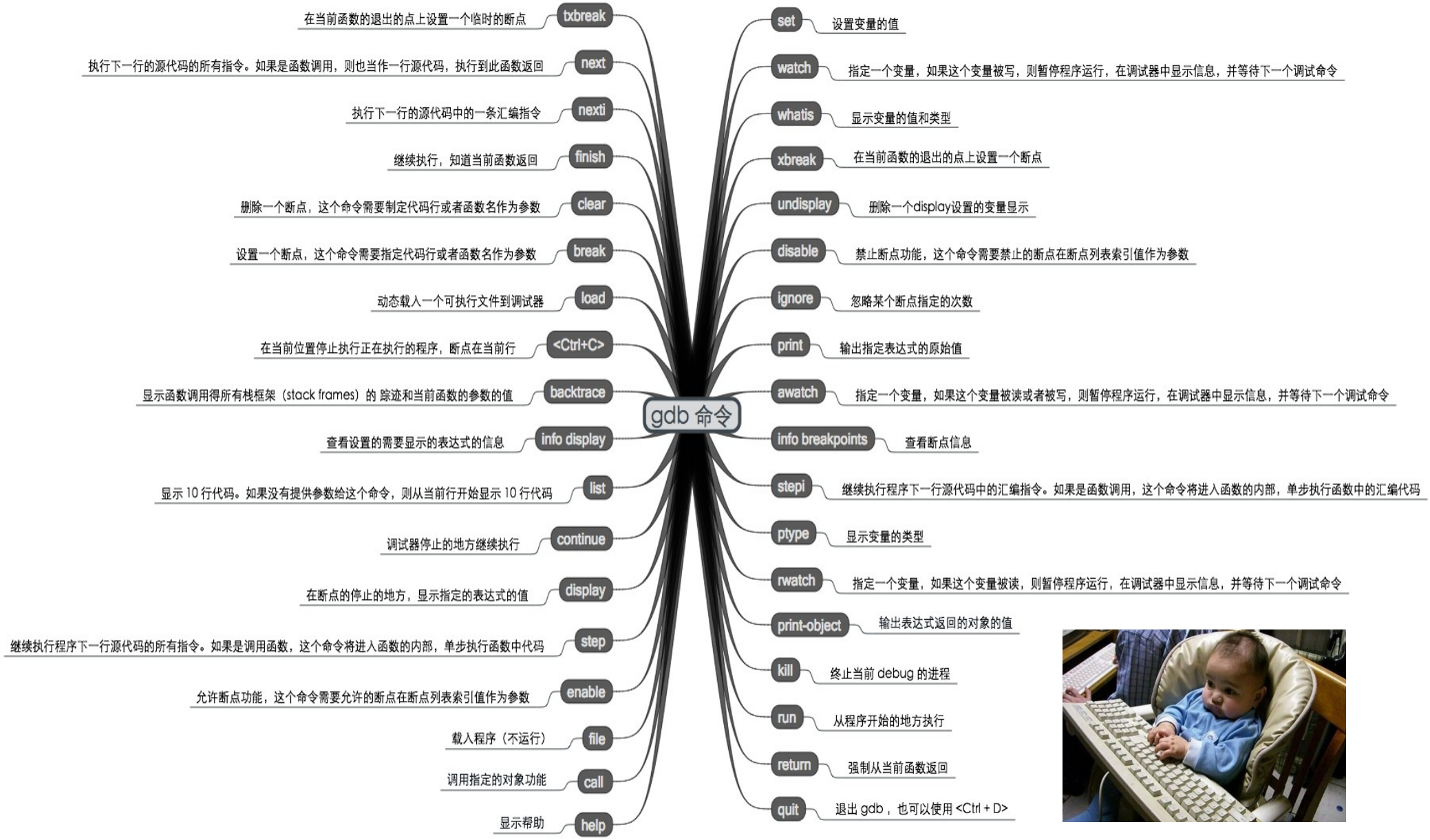
开源工具构建 ARM JTAG 调试环境

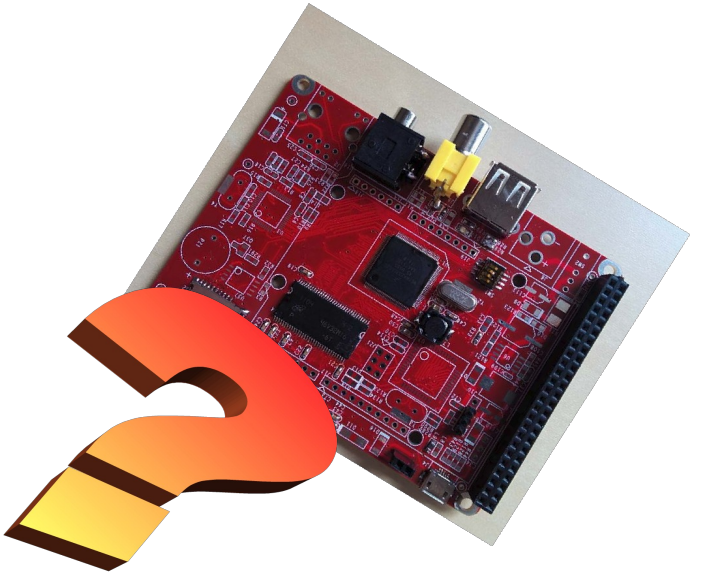
Orson Zhai
