Dwarf for GPUS

Working Group Outbrief

Scalable Tools Workshop 2025

Attending members

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Repo explaining DWARF support for GPUs

https://github.com/ccoutant/dwarf-locations/tree/main

The DWARF Standard website : https://dwarfstd.org/

Snapshot for DWARF 6 : https://snapshots.sourceware.org/dwarfstd/dwarf-spec/

Changes vs. AMDGPU spec

- Theirs was more vendor oriented - tried to retrofit DWARF 5
- Standard opcodes
- Overlays were not used in practice
- Refined types
- Divergent flow control is now well defined

Address Space

- `DW_OP_form_aspace_address`
- Addrspace ids are arbitrary - defined by the producer and must be respected by all the consumers
- Should there be a registry of ABIs ?

Divergent control flow

- In predicated code, you have to find the associated “virtual” PC of a thread
- If it’s inactive, “its” PC is at the end of the block that’s currently being executed (since the wavefront has a different PC) - reconvergence point
- Debate on SIMD/SIMT semantics - Settled by Hennessy & Patterson

Requests

- “Registry” of operations that can be shared between producers
- Semantics of writing on shared data