Open On-Chip Debugger (OpenOCD) Release Notes

TEXAS INSTRUMENTS

Texas Instruments Release 1.0.

Release 1.0 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.
  - xds110 -- Drivers, firmware, and utilities for the XDS110 debug probe.
- Adds MSP432P4, MSP432E4, CC32xx, and CC3220SF to OpenOCD.
- Adds CC13x0 and CC26x0 (beta with limited support) to OpenOCD.
- Supports flash programming on all MSP432P4 and MSP432E4 devices.
- Supports flash programming for CC3220SF internal flash.
- Supports flash programming on CC13x0 and CC26x0 devices.
- Adds XDS110 debug probe 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

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

Supported Interfaces

Interface / Debug Probe	Config File
XDS110	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 Sierra 10.12.6

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 included in the xds110 directory. Install the appropriate installer for your system's OS. Documentation on how to use the utilities to upgrade the XDS110 is included in the installation.

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

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

These utilities and firmware are also included with Code Composer Studio.

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. Refer to documentation for the CC3220SF to learn how to set the security options.
- CC13x0 and CC26x0 support has been provided as a beta release with the following known issues:
    - The `reset` command will disconnect debug; use `reset halt` instead.
    - Board reset (via nSRST pin) is not yet supported.
    - Low power applications (that put CPU into sleep modes) may prevent OpenOCD from connecting to the device.
    - Mass erase is not supported.
- The `flash info 1` command will cause OpenOCD to crash when debugging an MSP432P4 on 64-bit Cygwin. The command works correctly on 32-bit Cygwin.
- The `verify` option for the `program` command may take a long time to complete on some devices.
- XDS110 Pod (standalone debug probe) is not supported by this release.
- XDS110 connection may not be reliable when running on a virtual machine such as VirtualBox.

Release History

- **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.