2014.9.13

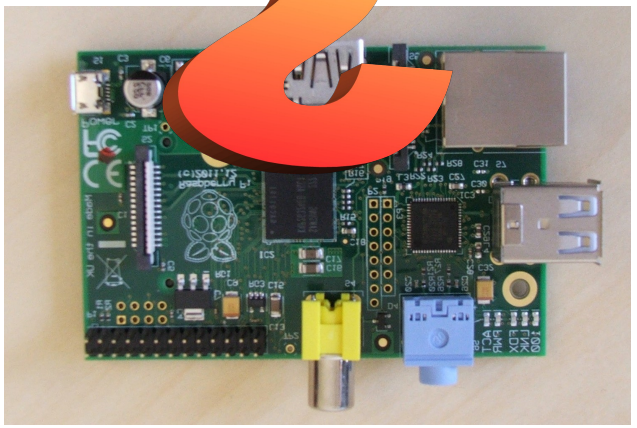
软件调试

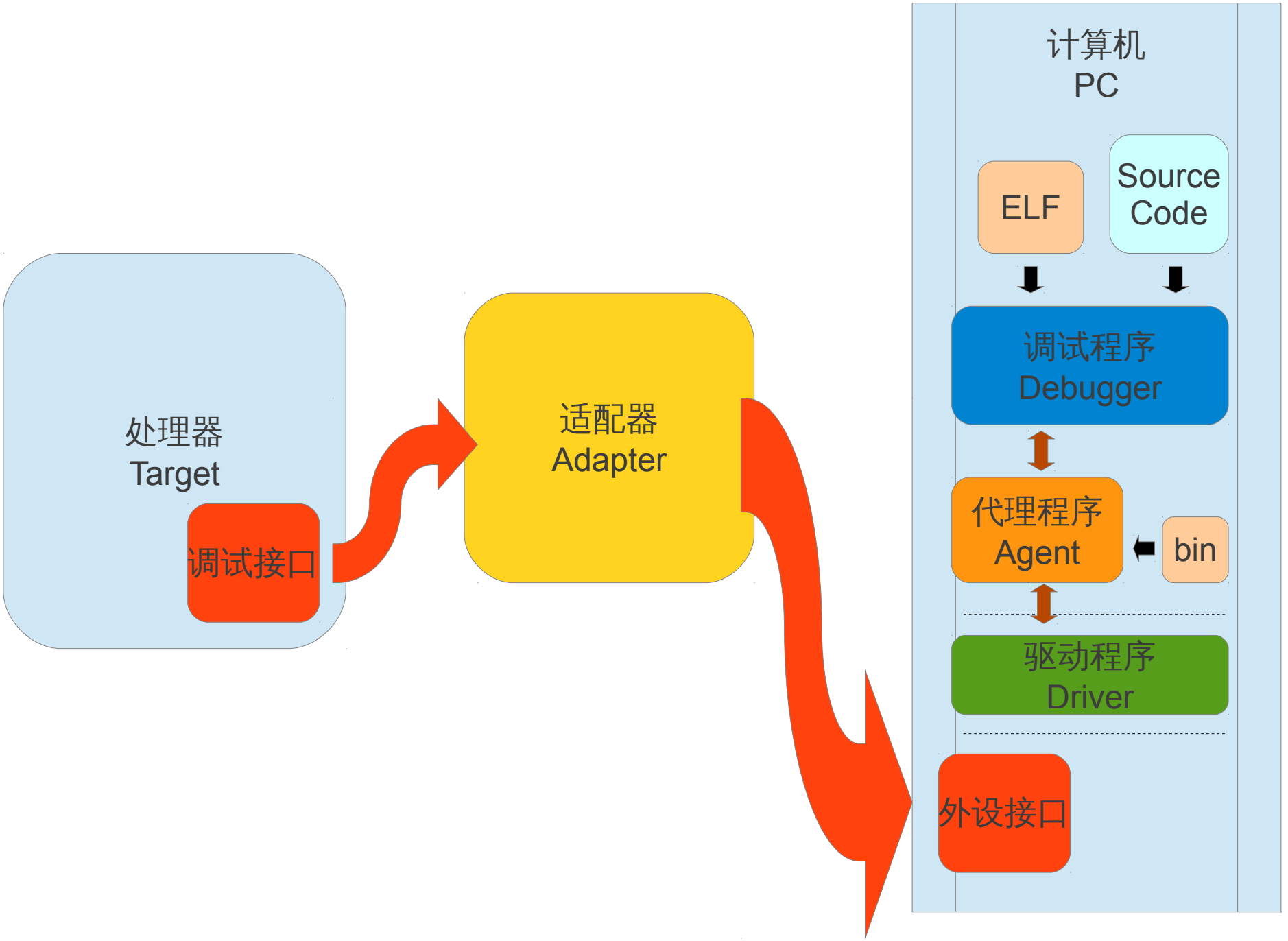


[1] http://www.vingel