Melis3.x@v459

JLink 调试指导说明

1.0

2020.03.30

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1. JLink 调试指导说明

1.1 JLink 仿真器介

J-Link 是德国 SEGGER 公司推出基于 JTAG 的仿真器。简单地说，J-Link 是一个小型 USB 到 JTAG 协议转换盒。其连接到计算机用的是 USB 接口，而到目标板内部用的还是 jtag 协议。它完成了一个从软件到硬件转换的工作.

图 (Figure) 1

JLink 原理

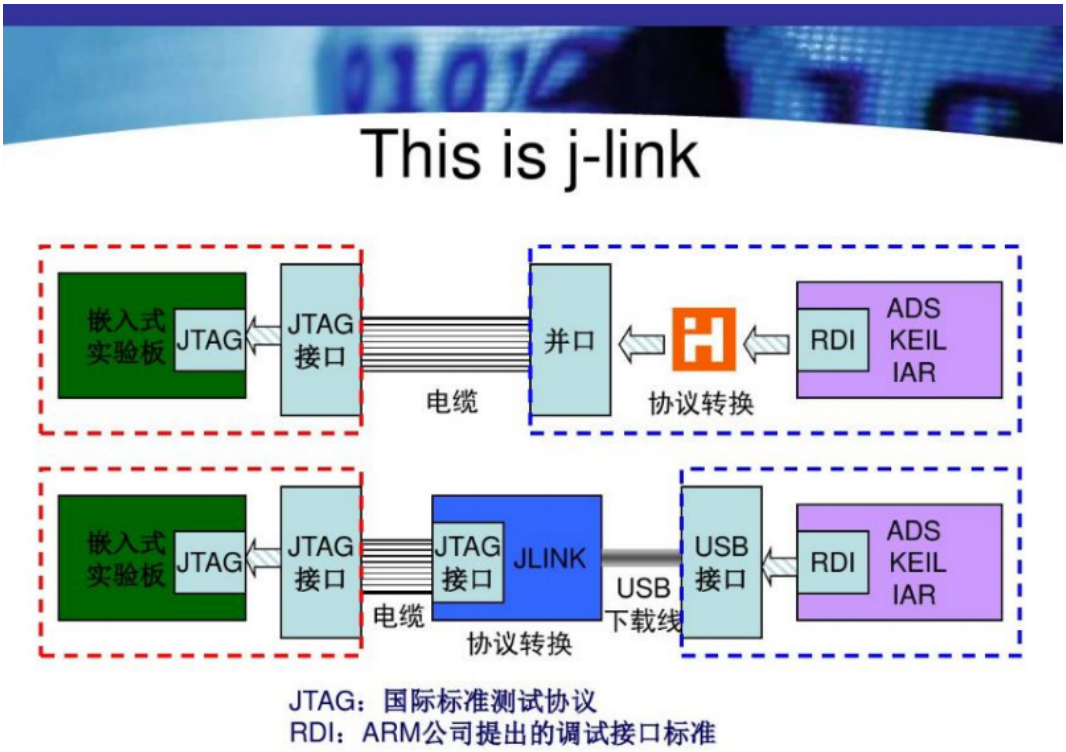

图 (Figure) 2

1.2 JLink 工作环境介绍

需要连接以下引脚

信号名	方向	作用
TCK	输入	为测试逻辑提供时钟
TDI	输入	接收测试指令和数据
TMS	输入	用于TAP控制器控制测试和操作
TDO	输出	串行输出到测试逻辑
GND	输入	地
nTRST	输入（可选）	用于TAP控制器的异步初始化

