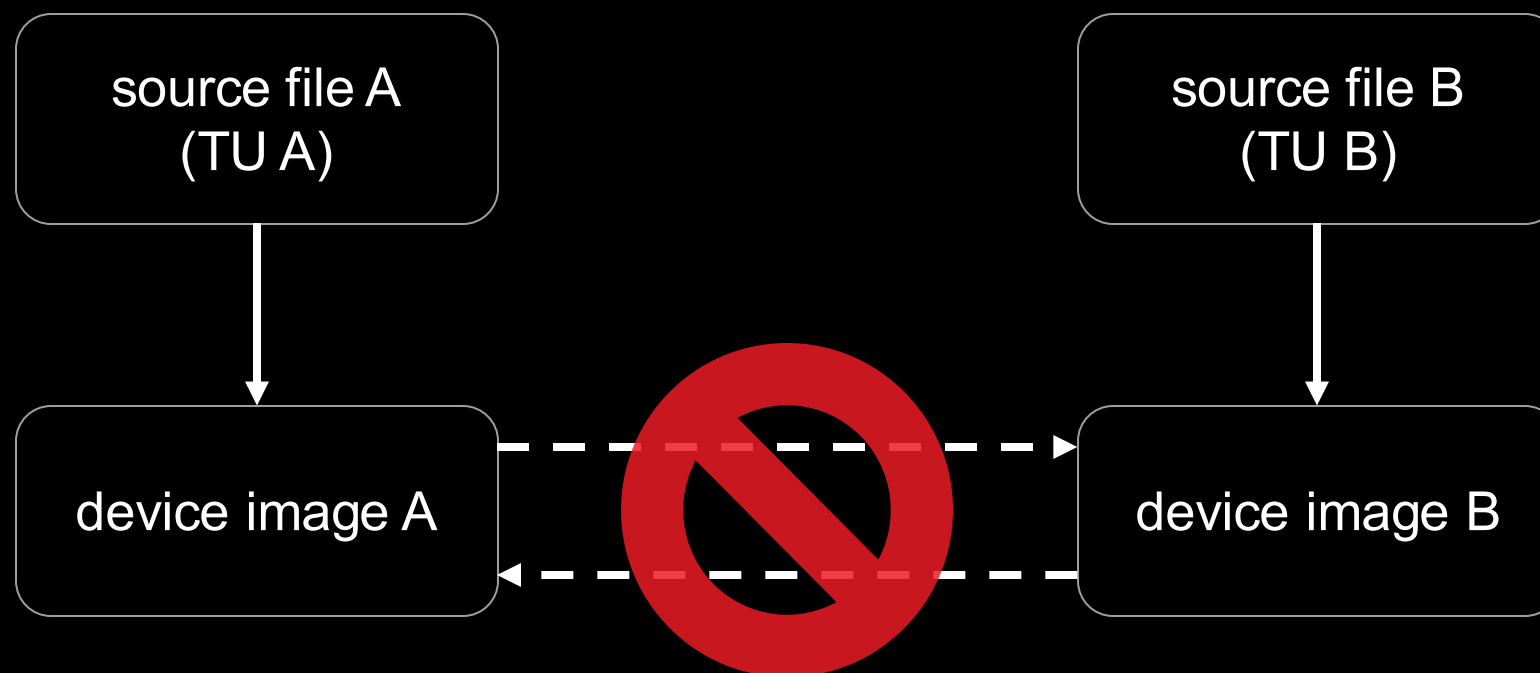




Extending ThinLTO Support for AMDGPU

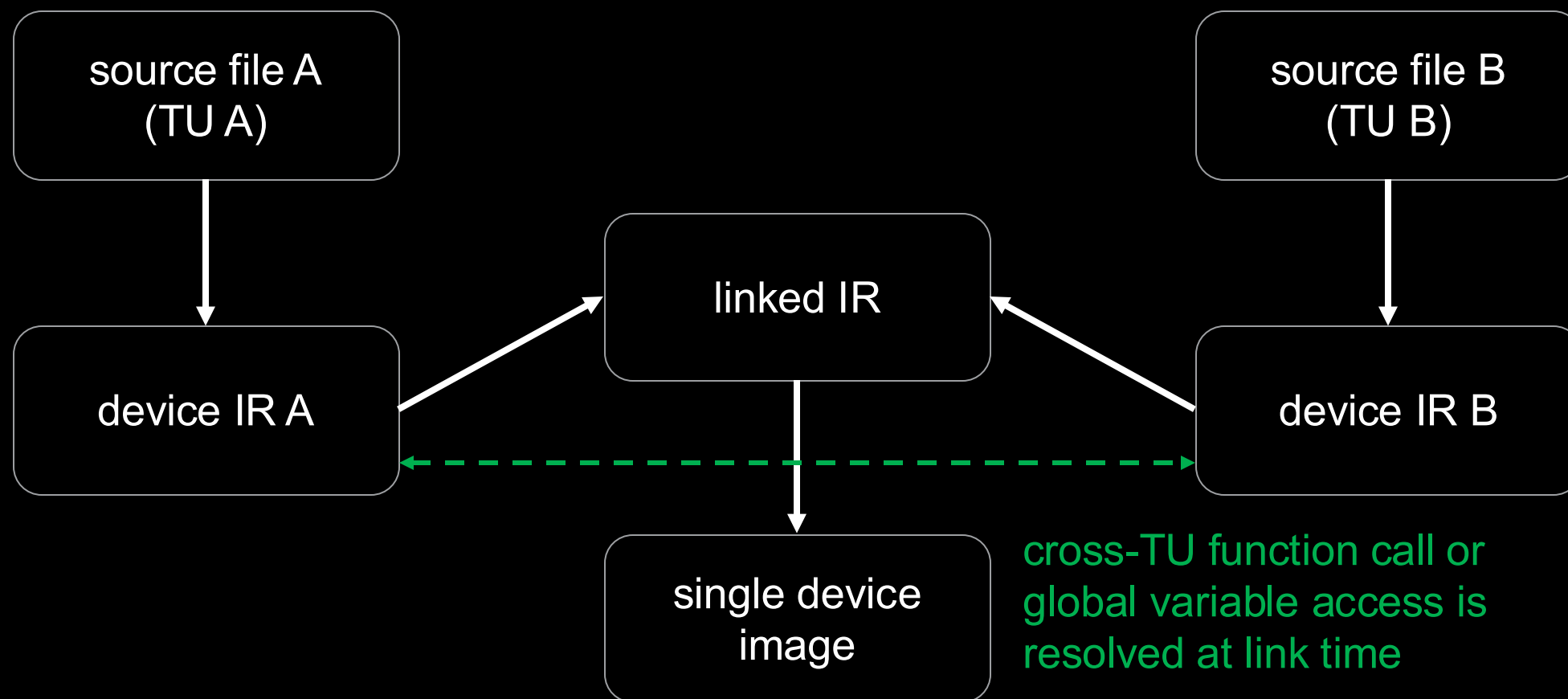
Shilei Tian <Shilei.Tian@amd.com>