.com/tools/reference/gdb-commands-list.png

硬件调试



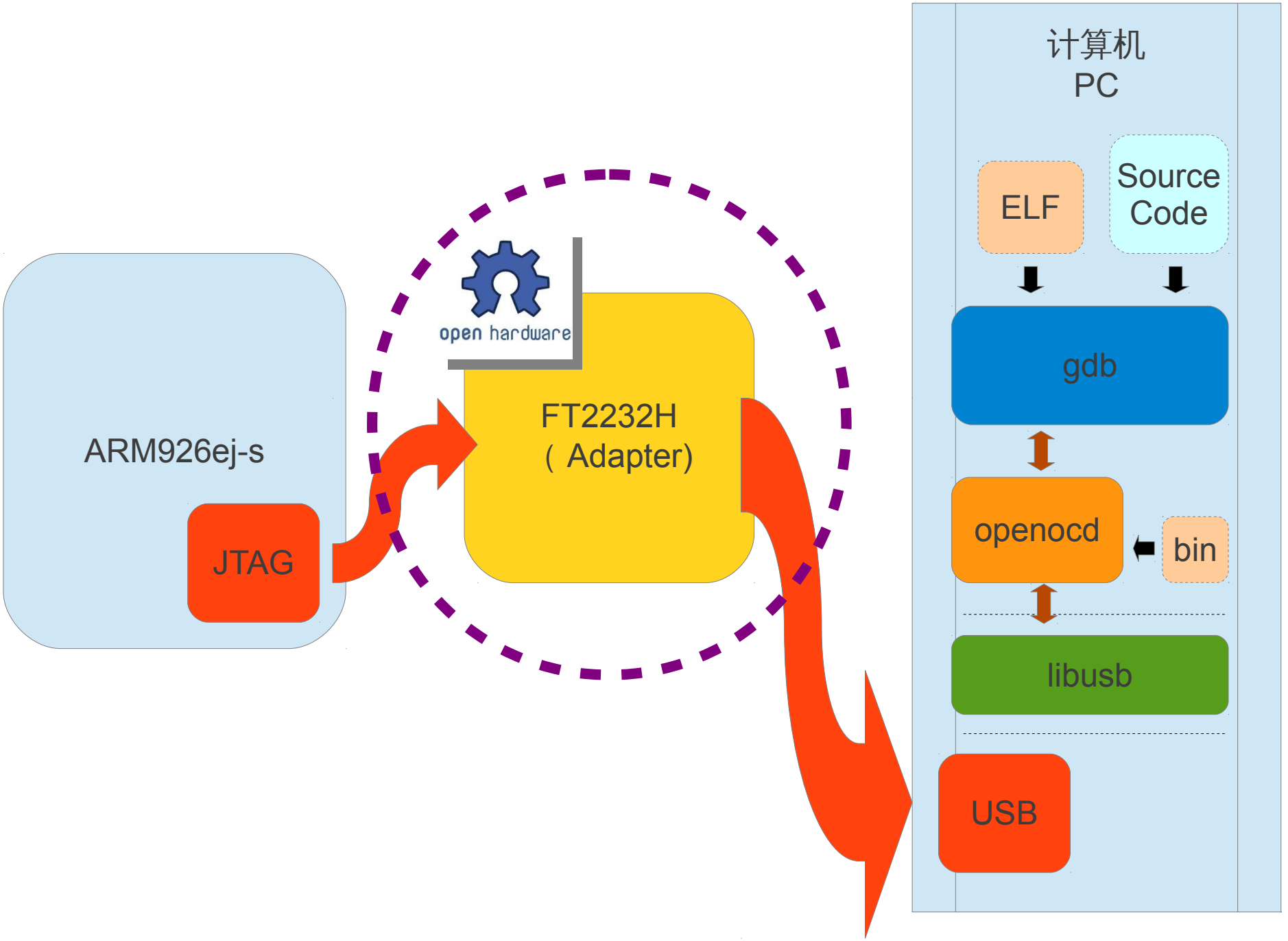


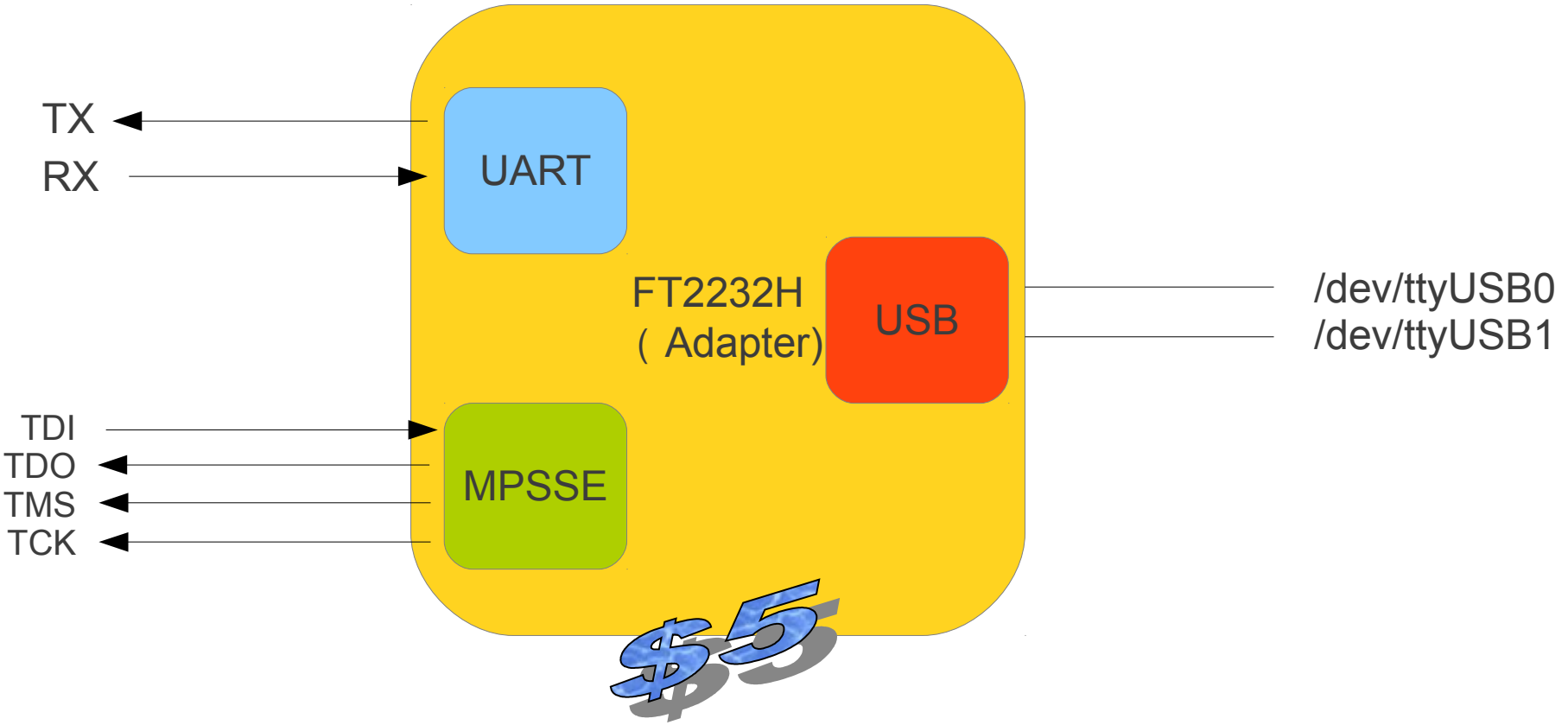

处理器
Target
调试接口
适配器
Adapter
计算机
PC
ELF
Source
Code
调试程序
Debugger
代理程序
Agent
bin
驱动程序
Driver
外设接口

