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

Interactive C++: cling and clang-repl

Vassil Vassilev

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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.

Status. Clang-Repl

✤ Landed parsing statements on the global scope: <u>D127284</u> !

✤ Jun Zhang started working on upstreaming cling::Value and value printing in clang-repl. <u>Project proposal</u>.

✤ Anubhab Ghosh started working on upstreaming the CUDA and C++ in clang-repl. <u>Project proposal</u>.

✤ Sunho Kim has prepared a patch following the posted <u>RFC</u>.

The goal is to provide better stability and robustness which can later cling can reuse.

Status. InterOp

✤ Cppyy now covers all primitive datatypes. <u>Status</u>.

✤ Not much progress simplifying CallFunc and moving it in libInterOp: <u>PR10850</u>

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. <u>Link</u>.

- LLVM blog post about the work of our summer contributors. <u>Blog Link</u>.

- Extend Clang to resugar template specialization accesses. <u>Blog Link</u>.

- Recovering from Errors in Clang-Repl and Code Undo. <u>Blog Link</u>.

- Shared Memory Based JITLink Memory Manager. <u>Blog Link</u>.

Upstreaming Patches

- ✤ Spreadsheet tracking the progress <u>here</u>.
- ✤ Total amount of upstreamed cling patches 26(26+0) out of 52 upstreamable.

CaaS Open Projects

✤ Open projects are tracked in our <u>open projects page</u>.

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!