Background & Motivation: Default Compilation

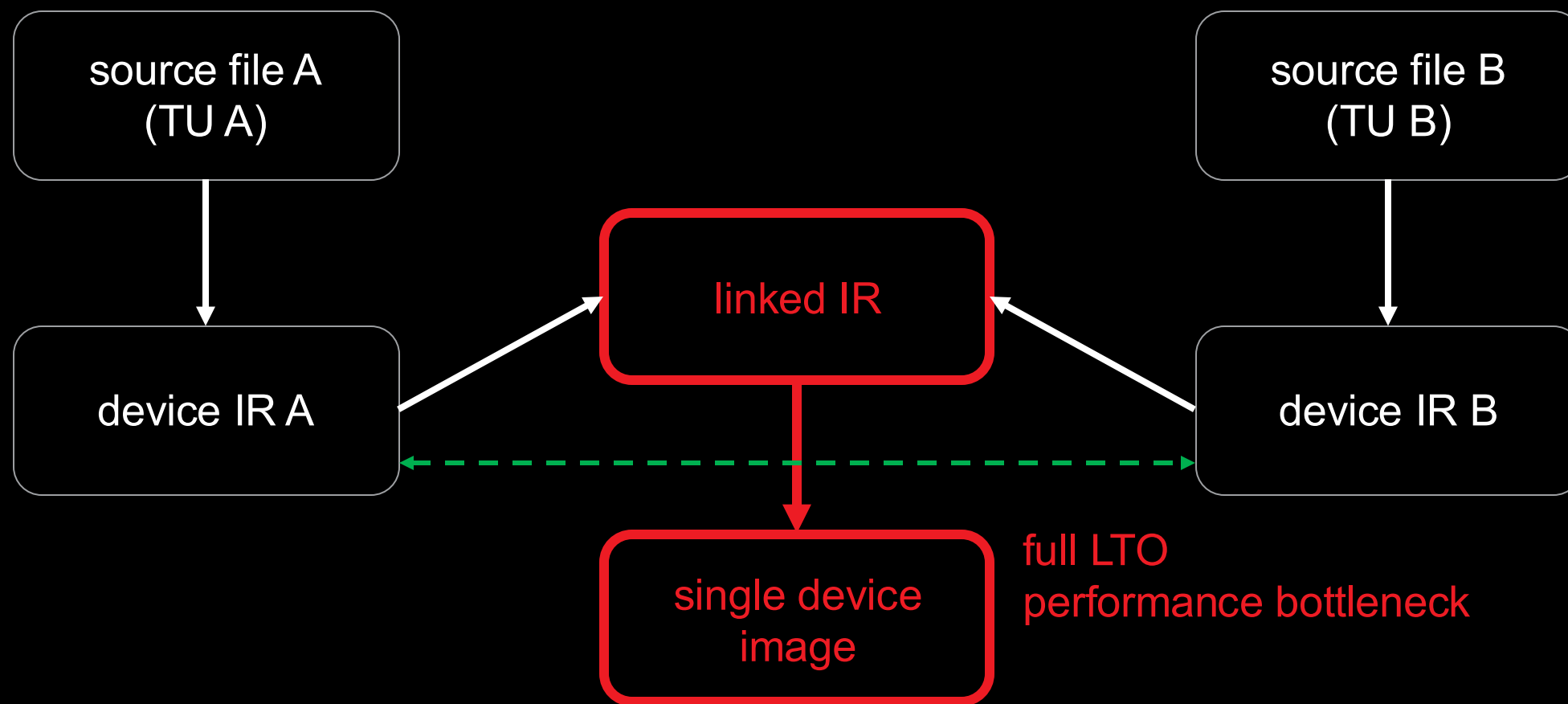


no cross-TU function call or global variable access