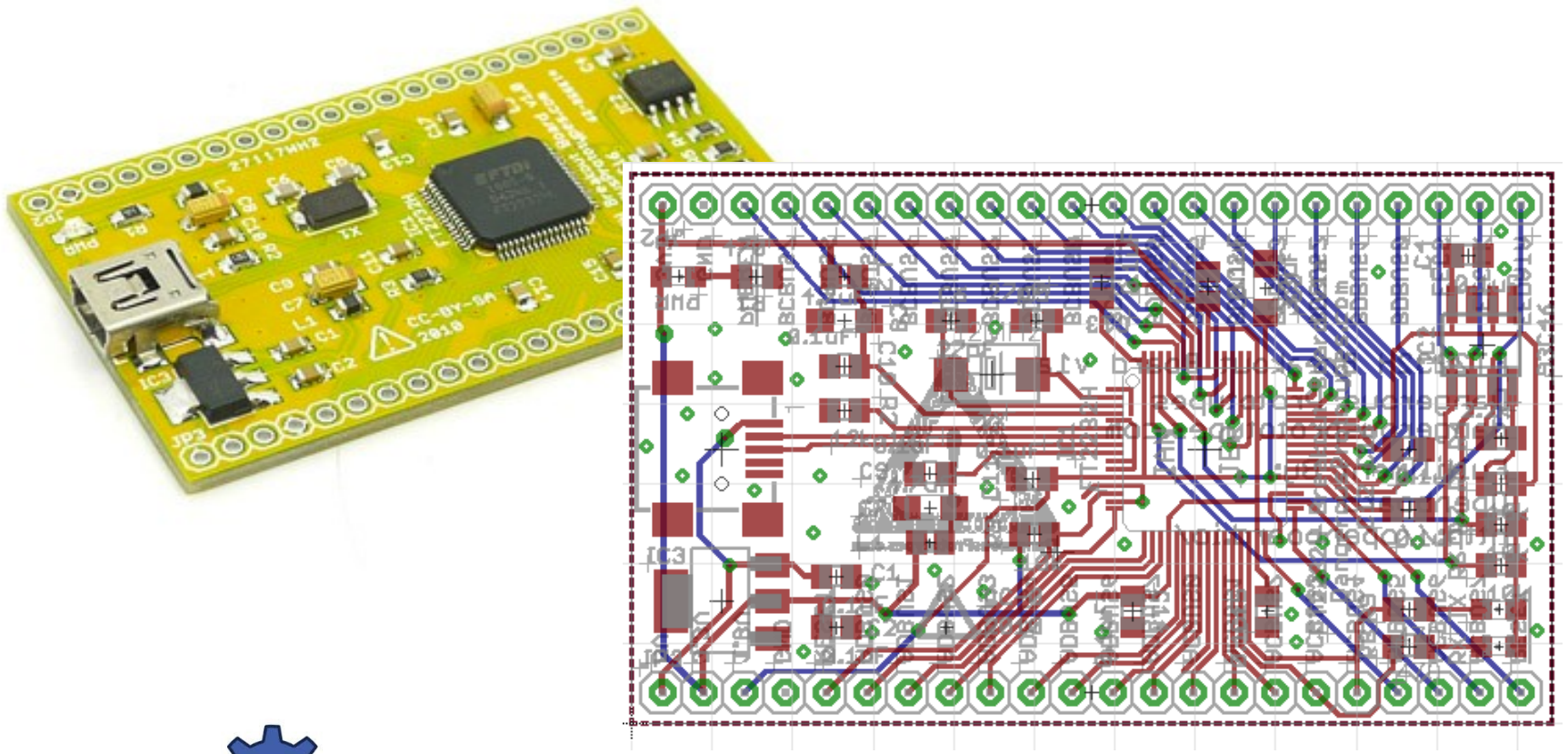
很久以来
硬调领域是开源荒漠
昵图网 www.nipic.com BY: 2581721921
NO:20111017140212143000

Cortex
CORTEX™-M1 FPGA
DEVELOPMENT KIT
ARM
RealView
DO NOT OBSTRUCT VENTS
RealView
ICE
J-Link
USB
SEGGER
JTAG
Development System
Getting Started
ULINK2
LAUTERBACH
群雄逐鹿

開源


计算机
PC
ELF
Source
Code
gdb
openocd
bin
libusb
USB
ARM926ej-s
JTAG
open hardware
FT2232H
(Adapter)


TX
RX
UART
FT2232H
(Adapter)
USB
/dev/ttyUSB0
/dev/ttyUSB1
TDI
TDO
TMS
TCK
MPSSE
$5



