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. Cling

- Upgrade to LLVM13 Complete!
- Relevant (reduced set of) patches are pushed to the llvm.git and clang.git
  - Investigating new approaches to rebase the patches against the LLVM mono repo (J. Hahnfeld)
- Waiting for extra benchmarks, tests and will prepare for a release.
- Started working on reusing the clang-repl infrastructure available in LLVM13 in Cling.
Landed parsing statements on the global scope: D127284!

Jun Zhang started working on upstreaming cling::Value and value printing in clang-repl. Project proposal.

Anubhab Ghosh started working on upstreaming the CUDA and C++ in clang-repl. Project proposal.

Sunho Kim has prepared a patch following the posted RFC. The goal is to provide better stability and robustness which can later cling can reuse.
Status. InterOp

- Cppy now covers all primitive datatypes. Status.
- Not much progress simplifying CallFunc and moving it in libInterOp: PR10850
Status. Clad

- Preparing to release v1.1 including improvements in error estimation, etc.
- Working on moving ROOT’s builtin derivatives to the pullback/pushforward model
Status. Xeus-Clang-Repl

- Builds against vanilla llvm and clang
- Capable or rebuilding to deploy/backport a set of patches (notably [D127284](#))
- Will be able to pick up Clad once v1.1 is released.
Documentation

- LLVM documentation about clang-repl. [Link](#).
- LLVM blog post about the work of our summer contributors. [Blog Link](#).
- Extend Clang to resugar template specialization accesses. [Blog Link](#).
- Recovering from Errors in Clang-Repl and Code Undo. [Blog Link](#).
- Shared Memory Based JITLink Memory Manager. [Blog Link](#).
Upstreaming Patches

- Spreadsheet tracking the progress [here](#).
- Total amount of upstreamed cling patches 26(26+0) out of 52 upstreamable.
CaaS Open Projects

- Open projects are tracked in our open projects page.
Next Meetings

✶ Monthly Meeting — 2nd Feb, 1700 CET/0800 PDT
  ✶ Tentative talk by Sunho Kim on clang-repl and orcv2 jit-link infrastructure

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