Clang!

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May 6, 2009

Contents

LLVM? Clang?

- LLVM: Low-Level Virtual Machine.
- It's a virtual machine infrastructure; not a virtual machine.
- It's a compiler infrastructure; not a compiler.
- Clang is a C/ObjC/C++ compiler frontend, which uses LLVM as its backend.
- LLVM-GCC is a modified version of GCC with an LLVM backend.

Features/the cool stuff

- Advanced features, like link-time optimization.
- Very compatible with GCC. Supports many attributes, etc.
- Better warnings and error messages than GCC.
- Optimizer that's (most of the time) better than GCC.
- BSD-like license.
- Very accessible developer community.
- Commercial users (Apple, Adobe, Cray, EA, Siemens, Sun).

Why do we want this?

- GCC in base seems to be a dead end, mainly because of GPLv3.
- GCC's performance has also been decreasing.
- It's always good to look at the competition.

Timeline

- May 2008: Chris Lattner gave a talk at the conference.
- June 2008: I did some small experiments with llvm-gcc, only submitted a bug or two.
- October 2008: Roman Divacky started submitting bug reports for clang.
- February 2009: Out of interest, I joined the #freebsd-clang channel.
- March 2009: I started maintaining the llvm-bmake branch: Clang in base.
- April 2009: Clang gains FreeBSD hostinfo.

Status

- We can build and boot kernels with Clang.
- We can build most world sources, except some (important) libraries.
- It turns out we can build a lot of ports. X11 only blocks on ~5 ports.
- Most issues are only related to a small amount of bugs, unlike with the Linux kernel.

Issues

- Some inline asm input/output constraints are missing.
- #pragma support is still incomplete (weak, pack).
- Crash bugs, related to MMX support (mmintrin).
- C++ support is still immature, even though Clang is written in C++.
- License issues: libgcc, libstdc++.
- Binary size: 10-20 MB.
- Platform support: better than we think, but not as good as GCC 4.2.

Future?

- Even though LLVM is awesome, we're not there yet.
- Import llvm-bmake into the projects space in SVN.
- Perform some experimental ports builds with Clang.
- Add Clang to FreeBSD 9 as an experimental feature?

Questions?

(Thanks to Brooks Davis, Christoph Mallon, Diane Bruce, Ollivier Robert, Pawel Worach and Roman Divacky!)