Open On-Chip Debugger (OpenOCD) Release Notes

TEXAS INSTRUMENTS

Texas Instruments Release 1.1.

Release 1.1 of OpenOCD for SimpleLink™ Connected MCUs is now available in this package. This release extends the capability of OpenOCD version 0.10.0 by providing support for select MCU devices and the XDS110 debug probe.

Documentation for OpenOCD is provided as a .PDF file, openocd.pdf, located in the root directory of this package. These release notes detail the additional support added to OpenOCD.

Overview

- Package includes the following directories and files:
    - openocd -- Full OpenOCD 0.10.0 with added support for MCU devices.
    - openocd.pdf -- Complete OpenOCD documentation.
- Adds MSP432P4, MSP432E4, CC32xx, CC3220SF, CC13xx, and CC26xx devices to OpenOCD.
- Supports flash programming on all MSP432P4 and MSP432E4 devices.
- Supports flash programming for CC3220SF internal flash.
- Supports flash programming on CC13xx and CC26xx devices.
- Adds XDS110 debug probe (both embedded and stand-alone) to OpenOCD.
- Supports LaunchPads with embedded XDS110 debug probes.

Supported Boards

Board / Family	Config File
MSP432P4 and MSP432E4 LaunchPads	board/ti_msp432_launchpad.cfg
CC3200 and CC3220 LaunchPads	board/ti_cc32xx_launchpad.cfg
CC3220SF LaunchPads (with internal flash)	board/ti_cc3220sf_launchpad.cfg
CC13x0 LaunchPads	board/ti_cc13x0_launchpad.cfg
CC26x0 LaunchPads	board/ti_cc26x0_launchpad.cfg
CC13x2 LaunchPads	board/ti_cc13x2_launchpad.cfg
CC26x2 LaunchPads	board/ti_cc26x2_launchpad.cfg

Supported Targets

Target / Device	Config File
MSP432P4 and MSP432E4	target/ti_msp432.cfg
CC3200 and CC3220	target/ti_cc32xx.cfg
CC3220SF (with internal flash)	target/ti_cc3220sf.cfg
CC13x0	target/ti_cc13x0.cfg
CC26x0	target/ti_cc26x0.cfg
CC13x2	target/ti_cc13x2.cfg
CC26x2	target/ti_cc26x2.cfg

Supported Interfaces

Interface / Debug Probe	Config File
XDS110 (both embedded and stand-alone)	interface/xds110.cfg

System Requirements

OpenOCD requires a *nix environment to build. Linux and Mac OSX can build OpenOCD natively. Refer to the README and README.OSX files in the openocd directory for specific instructions and requirements.

On Windows, OpenOCD requires either Cygwin or MinGW-w64/SYS to be installed. Refer to the README.Windows file in the openocd directory for specific instructions and requirements.

This package was tested and validated on the following platforms:

- Windows 7 64-bit running 32-bit Cygwin
- Windows 7 64-bit running 64-bit Cygwin
- Ubuntu 16.04 LTS 64-bit
- macOS High Sierra 10.13.1

How to Build and Install

Download or clone the OpenOCD repository at http://git.ti.com/sdo-emu/openocd. The latest release available is located on the master branch of the repository.

Once you've acquired a copy of the OpenOCD files, build and install OpenOCD using the following commands (Linux, Mac OS, or Cygwin):

```
./configure
make

sudo make install
```

(Note that `sudo` isn't necessary when building on Cygwin.)

If you encounter build errors, then run the following command and start the build again:

```
autoreconf --force --install
```

The INSTALL file inside the openocd directory includes further instructions on what may be needed on your system for OpenOCD to build.

Usage

Launch OpenOCD as follows (using MSP432 Launchpad as an example):

```
openocd -f board/ti_msp432_launchpad.cfg
```

Connect to the OpenOCD server with either telnet or gdb:

From telnet: `telnet localhost 4444`

From gdb: `target extended-remote localhost:3333`

OpenOCD commands can be issued directly from the telnet session or via gdb's `monitor` command. Further instructions on debugging with OpenOCD can be found in the OpenOCD documentation.

XDS110 Support

Installers for support utilities and firmware for the XDS110 debug probe are available from the links below. Choose and install the appropriate installer for your system's OS. Registration will be required on the site to download the installer. Documentation on how to use the utilities to upgrade the XDS110 is included in the installation.

Windows: ti_xds110_setup_7.0.100.1_windows.exe
Linux (32-bit): ti_xds110_setup_7.0.100.1_linux_i386.bin
Linux (64-bit): ti_xds110_setup_7.0.100.1_linux_x86_64.bin
Max OSX: ti_xds110_setup_7.0.100.1_osx_x86_64.app.zip

The Windows installer also installs the Windows drivers needed to program and use the XDS110 debug probe.

The Linux installers also include a rules file for udev to enable user level access to the XDS110 debug probe.

Limitations

- Serial flash on CC3200 and CC3220 is not supported by this package. Internal flash on CC3220SF is protected by security code and may be erased when the device is reset. For details, see Section 21.10 "Debugging Flash User Application Using JTAG" of the CC3220 TRM: http://www.ti.com/lit/pdf/swru465.
- OpenOCD does not support cJTAG 2-pin modes used by CC13xx and CC26xx devices. If an application running on the device reconfigures the TDO and TDI pins, debugging will not be possible using OpenOCD.
- Mass erase is not supported on CC13xx and CC26xx devices.
- The `verify` option for the `program` command may take a long time to complete on some devices.
- XDS110 connection may not be reliable when running on a virtual machine such as VirtualBox.

Release History

- **Release 1.1**
  - Maintenance release to address issues found in 1.0.
  - Based on OpenOCD 0.10.0.
  - Resolved issues with reset handling for CC13xx and CC26xx devices.
  - Resolved issues with the `program` command for CC13xx and CC26xx devices.
  - Resolved `reset run` issue for CC32xx devices (core would not start).
  - Resolved `flash info` crash on Cygwin 64-bit for MSP432.
  - Resolved gdb crash when erasing flash on CC13xx and CC26xx devices.
  - Added support for stand-alone XDS110 Pod.

- **Release 1.0**
  - Initial public release.
  - Based on OpenOCD 0.10.0.
  - Added MSP432P4, MSP432E4, CC32xx, CC3220SF.
  - Added CC13x0 and CC26x0 as beta.
  - Added XDS110.