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

- Continuing to rebase cling on top of llvm13, working on some related to ROOT jit issues
Working on error recovery for template instantiations
  Landed in LLVM mainline but reverted due to some asan issues - investigating…

Working on adding support for weak symbols: D126781

Working on teaching clang to parse statements on the global scope.
  Design is ready, the CodeGen implementation is left

The goal is to provide a more stable error recovery approach than the currently available on in cling
Status. InterOp

- Working towards supporting the initial cppyy `import cppyy`.
  - Completed
- Working on a full surgery of cppyy where we split it into libInterOp

The goal is to rework the python-to-C++ automatic binding generator cppyy to use LLVM interfaces which can help improving speed and accuracy
Status. Clad

- Added LLVM13 and LLVM14 support
- Working on the tape usage reduction and supporting constructors in forward mode
People

Sara Bellei
GSoD22, PhD in Physics, Politecnico University of Milan, Italy
Improving the Clang-REPL documentation (Jun 2022-Dec 2022)

Rohit Singh Rathaur
GSoD22, Birla Institute of Technology, Mesra, India
Improving Interactive Tool Analysis Documentation for the HSF (Jun 2022-Dec 2022)

Manish Kausik H
GSoC22, Computer Science and Engineering (Dual Degree), Indian Institute of Technology Bhubaneswar
Add Initial Integration of Clad with Enzyme (May 2022-Sep 2022)

Matheus Izvekov
GSoC22, Computer Science
Preserve type sugar for member access on template specializations (May 2022-Sep 2022)
People

Surya Somayyajula
IRIS-HEP Fellow, University of Wisconsin-Madison, USA
Improve Cling’s packaging system: Cling Packaging Tool
(May 2022-Sep 2022)

Sunho Kim
GSOC22, De Anza College, Cupertino, USA
Write JITLink support for a new format/architecture (ELF/AARCH64)
(May 2022-Sep 2022)

Jun Zhang
GSOC22, Anhui Normal University, WuHu, China
Optimize ROOT use of modules for large codebases
(May 2022-Sep 2022)

Anubhab Ghosh
GSOC22, Indian Institute of Information Technology, Kalyani, India
Shared Memory Based JITLink Memory Manager
(May 2022-Sep 2022)
Upstreaming Patches

- Spreadsheet tracking the progress [here](#).
- Reduced 6 patches.
- Working on upstreaming 9 more.
CaaS Open Projects

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

- Monthly Meeting — 7th Jul, 1700 CET/0800 PDT

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