

Using OpenOCD with TELNET connection

(a simple tutorial)

Motivation

Telnet connection to OpenOCD allows you to manually issue commands to target devices. Thus you can test basic connectivity with the target, write script files and debug those script files. Moreover, Telnet connection may also be used with OpenOCD to act as a programmer with the correct script commands to execute.

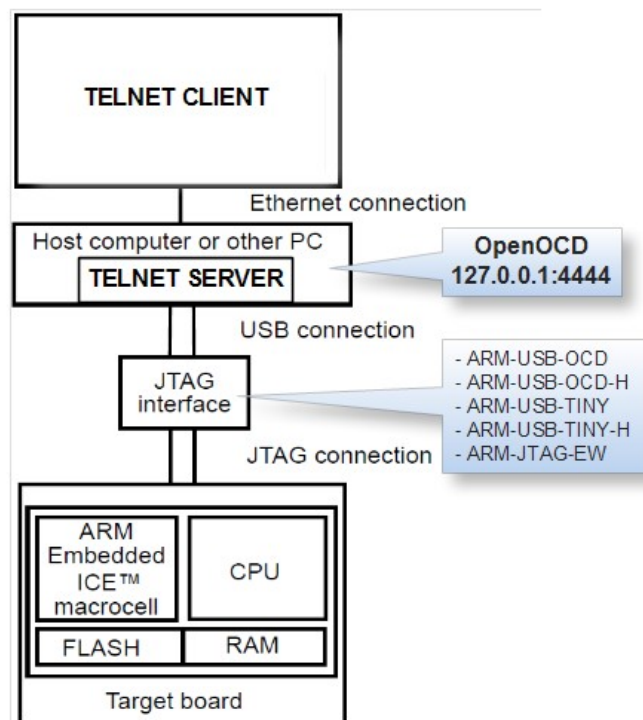
Installing Device Drivers

Please follow the instructions in **README.txt** file in the drivers folder included in the package. There is nothing specific about the installation process if you have installed Windows drivers before.

Connection between OpenOCD and TELNET Client

A very useful and rather universal terminal client is **PuTTY**. You can get it for free from thousands of places over the Internet and use it as a TELNET client. Another solution is to use the built-in TELNET client in Windows.

The TELNET client communicates with the GDB Server via an Ethernet connection, and the GDB Server communicates with the JTAG interface module over a USB connection. The JTAG interface module, in turn, communicates with the JTAG module on the hardware.



Connection between TELNET client and OpenOCD

*Note that OpenOCD accepts TELNET connections on port 4444 and **not** the default 23 port.*

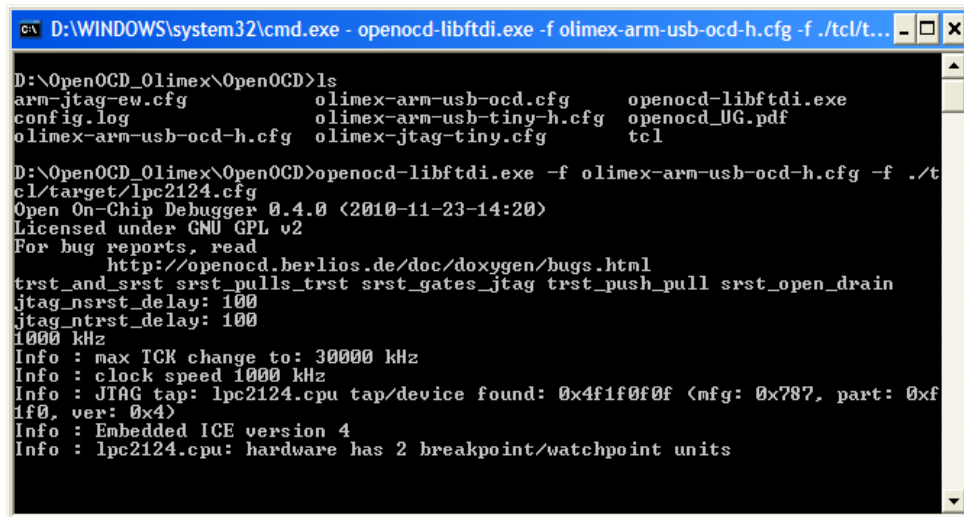
Configuring the OpenOCD Server

The server executable file is called: **openocd-libftdi.exe**. It is ready to run and needs no installation!

