Moritz Systems

Imagination turns to innovation

www.moritz.systems

Kamil Rytarowski
kamil@moritz.systems

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Who are we?

We are a Software House founded in 2020 by developers with 10+ years of professional experience on the IT market.

About us

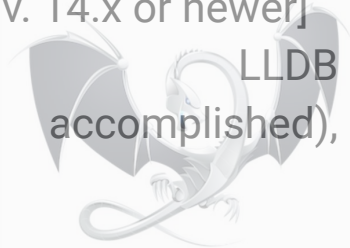
We are IT enthusiasts who believe that Free Software is the future of IT.

We have gained unique experience while supporting varity of Open Source projects, and now we have founded Moritz Systems to share this experience with our customers.

FreeBSD LLDB contracts (1)

The Moritz Systems team has been contracted for three projects:

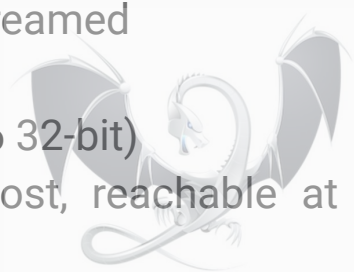
1. LLDB Debugger Improvements for FreeBSD
   3 months, 2020 - successfully accomplished [recommended LLDB v. 12.x or newer]
2. LLDB FreeBSD CPU target support and userland debugging improvements
   4 months, 2021 - successfully accomplished [recommended LLDB v. 14.x or newer]
3. FreeBSD KGDB support in LLDB
   6 months, 2021 - ongoing (3/6 milestones accomplished), the planned time of delivery: January 2022



FreeBSD LLDB contracts (2)

Work organization in the FreeBSD Foundation contracts:

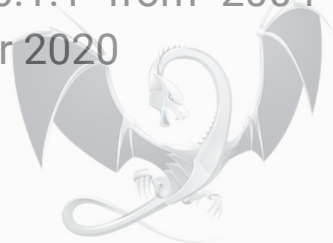
- when possible, reuse prior work developed by us for the NetBSD Project
- split the project into appropriate milestones, each taking approximately one month to complete
- a milestone is considered complete after being reviewed and upstreamed
- two developers: Kamil Rytarowski and Michał Górny
- primary focus on AMD64 (Intel x86_64), ARM64 and i386 (Intel x86 32-bit)
- each milestone is documented on a publicly available blog post, reachable at https://www.moritz.systems/blog/



FreeBSD LLDB contracts (3)

The primary goals of the contracts:

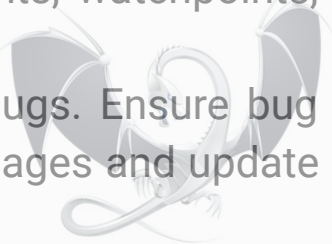
- produce a full drop-in replacement for the GNU binutils/GDB debugging stack (GPLv3), distributed on a permissive and reusable license (currently Apache 2.0)
- head for reasonable GDB compatibility, feature parity, interoperability
- removal of the legacy GNU debugger (GPLv2) copy - version 6.1.1 from 2004 (contrib/gdb) from the FreeBSD project - accomplished in December 2020
- modernize the FreeBSD LLDB support and remove legacy code
- ensure first-class support for FreeBSD in the LLVM/LLDB project



Contract 1: LLDB Debugger Improvements for FreeBSD

The project has been divided into three milestones:

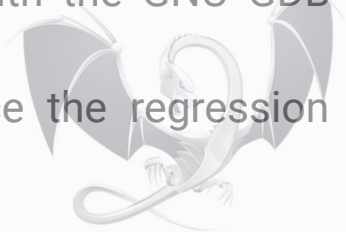
- M1 Introduce new FreeBSD Remote Process Plugin for x86_64 with basic support and upstream to LLVM.
- M2 Ensure and add the mandated features in the project (process launch, process attach (pid), process attach (name), userland core files, breakpoints, watchpoints, threads, remote debugging) for FreeBSD/amd64 and FreeBSD/i386.
- M3 Iterate over the LLDB tests. Detect and as time permits fix bugs. Ensure bug reports for each non-fixed and known problem. Add missing man pages and update the FreeBSD Handbook.



Contract 2: LLDB FreeBSD CPU target support and userland debugging improvements

The project has been divided into four milestones:

- M1 Switch all the non-x86 CPUs to the LLDB FreeBSD Remote-Process-Plugin
- M2 Iteration over regression tests on ARM64 and fixing known bugs, marking the non-trivial ones for future work. Remove the old local-only Process-Plugin.
- M3 Implement follow-fork and follow-vfork operations on par with the GNU GDB support. Cover the functionality with LLDB regression tests.
- M4 Implement SaveCore functionality for FreeBSD and enhance the regression testing of core files in LLDB. Update the FreeBSD manual.



Contract 3: FreeBSD KGDB support in LLDB (1)

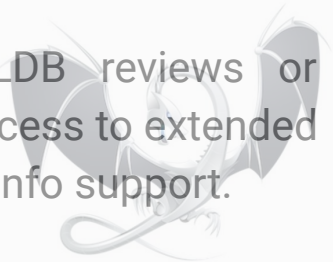
The project has been divided into six milestones. The three accomplished milestones are:

- M1 Improve LLDB compatibility with the GDB protocol: fix LLDB implementation errors, implement missing packets, except registers.
- M2 Improve LLDB compatibility with the GDB protocol: support gdb-style flexible register API.
- M3 Support for debugging via serial port.

Contract 3: FreeBSD KGDB support in LLDB (2)

The project has been divided into six milestones. The three ongoing milestones are:

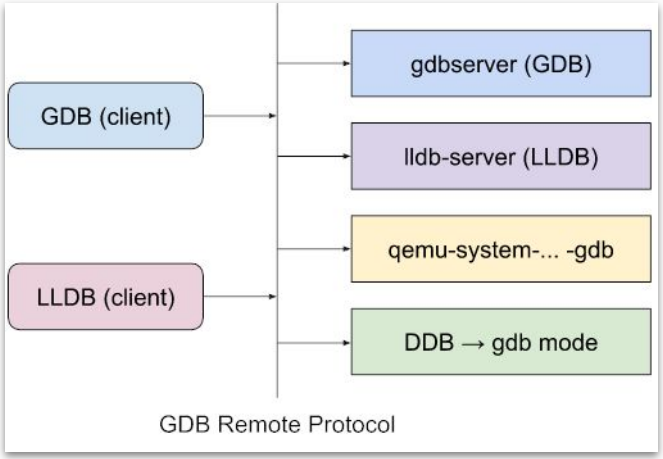
- M4 libkvm-portable and support for debugging kernel core files in LLDB, on amd64 + arm64 platform. Support for other platforms as time permits.
- M5 Support for debugging the running kernel on amd64 + arm64 platform. Support for other platforms as time permits.
- M6 Extra month for kgdb work, processing patches on LLDB reviews or miscellaneous tasks – as time permits. Examples of misc tasks: access to extended system and process information, starting processes via shell, $_siginfo support.



Future FreeBSD/LLDB ideas

Categories of potential further development:

- extend the LLDB support to additional CPUs
- further GDB compatibility improvements
- new general features
- FreeBSD dedicated addons in/for LLDB
- more active maintenance of the FreeBSD buildbot
- … GNU GDB improvements



Check our LLDB progress and services

https://www.moritz.systems

https://github.com/moritz-systems