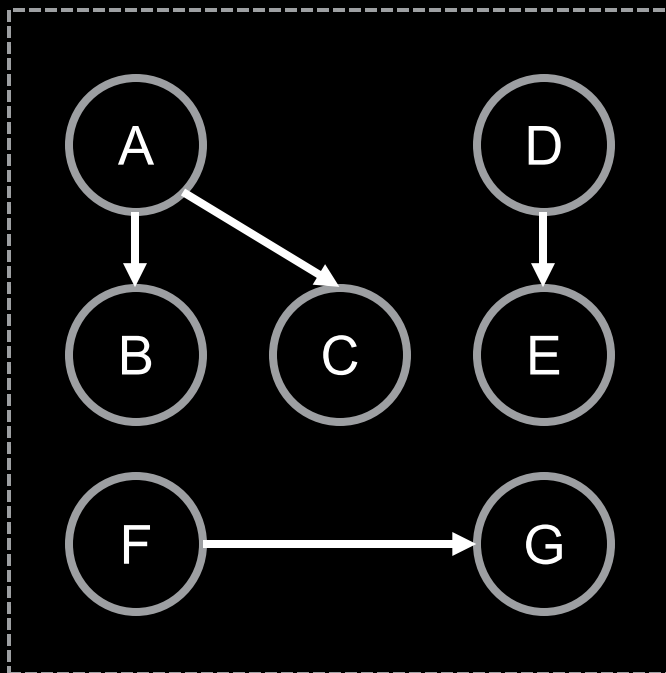
Background & Motivation: GPU-RDC (-fgpu-rdc)



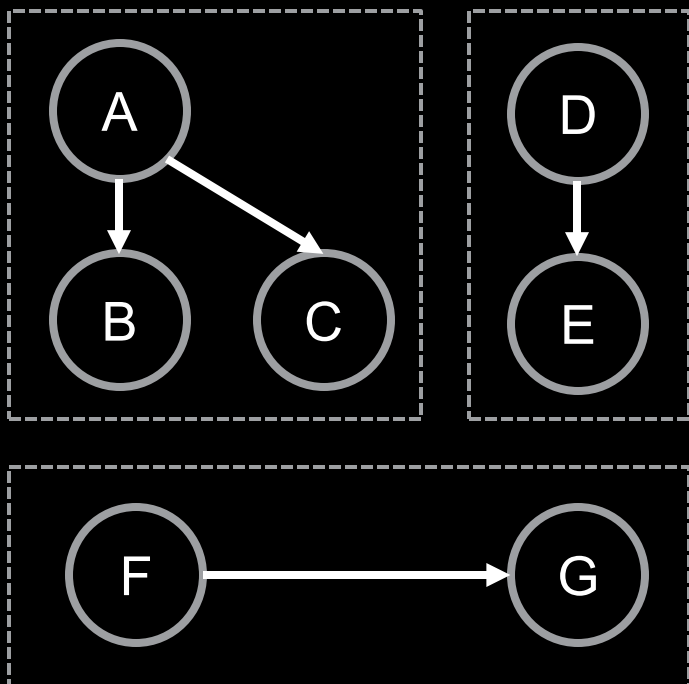
Background & Motivation: GPU-RDC (-fgpu-rdc)