OpenOCD server needs a configuration file upon startup. The default is '**openocd.cnf**' so do not get upset if you start '**openocd-libftdi.exe**' and end up with an error message. A typical solution is to override the search for the configuration file and provide one or more configuration files with different names. For your convenience configuration files are divided into 2 types, one to configure the JTAG interface being used and another to configure the target processor. Interface configuration files for the supported JTAG adapters are placed inside the directory of OpenOCD executable. Sample target configuration scripts are located in the 'OpenOCD\tcl\target' directory.

Enough long explanations, to start the server open a console and navigate to 'OpenOCD' folder. If you are using ARM-OCD-H and a LPC2124 processor, for example, type:

```
> openocd-libftdi.exe -f olimex-arm-usb-ocd-h.cfg -f ./tcl/target/lpc2124.cfg
```



```
D:\OpenOCD_Olimex\OpenOCD>ls
arm-jtag-ew.cfg      olimex-arm-usb-ocd.cfg      openocd-libftdi.exe
config.log           olimex-arm-usb-tiny-h.cfg  openocd_UG.pdf
olimex-arm-usb-ocd-h.cfg  olimex-jtag-tiny.cfg      tcl

D:\OpenOCD_Olimex\OpenOCD>openocd-libftdi.exe -f olimex-arm-usb-ocd-h.cfg -f ./tcl/target/lpc2124.cfg
Open On-Chip Debugger 0.4.0 (2010-11-23-14:20)
Licensed under GNU GPL v2
For bug reports, read
http://openocd.berlios.de/doc/doxygen/bugs.html
trst_and_srst_pulls_trst srst_gates_jtag trst_push_pull srst_open_drain
jtag_nsrst_delay: 100
jtag_ntrst_delay: 100
1000 kHz
Info : max TCK change to: 30000 kHz
Info : clock speed 1000 kHz
Info : JTAG tap: lpc2124.cpu tap/device found: 0x4f1f0f0f (mfg: 0x787, part: 0xf1f0, ver: 0x4)
Info : Embedded ICE version 4
Info : lpc2124.cpu: hardware has 2 breakpoint/watchpoint units
```

Screenshot with OpenOCD server started.

The **-f** command explicitly provides a configuration file to the OpenOCD server. The first file tells OpenOCD that you will be using ARM-OCD-H JTAG adapter, and the second file describes the LPC2124 processor.

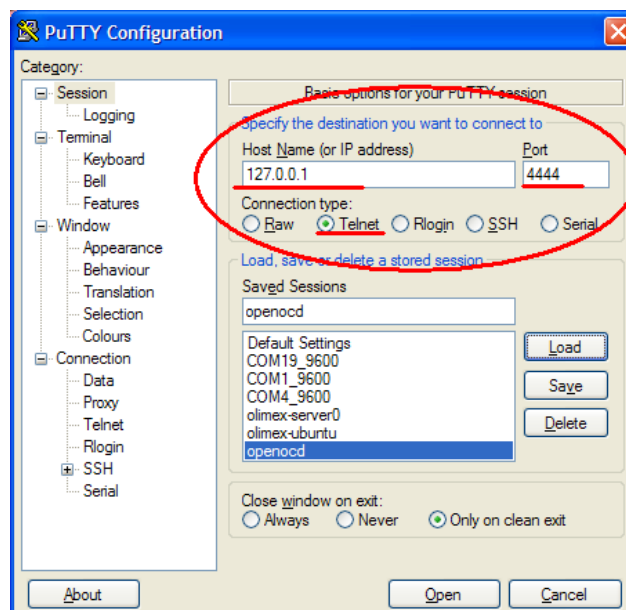
You will generally be more than unlucky to find no configuration file matching your target. Then you should write one using a file describing a platform closest to yours. Please consult OpenOCD user's guide for explanation of the various sections of such a file. Of course you will need the datasheet of the target device and some patience to try things until you set them right.