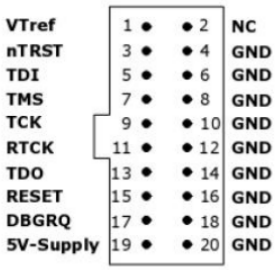

图 (Figure) 3

1.3 JLinkGDBServer 介绍

JLinkGDBServer 作用：

1. 解析 GDB 发送的 Remote Serial Protocol（RSP）协议命令

2. 输出 JLink 仿真器控制信号

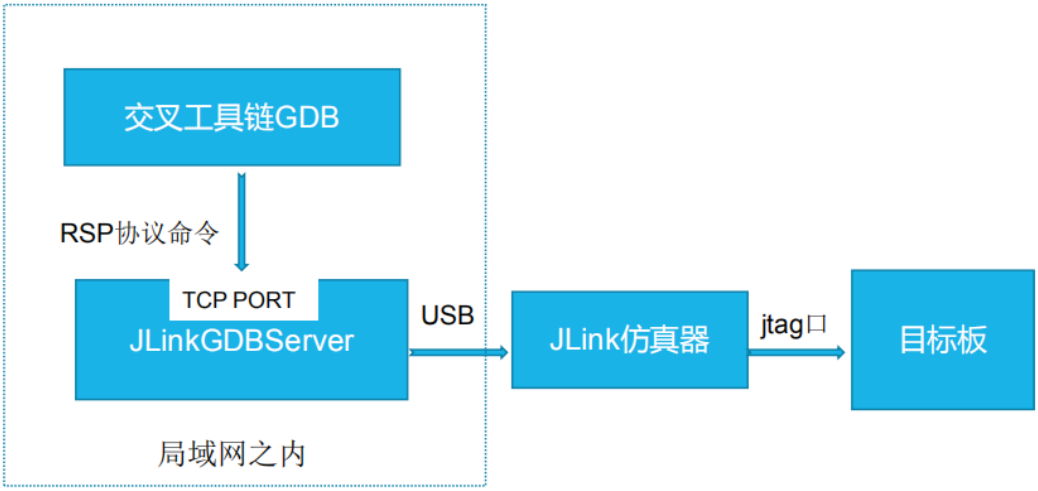

图 (Figure) 4

1.4 搭建 JLink 调试环境

1.4.1 step 1

前往 https://www.segger.com/downloads/jlink/JLink_Linux_x86_64.deb 下载 jlink for linux 的软件包，如在 ubantu 上使用，则下载 deb 软件包，然后使用 sudo dpkg -i JLink_Linux_V664b_x86_64.deb 命令来安装

1.4.2 step 2

在终端执行 JLinkGDBServer -device Cortex-A7 命令，启动 JLinkGDBServer 服务，等待 GDB 远程连接

```
wuhuating@PCwuhuating:~$ JLinkGDBServer -device Cortex-A7
SEGGER J-Link GDB Server V6.64b Command Line Version

JLinkARM.dll V6.64b (DLL compiled Mar 20 2020 10:08:28)

Command line: -device Cortex-A7
-----GDB Server start settings-----
GDBInit file:                    none
GDB Server Listening port:       2331
SWO raw output listening port:   2332
Terminal I/O port:               2333
Accept remote connection:        yes
Generate logfile:                off
Verify download:                 off
Init regs on start:              off
Silent mode:                     off
Single run mode:                 off
Target connection timeout:       0 ms
------J-Link related settings------
J-Link Host interface:           USB
J-Link script:                   none
J-Link settings file:            none
------Target related settings------
Target device:                   Cortex-A7
Target interface:                JTAG
Target interface speed:          4000kHz
Target endian:                   little

Connecting to J-Link...
J-Link is connected.
Firmware: J-Link V9 compiled Dec 13 2019 11:14:50
Hardware: V9.40
S/N: 59425868
Feature(s): RDI, GDB, FlashDL, FlashBP, JFlash, RDDI
Checking target voltage...
Target voltage: 3.31 V
Listening on TCP/IP port 2331
Connecting to target...

J-Link found 1 JTAG device, Total IRLen = 4
JTAG ID: 0x5BA00477 (Cortex-A7)
Connected to target
Waiting for GDB connection...
```

图 (Figure) 5

1.4.3 step3

另开一个终端，进入 melis 源码 source 目录下，执行 sudo /工具链绝对路径/arm-melis-eabi-gdb XXX.elf，将会加载指定的符号表，进入 gdb 命令行

