

LLVM

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Components

- language-dependent frontend compiler
- SSA-based intermediate representation
- optimizing offline and JIT backends

Cleverness

- abstraction height of LLVM IR seems to be **just right™**
- high enough to be richer than machine code
 - represents some limited type info
 - SSA form simplifies lots of analysis steps
- low enough to be generic and efficient
 - virtually all languages can be represented

Consequences

- persistent program information
- offline code generation
- user-based profiling and optimization
- transparent runtime model
- uniform, whole-program compilation