C++ as a service — rapid software development and dynamic interoperability with Python and beyond

Interactive C++: cling and clang-repl

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Status. Clang-Repl

✤ Clang-repl supersedes examples/clang-interpreter

✤ Submit abstracts on automatic differentiation and interactive C++ for ACAT.

Status. Cling

✤ Continuing to rebase cling on top of llvm13 — we need to split the monorepo commits in our forks llvm.git and clang.git

✤ Worked towards xeus-clad combining clad and xeus-cling conda packages

Status. InterOp

✤ The ctype-based template instantiation is complete. More details in my talk next month.

Status. Clad

✤ Added tutorials about clad under compiler-research.org/tutorials/

✤ [Baidyanath] Hessian support is done. Integrated in ROOT. Working on benchmarks!

✤ [Garima] The error estimation framework is done. Tutorial is underway. The numerical differentiation fallback is complete. A few post-merge improvements are left.

✤ [Parth] Work on automatic cross verification between forward and reverse mode.

Plans

✤ Prepare a paper about the work we've completed.

✤ Enable error recovery for advanced C++ code (eg template instantiation)

✤ Accelerate upstreaming clang patches

✤ Automatically differentiate the CUDA kernels (including computation scheduler)

CaaS Open Projects

* ### Patches against clang.git

  * Implement FileManager uncaching

  * Adapt the user of invalidateCache to its new signature

  * Mark the file entry invalid, until reread

  * Propagate cache flags from LookupFile() to FileManager::getFile()

  * Pass the OpenFile flag also to DirectoryLookup

  * Do not load the source file just to get an irrelevant SourceLoc (ROOT-7111)

  * Allow interfaces to operate on in-memory buffers with no source location info [Pratyush Das]

* Open projects are tracked in our open projects page.

Next Meetings

✤ Monthly Meeting — 6th October, 1700 CET/0800 PDT

✤ Tentative talk schedule:

   ✤ Language Interop Progress, Vassil, Princeton, Oct

   ✤ LLDB, Raphael Isemann, Apple, Nov

If you want to share your knowledge/experience with interactive C++ we can include presentations at an upcoming next meeting

Thank you!