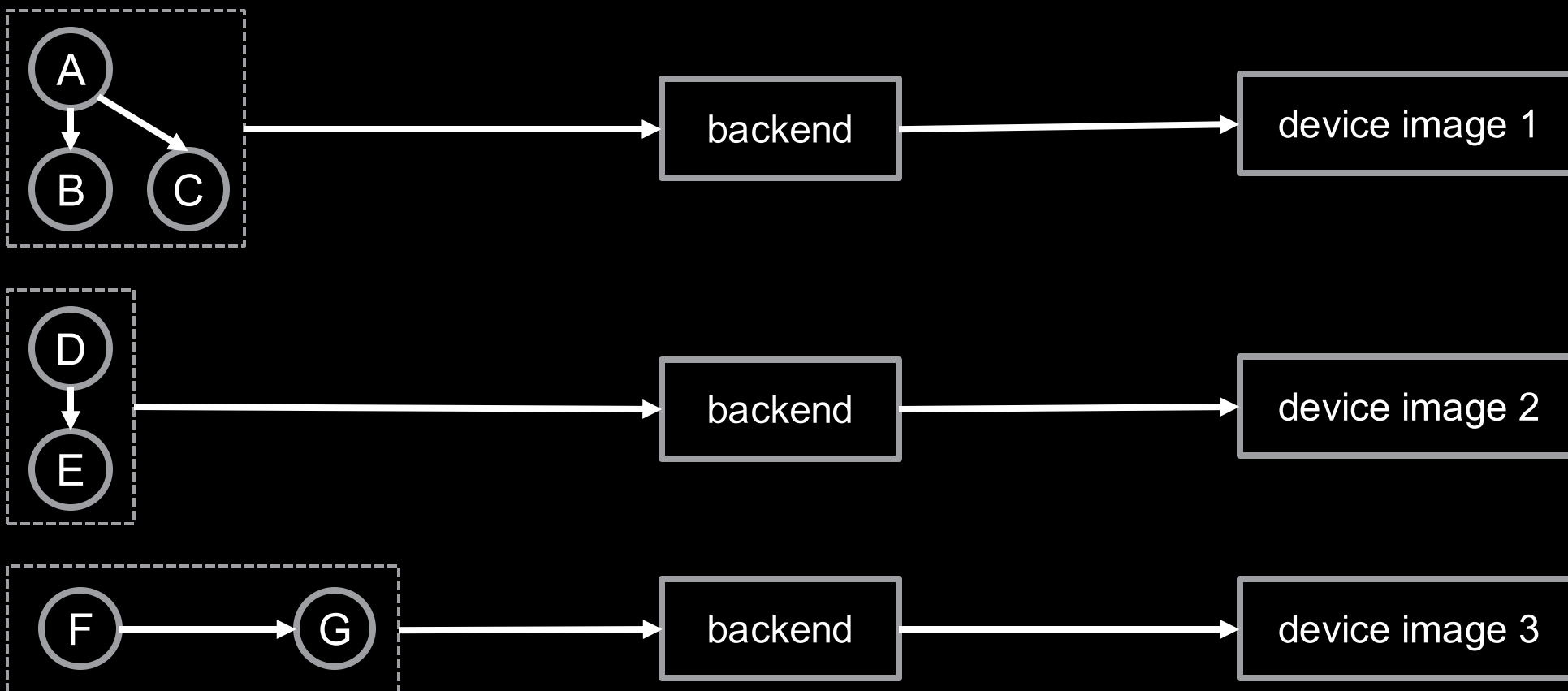
Background & Motivation: Module Split



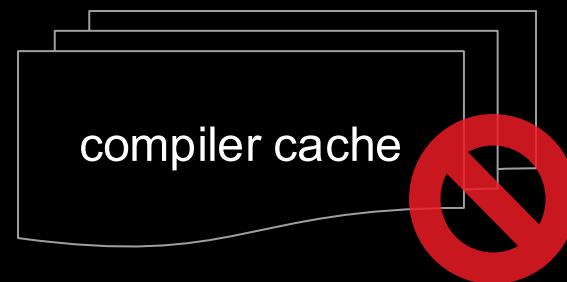
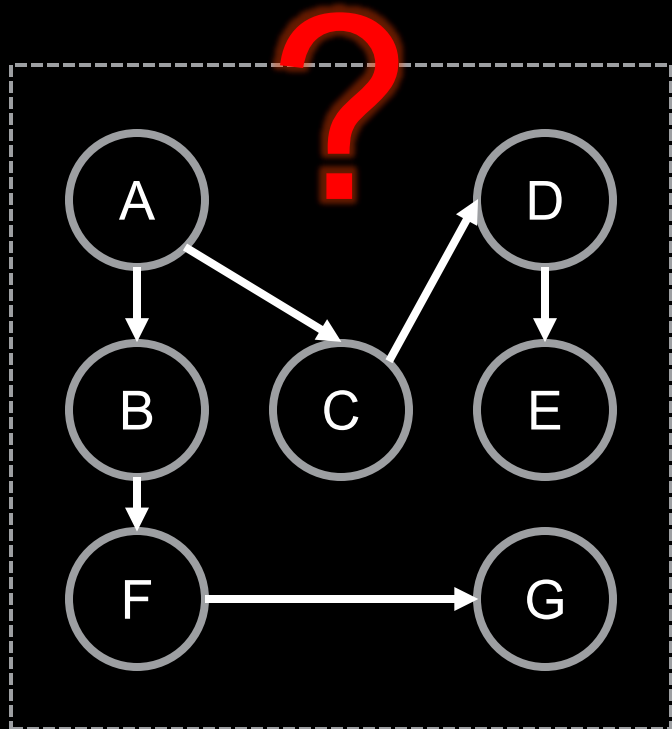
Background & Motivation: Module Split