open hardware

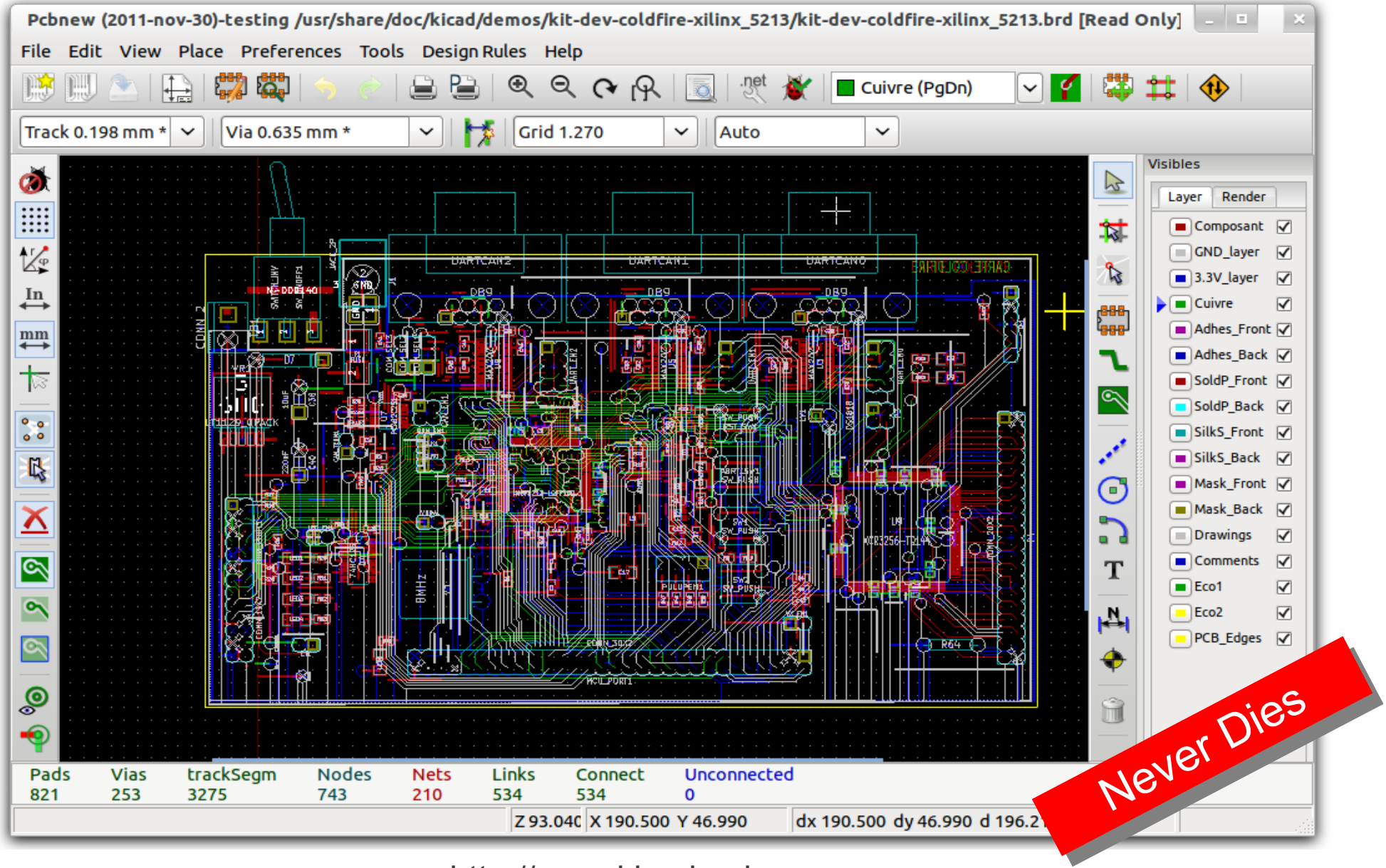
http://dangerousprototypes.com/docs/FT2232_breakout_board

svn checkout http://dangerous-prototypes-open-hardware.googlecode.com/svn/trunk/ dangerous-prototypes-open-hardware-read-only

