ClangBSD

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What is this all about?
What is this all about?

- GCC 4.2.1/Binutils 2.15 and no updates allowed
- Old, buggy, unmaintainable
- Missing features - C++0x, newer CPUs support
- .... solution?
What is Clang/LLVM?
What is Clang/LLVM?

C/C++/ObjC compiler
What is Clang/LLVM?

Mature
What is Clang/LLVM?

Developer friendly
What is Clang/LLVM?

BSDL-like licensed
What is Clang/LLVM?

- Supports - X86, ARM, PowerPC, Mips, Sparc etc.
- Advanced optimizations (LTO, JIT etc.)
- Drop-in replacement for GCC
- Fast, understandable warnings, easy to contribute
- Used everywhere (ruby, php, python, MacOSX ...)
- Actively developed (Apple, Google, Cray, OSS ...)

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What is Clang/LLVM?

- compiler-rt
- llvm-mc
- static analysis
- libc++
What is Clang/LLVM?

- http://clang.llvm.org
- http://llvm.org
What is Clang/LLVM?

DEMO
What is Clang/LLVM?

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ClangBSD
What is Clang/LLVM?

Compile times

- **kernel**: 6.77%
- **world**: 9.87%
- **clang/llvm**: 33.51%

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What is ClangBSD?
A lot of testing....
What is ClangBSD?

...and analyzing/bug submitting
What is ClangBSD?

- Clang/LLVM build system integrated into FreeBSD
- Small modifications to the buildsystem
- Aim at supporting all GCC-driver-compatible compilers
- Bug fixes and workarounds in the FreeBSD sources
Status of ClangBSD
Status of ClangBSD?

Compiles everything...
Status of ClangBSD?

...on amd64 and i386

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1We even have FreeBSD printf extensions :)
Status of ClangBSD?

- AMD64 compiles and works just fine
- i386 miscompiles some pieces but fine otherwise
- ARM - good support but no FreeBSD interest
- Mips - Oleksander Tymoshenko, missing -mno-abicalls
- PowerPC - Nathan Whitehorn, missing va args handling
- Sparc64 - missing 64bit ABI support, work-in-progress
- IA64 - removed in the past, no effort here
Status of ClangBSD?

- Code size problems (i386/boot2)
- Inline asm not 100% on X86 (libc, mplayer)
- Warnings all over the place
- Miscompilations
- Profiling missing
Status of ClangBSD?

Difference to what will be integrated

- Clang as the default compiler
- contrib/llvm contains unnecessary stuff
- Unfinished integration upstream (driver changes etc.)
- Makefile.inc1 needs to be polished
- Changes to src
Ports

- Ongoing effort (kwm, rene, andrius)
- Lots of hardcoded gcc stuff
- C99 vs C89
- Clang is more strict than GCC 4.2
Future of ClangBSD
Future of ClangBSD?

Integration!
Future of ClangBSD?

- Runtime testing calls
- Internal discussion
- Import!
Questions?