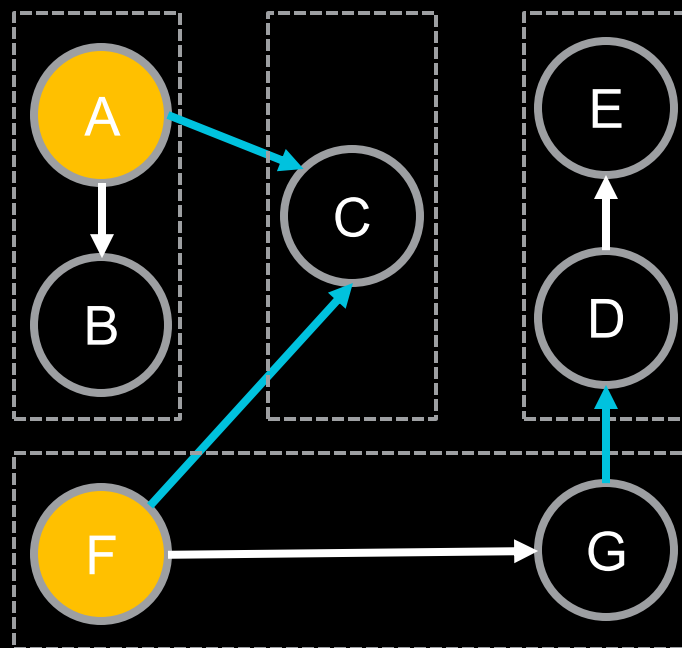
Background & Motivation: Module Split



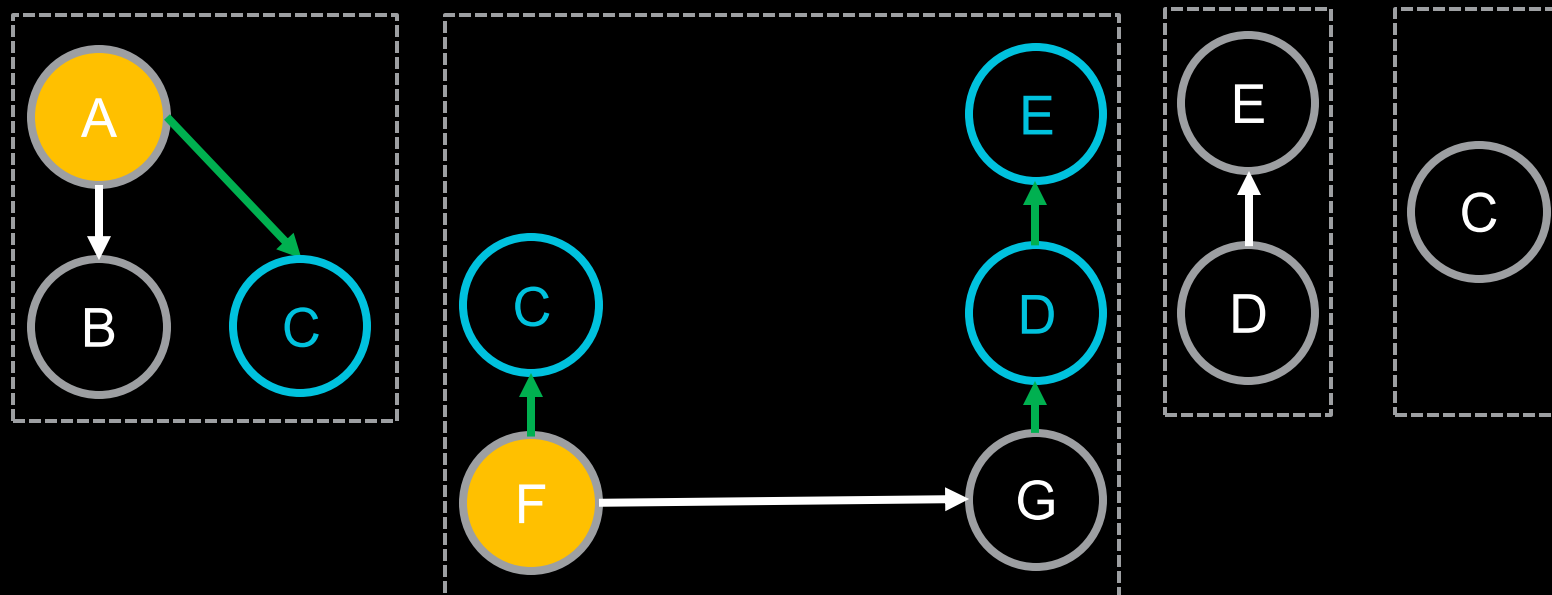
Background & Motivation: Module Split



Background & Motivation: ThinLTO

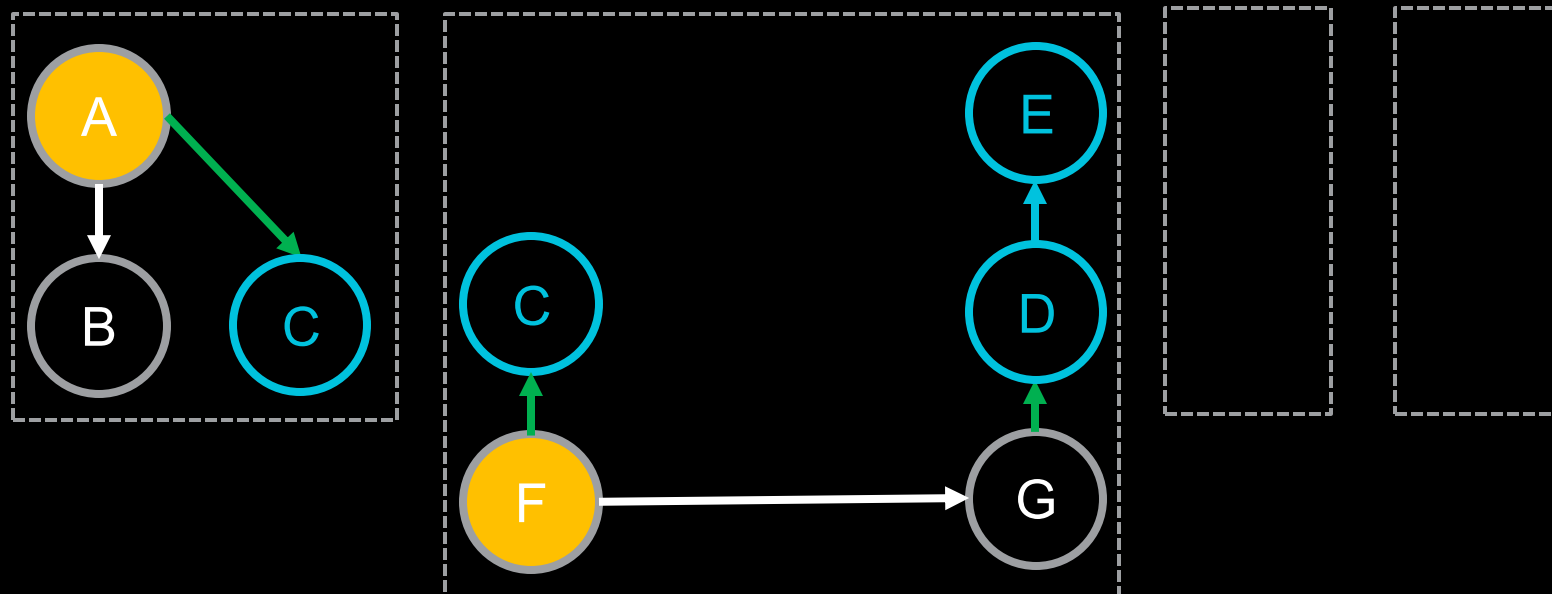


Background & Motivation: ThinLTO



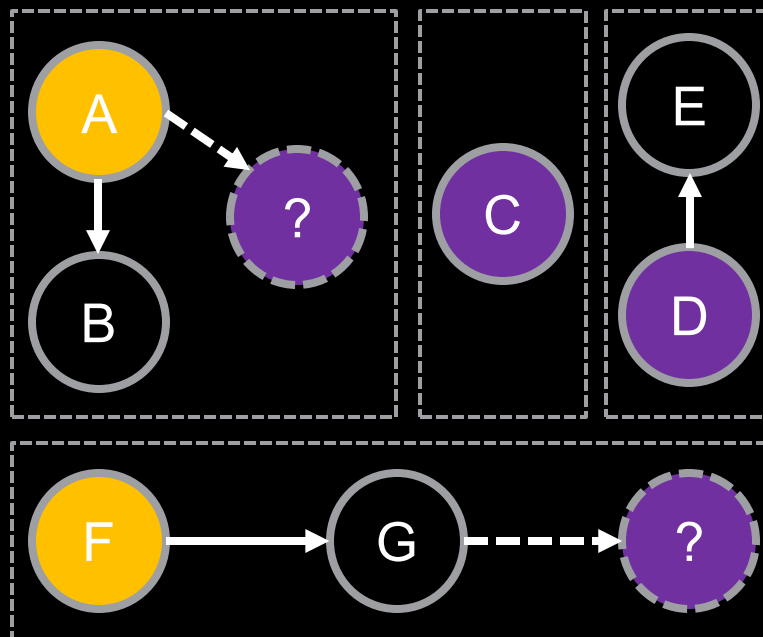
`-force-import-all=true`

Background & Motivation: ThinLTO



-force-import-all=true
-amdgpu-internalize-symbols=true

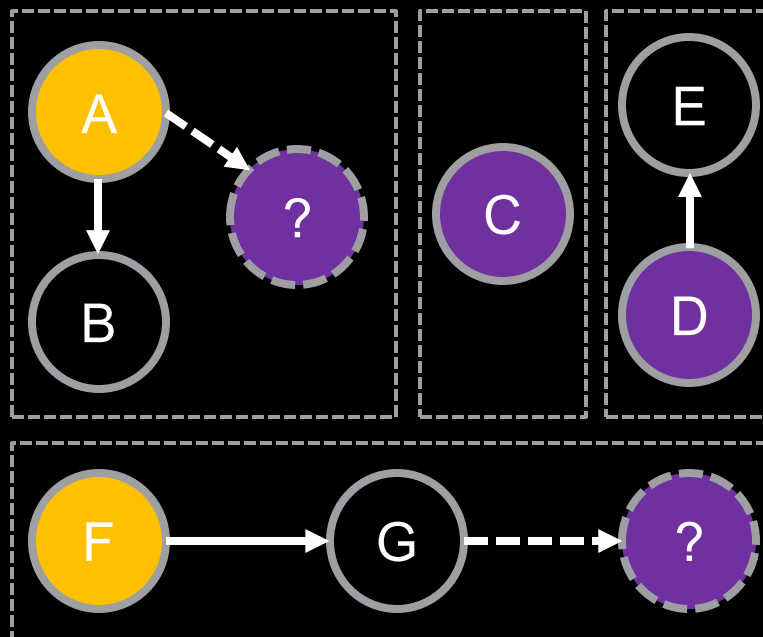
