



# Project Dependency Impact on Clang's Build Time

Javier E. Martinez  
Software Engineer, Intel  
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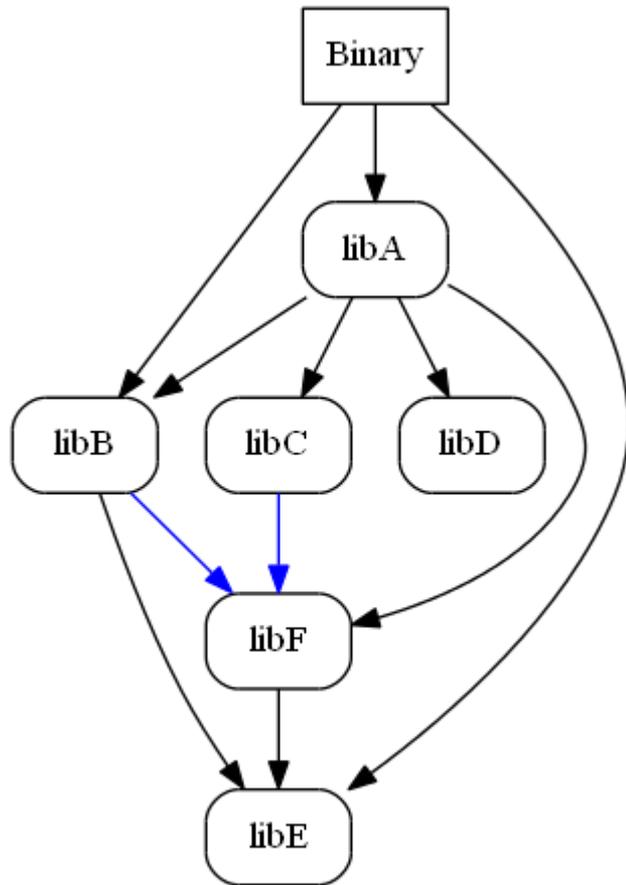
# Motivation

- Clang and LLVM contain lots of files which add up to compilation time
- Long compilation times affect many areas of the software development lifecycle
- A distributed build system reduces that time by compiling in parallel (e.g. multicore or using other agents)
- Excessive project dependencies restrict the number of files that can be built in parallel
- If not set correctly, **project dependencies can lead to increased build times!**

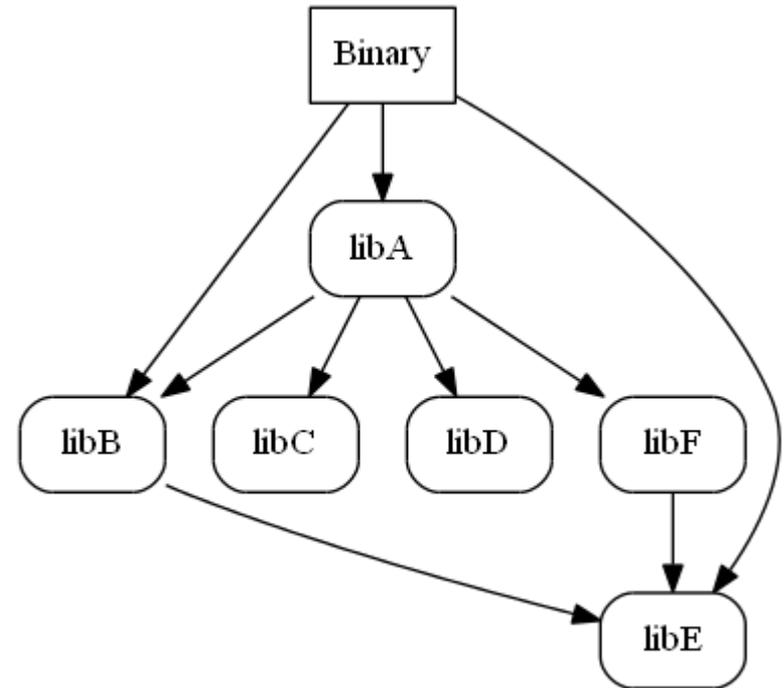
# Tweaking Project Dependencies

- Currently a painful process:
  1. Start at the target project (e.g. Clang or llc)
  2. Remove dependencies
  3. Build project
  4. Examine failures and add dependencies
  5. For every project added go to step 2
- Linking errors mean project-project dependencies
- Compilation errors mean file-file dependencies but they establish project-project dependencies
- We're investigating ways of automating this process

# Example



Unoptimized Project Dependencies



Optimized Project Dependencies

# Clang Results

Build	Before (mm:ss)	After (mm:ss)	Improvement
Debug 32	11:55	9:30	20.28%
Debug 64	20:15	10:00	50.62%
Release 32	4:30	2:30	44.44%
Release 64	7:26	2:44	63.23%



Thank You