1.4.4 step4

进入 gdb 命令行之后，执行 target remote 127.0.0.1:2331，则会顺利连接成功，即可进行远程调试目标板

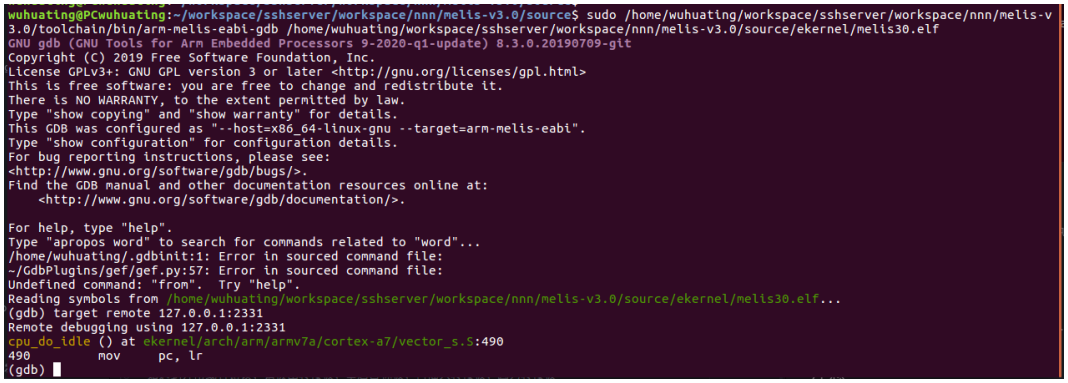

图 (Figure) 6

1.4.5 注意

如遇到异常或者错误，请拔出转接板，重启目标板，再插入转接板，因为转接板会供电

1.5 调试实例

1.5.1 设置断点

以在 rt_free 函数入口处设置断点为例，执行 b rt_free

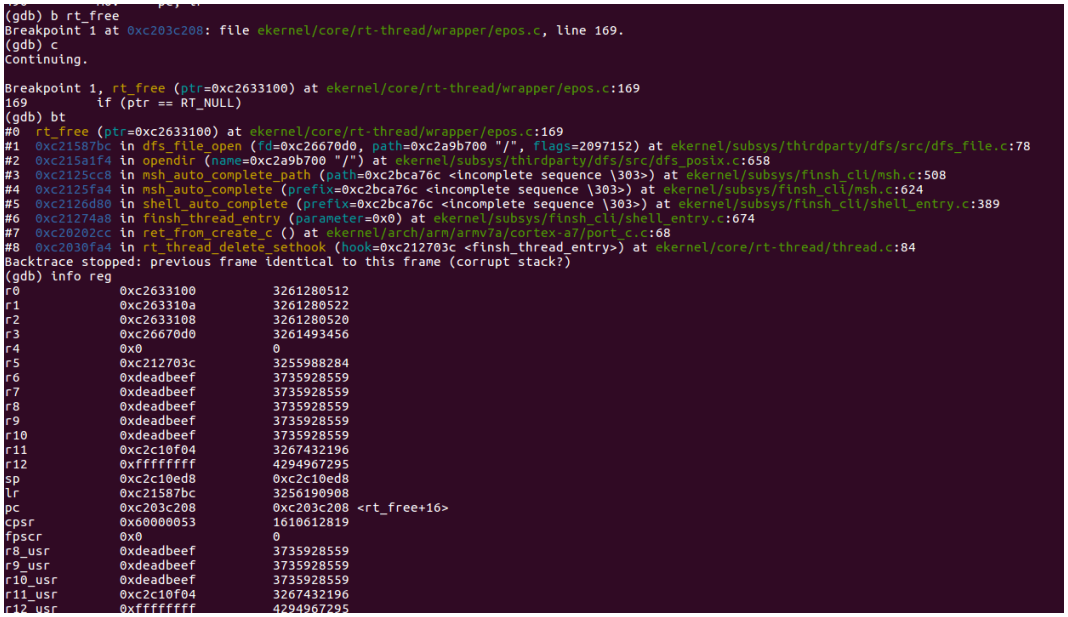

图 (Figure) 7

1.5.2 观察变量

进入断点后，可以观察变量或者结构体内容

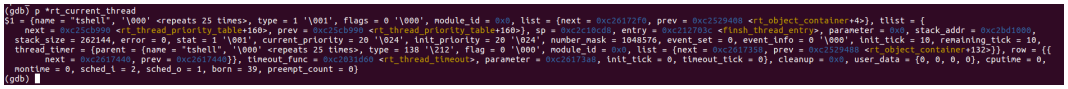

图 (Figure) 8

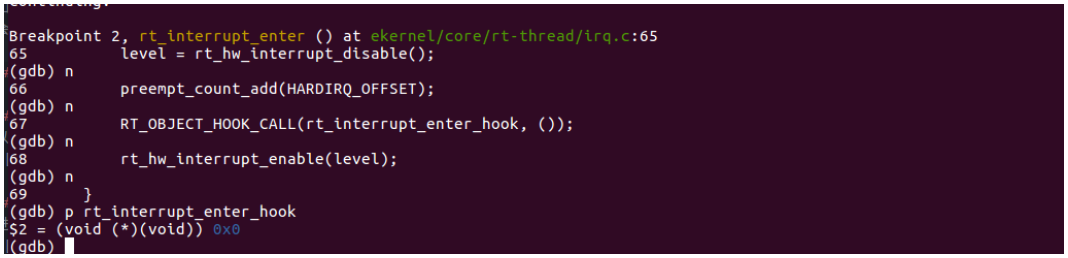

图 (Figure) 9

2. Declaration

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