Background & Motivation: ThinLTO Limitation



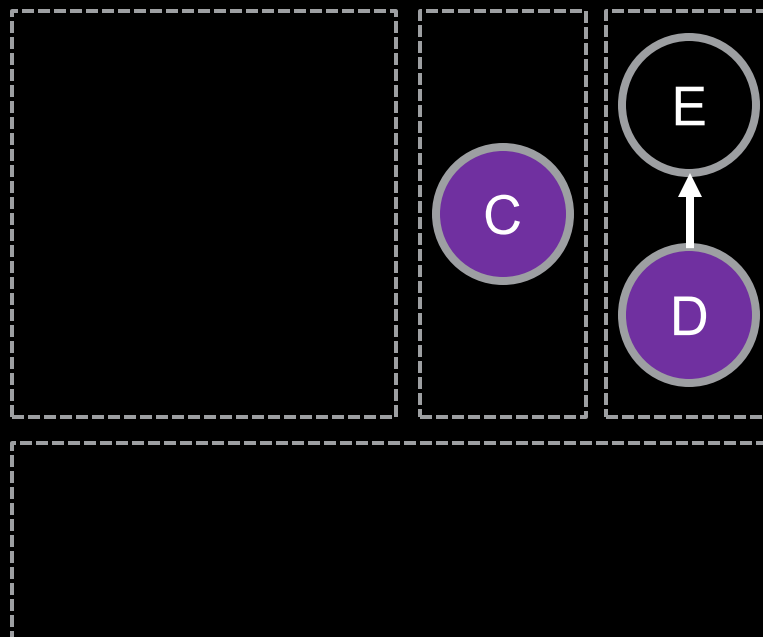
ThinLTO: Current Status

- ThinLTO works in most cases with the LLVM trunk.
 - Use: `-fgpu-rdc -foffload-lto=thin`
 - Direct external function calls and shared variables (LDS) work fine.
- Indirect function calls, however, *may or may not* work **without any errors or warnings** at compile time.
 - This includes all forms of indirect calls, such as C++ virtual functions.

