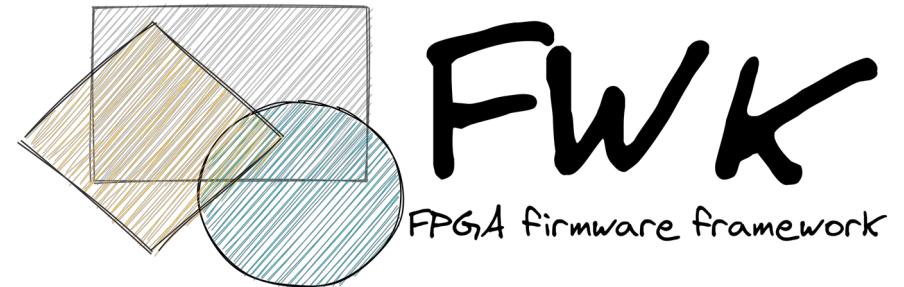


Generic FPGA Firmware Framework

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Generic FPGA Firmware Framework

Little History

Started in 2013 for LLRF

- Currently it is used to provide firmware for:
 - LLRF Regulation of many facilities in and outside of DESY: EuXFEL, FLASH, TARLA, HZDR, HZB, REGAE...
 - Laser Synchronization in EuXFEL
 - Special Diagnostics in EuXFEL
 - Cavity Tuning (Motors and Piezo) in EuXFEL
 - ...
...
- Allowed to manage ~100 projects with 500 000 lines of VHDL code base and 45 contributors.
- Problem: everything in mono repository – easy to maintain but difficult to share, reuse and distribute

2019 decision:

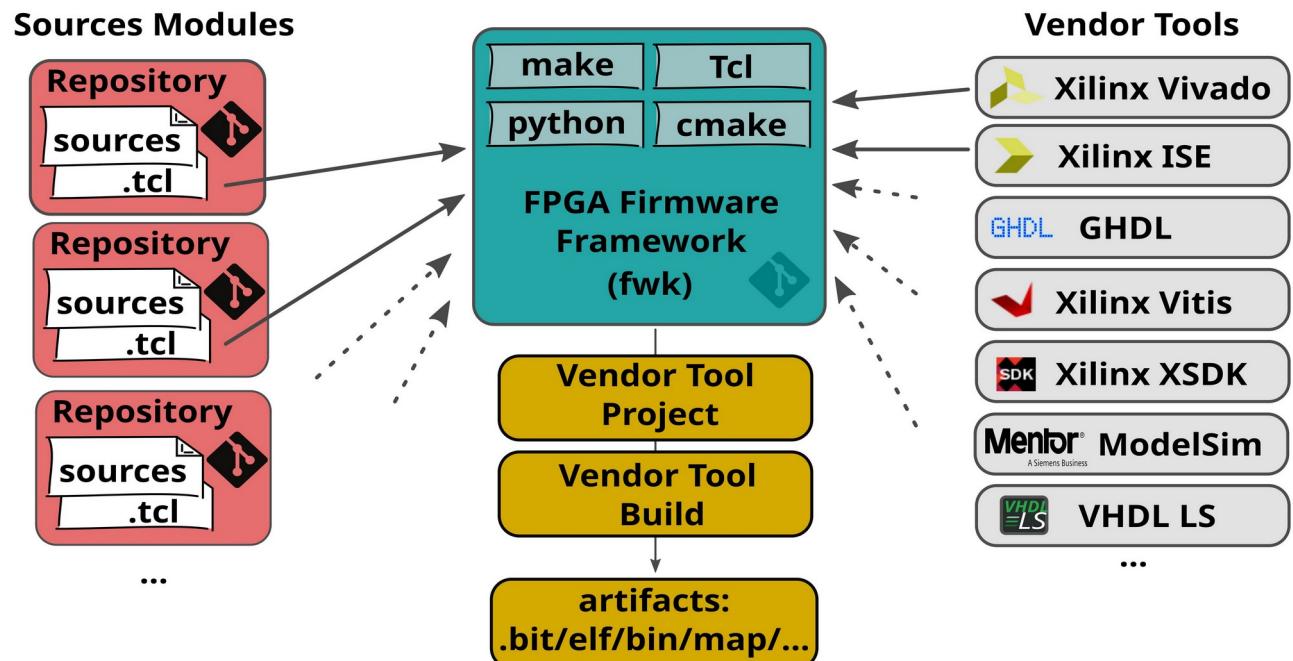
- decouple framework from the code base and make it open source
- restructure, improve and make more modular

Firmware Framework Structure

- Firmware framework (FWK) is a set of rules, structures, script and tools that give an abstraction layer.
- It is based on Tcl scripts with backend for each vendor. Makefile as a start point. python as extensions
- Each source module is a separate git repository with source files and FWK defined Tcl script.

The main features of the framework :

- Multiple vendor tools support
- The same way of building the firmware
- Allows easy regeneration of projects
- Constructs an address space for the SW (also link with ChimeraTK)
- Generates documentation
- Integrates HW and SW part of the FPGAs
- Automated versioning
- Continuous integration ready (Jenkins, Gitlab CI)



Open Source

Published at DESY Gitlab in Feb. 2022

Main repository:

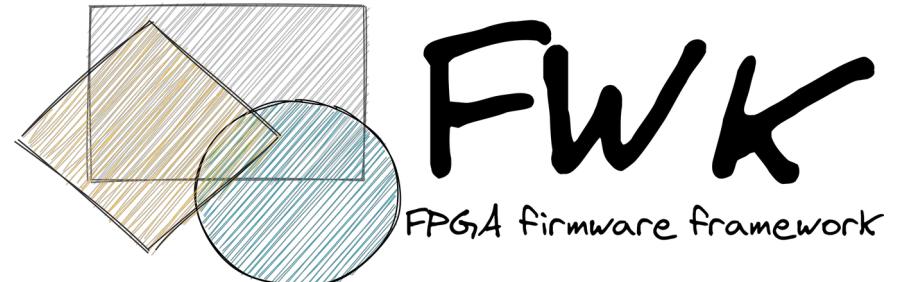
<https://gitlab.desy.de/fpgafw/fwk>

Documentation page:

<https://fpgafw.pages.desy.de/docs-pub/fwk/index.html>

License:

Apache-2.0



Thank you

Contact

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