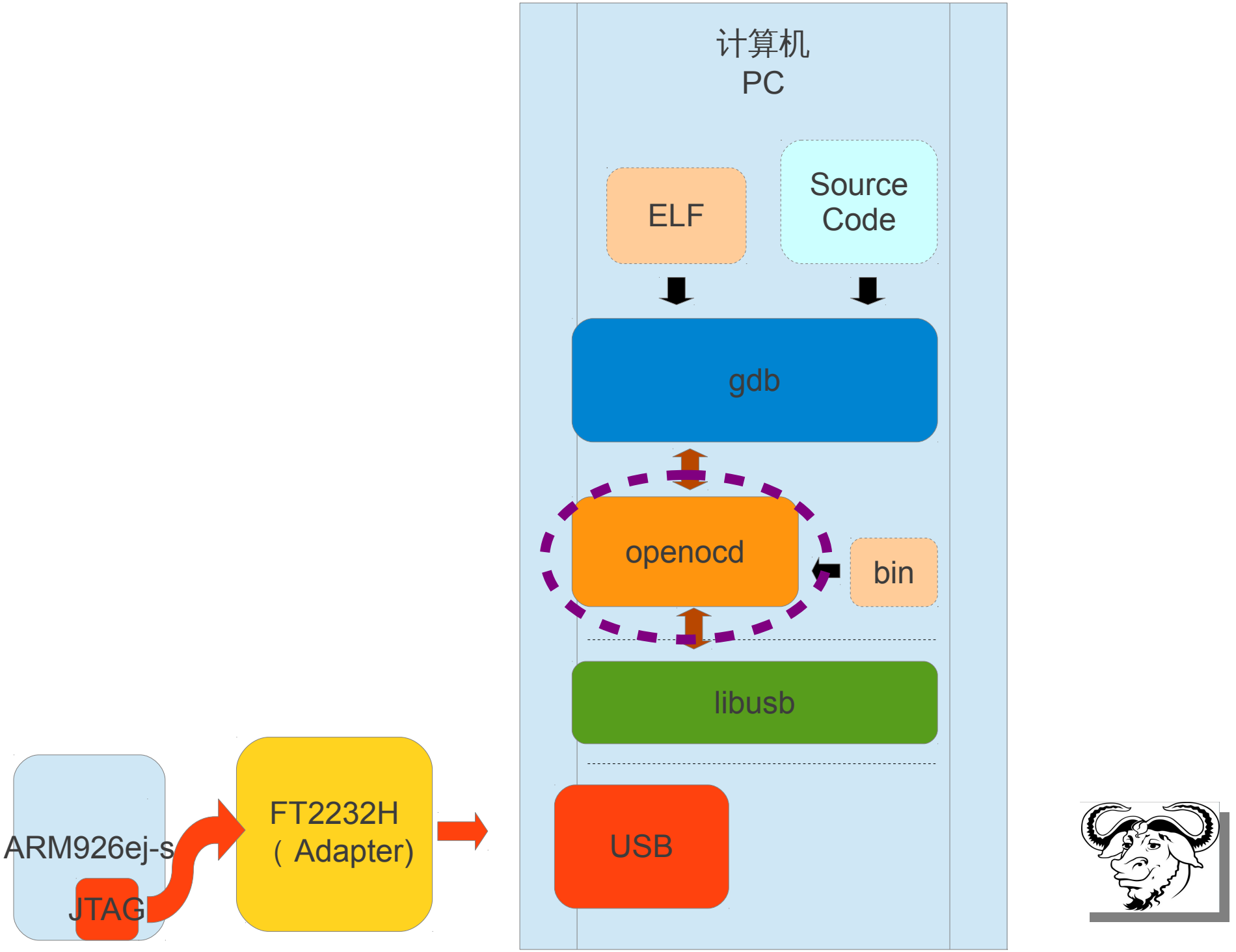
EDA 制板的 Vim

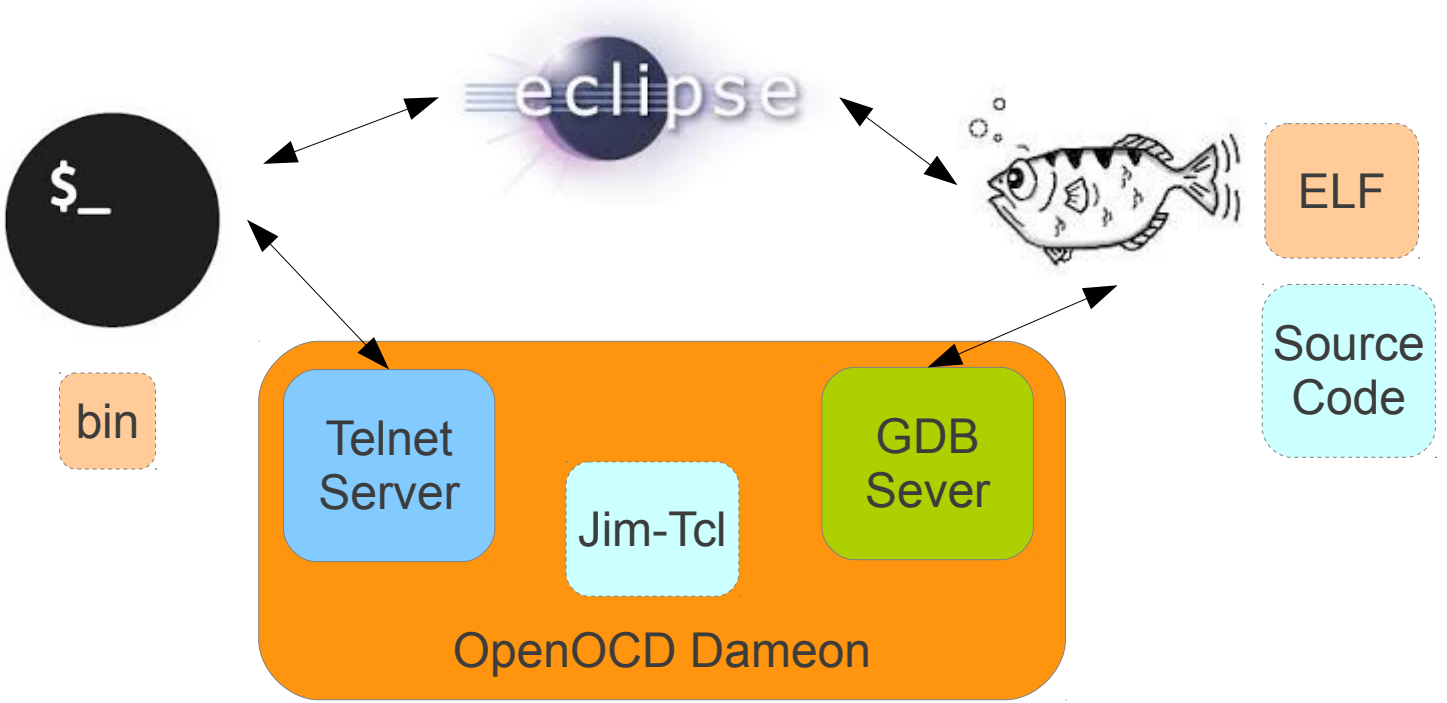
But NOT GPLed
CadSoft EAGLE
PCB Design Software V6
ONLY AVAILABLE THROUGH DIGITAL DOWNLOAD
FREE EMBROIDERED BADGE WITH EVERY ORDER!