Proposal: Two-Round Compilation

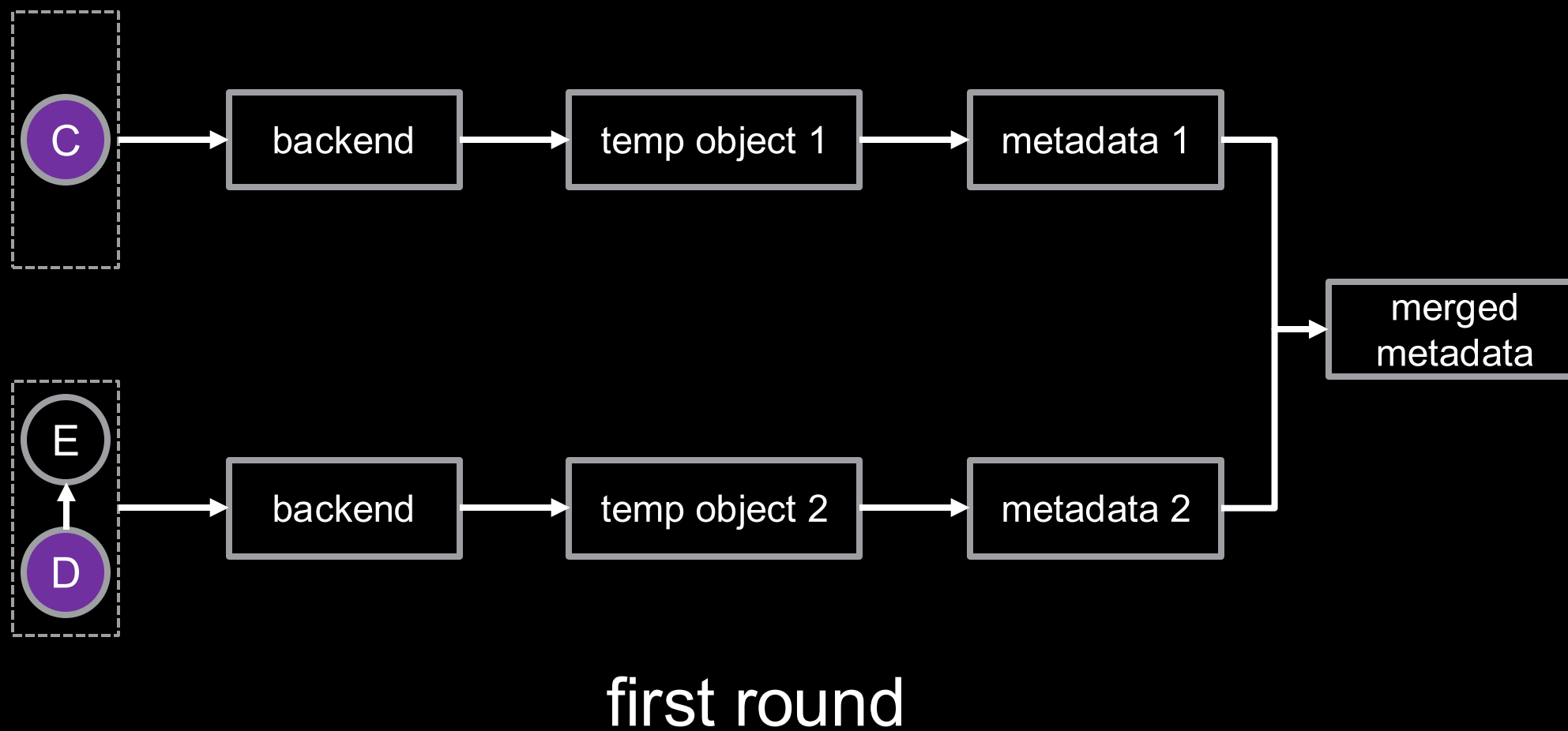


Proposal: Two-Round Compilation

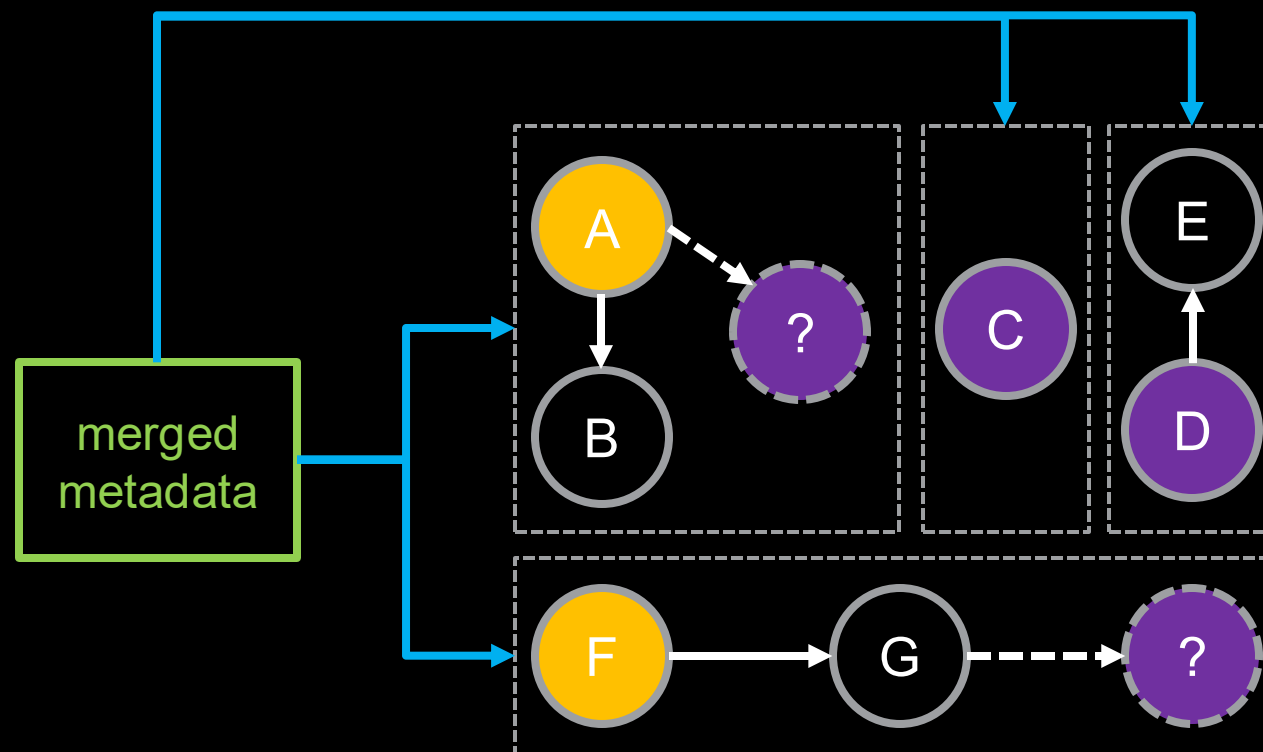


first round

Proposal: Two-Round Compilation

