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DWARF extensions for optimized SIMT/SIMD (GPU) debugging

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Abstract:
AMD has been working on adding support for GPU compute debugging to GDB. Early on, it became apparent that current DWARF would not be sufficient to support optimized SIMT/SIMD code, so we came up with extensions and generalizations that we intend to propose to DWARF 6. Although designed with GPUs in mind, the extensions are generic and can just as well be used to improve quality of debug information for CPUs and for any architecture. We've implemented the extensions in GDB, and are in the process of implementing them in LLVM. One interesting area that required extensions is DWARF expressions, support for which we're currently upstreaming to GDB. In this presentation we will give an overview of what were the problems we saw, and what we've done to address them. More information on the subject and on our proposed DWARF extensions can be found here: https://llvm.org/docs/AMDGPUDwarfExtensionsForHeterogeneousDebugging.html

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