



OpenMP* 4 Support in Clang* / LLVM*

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Clang*: An Excellent C++ Compiler.



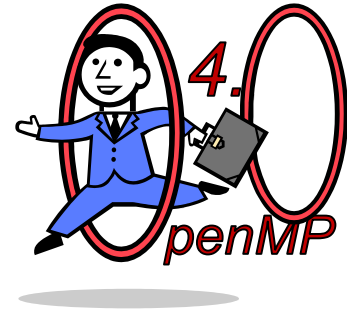
- LLVM*: “Collection of modular and reusable compiler and toolchain technologies”
 - Created by Chris Lattner and Vikram Adve at UIUC*
 - Developed by Apple*, Google*, Intel, IBM*, Sony*, ARM*, ...
- Clang: “...a new C, C++, Objective C and Objective C++ front-end for LLVM compiler”
 - First to implement full C++11 (and now C++14) support
- Open source under “UIUC” BSD-style license

...That Is Late To OpenMP* Party



- Driving forces behind Clang/LLVM are not interested in OpenMP and HPC in general
- Development of OpenMP support started in late 2012
 - First by AMD* and Intel
 - Now ANL*, IBM*, Micron*, Pathscale*, TI* and UoHouston* are involved
 - Proprietary (non open-source) implementations existed before
- Available at clang-omp.github.com...
 - Based on clang/llvm 3.5 release
- ...but not in Clang/LLVM trunk yet
 - OpenMP 3.1 support planned for llvm 3.6

OpenMP 4.0: Already Here!



- Everything implemented...
 - Including tasking enhancements, pragma omp simd
 - x86, x86-64, POWER*, ARM* supported
 - Again, in github only; plan to upstream in time for llvm 3.7 release
- ...with one big exception: offloading
 - Both design and implementation are under development
- Pragma omp simd
 - Feature complete (in github), basic functionality (in trunk)
 - Vectorizer tuning under development
 - Available in clang/llvm 3.5 (-Xclang -fopenmp=libiomp5)
- Intel OpenMP Runtime Library
 - Open-sourced under the same license as LLVM; openmp.llvm.org
 - OpenMP 4.0 fully supported

You Are Welcome!

- Help with development
 - Code, tests, bug reports
- Use OpenMP-enabled clang!
 - Get performance boost
 - Report your results to us
 - Influence future developments
 - Innovate on top of what we did
- clang-omp.github.com, openmp.llvm.org



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