Connecting to OpenOCD

With OpenOCD running in a command prompt window you now need to start the TELNET client.

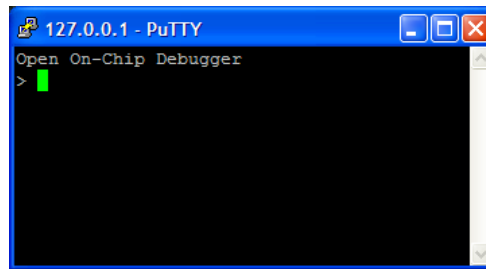
If using **PuTTY**:

Start **PuTTY**, select Telnet and enter the IP and port of OpenOCD. If using one machine for both the client and server enter the following: **IP: 127.0.0.1, Port:4444.**



PuTTY startup screen.

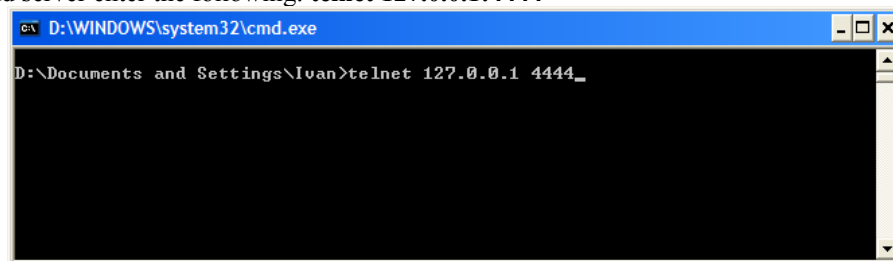
Press the **Open** button and you will connect.



Connected to OpenOCD

If using **Windows TELNET client**:

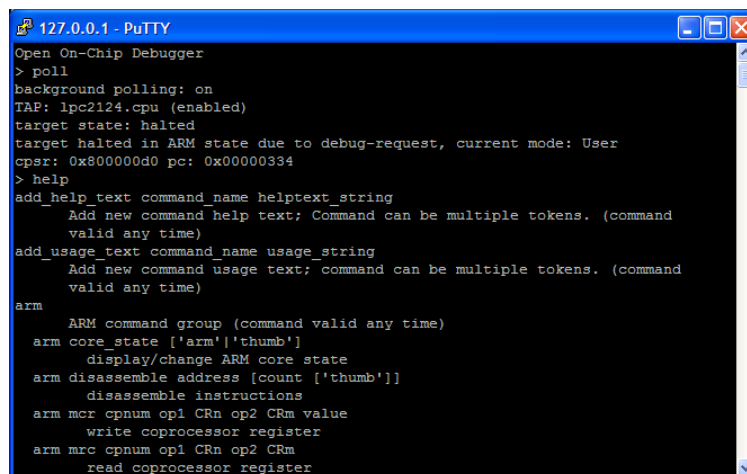
Start command prompt. Type '**telnet**' and enter the IP and port of OpenOCD. If using one machine for both the client and server enter the following: **telnet 127.0.0.1:4444**



Press Enter and you will connect.

Issuing commands

When connected you can now issue many commands to OpenOCD. Quick reference list may be displayed using a '**help**' command. For any details on the supported commands please consult the OpenOCD user's guide.



Working with OpenOCD

Conclusion

Please note that OpenOCD is sometimes pretty tricky to work with so be aware of configuration and runtime issues. Well, if things get very ugly you should stop the server, reconnect the JTAG adapter and start over.

If in need of more information check out any of the following:

- <http://openocd.berlios.de/web/> - the official web page of the OpenOCD project.
- <http://www.iar.com/> - home of the IAR development tools.
- <http://www.olimex/dev/> - manufacturer of development boards and tools. That's us :).

THE END