



(Single File) split DWARF5

Mark Wielaard, perftools 2022 goal



General idea

We never really finished the DWARF5 support across all our tools. Specifically things to do with split-DWARF. This is because GNU DebugFission was completely independent and so could be ignored when not used. It only seemed to help with speeding up the development edit/compile/debug cycle, but when doing distribution/packaging the saved time (e.g. string table merging) got lost again. And having an extra output file (the .dwo) kind of messes up build systems.

Three separate technical goals

- Support for "indexed" forms (which are now valid without using split DWARF CUs). DW_FORM_strx[1234], DW_FORM_addrx[1234], DW_FORM_loclistx, and DW_FORM_rnglistx
- Support for split DWARF CUs. DW_UT_skeleton, DW_UT_split_compile (technically there is also DW_UT_split_type). This impacts how to walk a DIE tree.
- Support for single file split DWARF. This uses the same trick as LTO early debug, SHF_EXCLUDED, so the linker ignores the extra sections. This makes the previous point slightly easier because there now is no separate .dwo file to lookup.

Producers, consumer, package

- Producers: gcc needs to learn to use the indexed forms in non-split mode (if more efficient). Needs to use SHF_EXCLUDED when doing single file mode.
- Consumers: elfutils need to support single file mode. Binutils needs to consume indexed forms. systemtap can mostly rely on elfutils but needs to learn how to walk split DWARF DIE trees. Same for libabigail and needs more efficiently compare indexed strings. gdb needs to accept indexed forms in non-split DWARF.
- Packaging: debugedit needs to handle indexed forms, same for dwz. find-debuginfo.sh (part of debugedit now) needs collect split DWARF parts (either multi or single file) maybe based on dwz or a new eu-dwp tool?