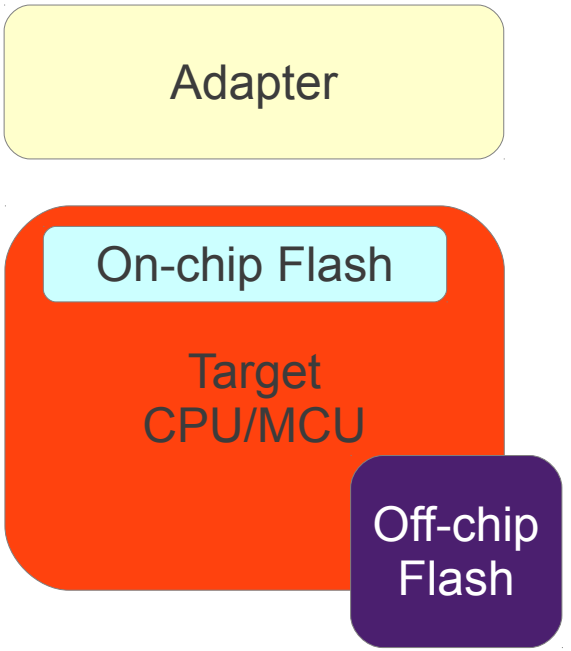
KiCAD EDA Software Suite



http://www.kicad-pcb.org


计算机
PC
ELF
Source
Code
gdb
openocd
bin
libusb
USB
ARM926ej-s
JTAG
FT2232H
(Adapter)


eclipse
$_
ELF
bin
Source Code
Telnet Server
Jim-Tcl
GDB Sever
OpenOCD Dameon


Adapter
On-chip Flash
Target CPU/MCU
Off-chip Flash

支持处理器类型 (Targets)

ARM11, ARM7, ARM9, AVR32, Cortex-A, Cortex-R, Cortex-M, Feroceon/Dragonite DSP563xx, DSP5680xx, FA526, MIPS EJTAG, NDS32, XScale, Intel Quark

http://openocd.sourceforge.net/

支持适配器类型 (Adapters)

AICE, ARM-JTAG-EW, ARM-USB-OCD, ARM-USB-TINY, AT91RM9200, axm0432, BCM2835, Bus Blaster, Buspirate, Chameleon, CMSIS-DAP, Cortino, DENX, Digilent JTAG-SMT2, DLC 5, DLP-USB1232H, embedded projects, eStick, FlashLINK, FlossJTAG, Flyswatter, Flyswatter2, Gateworks, Hoegl, ICDI, ICEBear, J-Link, JTAG VPI, JTAGkey, JTAGkey2, JTAG-lock-pick, KT-Link, Lisa/L, LPC1768-Stick, MiniModule, NGX, NXHX, OOCDLink, Opendous, OpenJTAG, Openmoko, OpenRD, OSBDM, Presto, Redbee, RLink, SheevaPlug devkit, Stellaris evkits, ST-LINK (SWO tracing supported), STM32-PerformanceStick, STR9-comStick, sysfsgpio, TUMPA, Turtelizer, ULINK, USB-A9260, USB-Blaster, USB-JTAG, USBprog, VPACLink, VSLLink, Wiggler, XDS100v2, Xverve

Jim-Tcl 命令脚本
高度可配置
文档页 100+

http://openocd.sourceforge.net/doc/pdf/openocd.pdf

安装 OpenOCD

git clone git://git.code.sf.net/p/openocd/code

```
# cd openocd-0.8.0
# ./configure
# make
# make install

# openocd -f interface.cfg -f board.cfg
```

连接 OpenOCD Console

```
orson@zhai:~$ telnet localhost 4444

Trying ::1...
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.

Open On-Chip Debugger
> help
```

GDB 连 OpenOCD

```
$ arm-none-eabi-gdb example.elf
(gdb) target remote localhost:3333
Remote debugging using localhost:3333
...
(gdb) monitor reset halt
...
(gdb) load
Loading section .vectors, size 0x100
...
Transfer rate: 22 KB/sec, 573
bytes/write.
(gdb) continue
Continuing.
...
```

Demo

- Target => Openboard Pegasus (http://github.com/openbrd/pegasus)
- Adaper => DP-FT2232H Break-out
- OS => Ubuntu 12.10
- Agent => Openocd 0.8.0
- GDB => arm-none-eabi-gdb v7.4
- Program => Niuboot (http://github.com/openbrd/niuboot)

作快乐“板农”，来开源社区！

网站： http://openboard.io/
论坛： bbs.openboard.io
邮件列表： openbrd@googlegroups.com
IRC: #openboard 房间 @irc.freenode.net
QQ 群： 262285750
Hacking-space:
北京上地八维校区 C4#201 房间

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