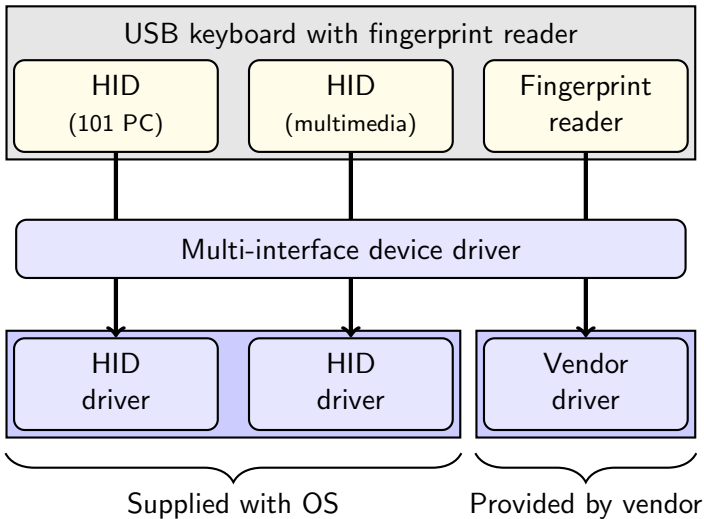
USB framework

- ▶ Communication API
- ▶ Wrappers for standard requests
- ▶ Generic data structures and functions

USB infrastructure drivers

- ▶ UHCI
- ▶ OHCI
- ▶ EHCI stub (hand off routine)
- ▶ Started for tested controllers only
- ▶ Hub

Multi interface devices



HID driver

- ▶ Keyboard
- ▶ Mouse
- ▶ Multimedia keys
- ▶ Interface for applications

Demonstration

(switch to another input, you ...)

Goal accomplishment

- ▶ USB framework ✓
- ▶ Host controller drivers ✓
- ▶ HID driver ✓
- ▶ Extra
 - ▶ EHCI stub
 - ▶ Mass storage device stub
 - ▶ lsusb and usbinfo utilities

Future work

- ▶ Support for multimedia devices
- ▶ Device unplug
- ▶ Power management
- ▶ More class drivers

Behind the scene...

- ▶ 5 member team
- ▶ Regular meetings every week
- ▶ Several collective coding weekends
- ▶ Trac & mailing list
 - ▶ Over 200 tickets
 - ▶ Links to many resources
- ▶ About 30K lines of code
 - ▶ excluding 12K lines with comments
- ▶ Already merged into *mainline*

Thank you.

Questions?

<http://helenos-usb.sourceforge.net/>

<http://www.helenos.org/>

<http://www.usb.org/>