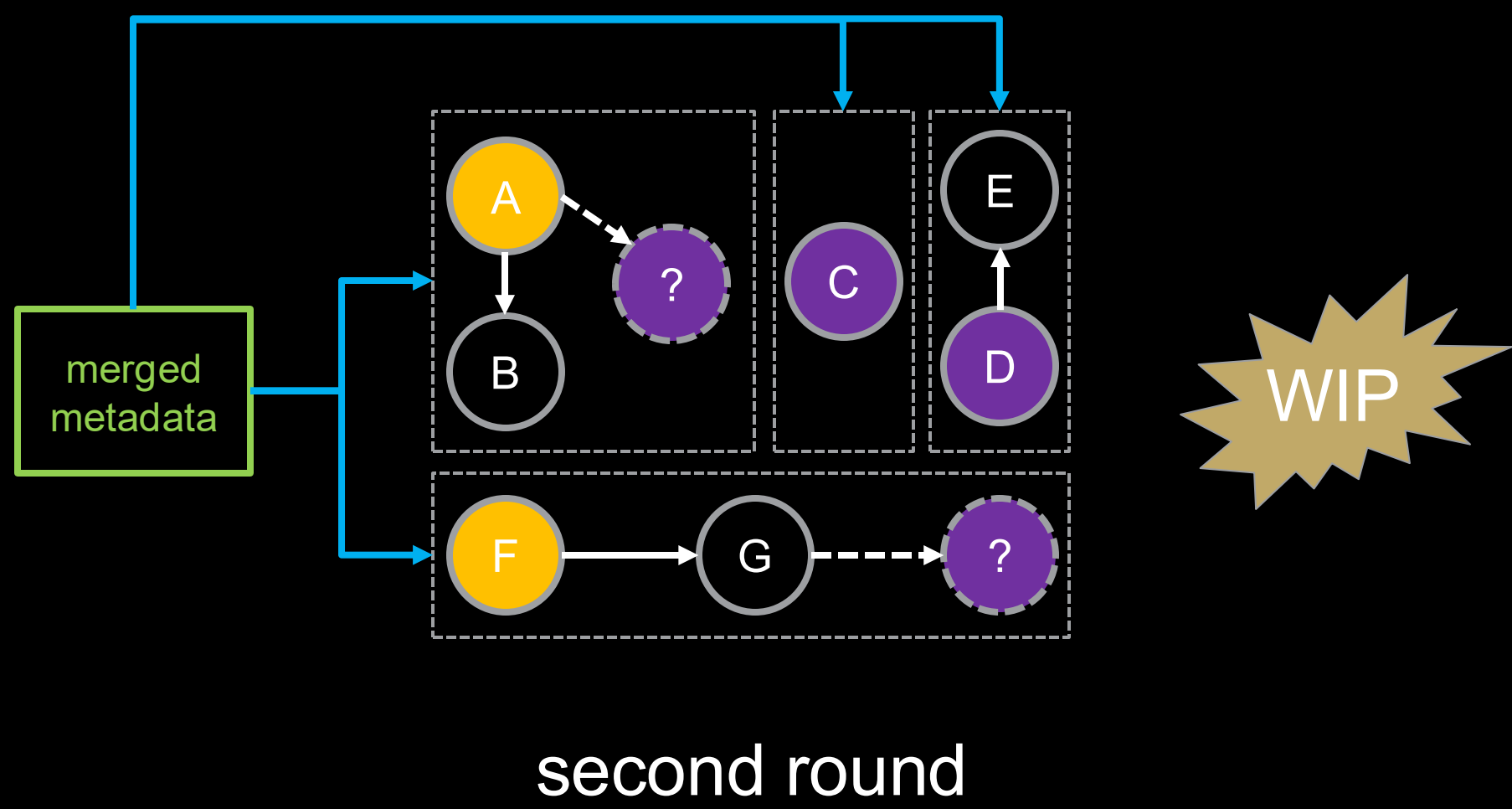


Proposal: Two-Round Compilation



second round

Proposal: Two-Round Compilation



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