

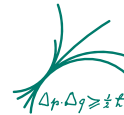
# Julia, Cxx.jl and CERN ROOT

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## History of Cxx.jl-based Julia/ROOT interaction

- ROOT.jl (<https://github.com/JuliaHEP/ROOT.jl>): Loads ROOT libraries and initializes a few basic things. Created in 2014 by Joosep Pata, later maintained by Oliver Schulz, officially registered package for Julia  $\leq$  v0.6, never made to to Julia v1.0.
- ROOTFramework.jl (<https://github.com/JuliaHEP/ROOTFramework.jl>) by O. Schulz, add on package to add some Julia bindings to ROOT, never registered but was used in production in the past
- Past use cases (at least my own): Reading/writing of application-specific ROOT files with custom streamers

## Challenges

- Need to `export JULIA_CXX_RTTI="1"`
- Loading the ROOT libraries from a Julia session used to result in

```
Error in <UnknownClass::InitInterpreter()>: LLVM SYMBOLS ARE EXPOSED TO CLING! This will cause problems; please hide them or dlopen() them after the call to TROOT::InitInterpreter()!
```

```
*** Break *** segmentation violation  
[...]
```

- Past workaround (credit to Joosep Pata): ROOT.jl used to compile a custom Julia binary that load ROOT libraries before starting the Julia session - cumbersome, but worked.
- For details, see <https://github.com/JuliaHEP/ROOT.jl/issues/17>
- *May* be resolved in current Julia versions, but could just be because LLVM versions of Julia v1.3 and ROOT v6.24 are similar, will need to see.

Demos

## Non-C++ Julia/ROOT compatibility

- UpROOT.jl (<https://github.com/JuliaHEP/UpROOT.jl>): Julia binding for Python uproot
- UnROOT.jl (<https://github.com/tamasgal/UnROOT.jl>): Native ROOT file format implementation in Julia by Tamas Gal, work in progress