

SEAL

DATA

INTEGRATION

APPLICATIONS

HC

for

at the

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Origins

- LCG - LHC Computing Grid Project
 - Applications
 - Fabric
 - Grid Deployment
 - Grid Technology
- RTAG - Requirements Technical Assessment Group
- The LCG Applications Architecture Blueprint
 - RTAG identified the need for a "Core Libraries and Services" project

Work Packages

- Foundation and Utility Libraries
- Math Libraries
- Plug-in Manager & Component Model
- Object Dictionary
- Basic Framework Services
- Scripting Services
- Grid Services
- Education and Documentation

Foundation and Utility Libraries

Turn C++ into a higher-level language by standardising a set of implementations of common utilities

hash-table
compression
multi-methods
system abstraction

- Discourage re-inventing the wheel
- Different authors' codes will play well together
- Will adopt much from Boost
- Also from existing LHC experiments' libraries
- See what is needed; evaluate prior art

avoid writing code !

Boost

... free peer-reviewed portable C++ source libraries. The emphasis is on libraries which work well with the C++ Standard Library. One goal is to establish “existing practice” and provide reference implementations so that the Boost libraries are suitable for eventual standardization.

www.boost.org

Math Libraries

- Minuit -> OO/C++
- Evaluation of GSL
- Evaluation of different linear algebra packages (uBLAS, GSL, CLHEP, CBLAS)

Plug-in Manager & Component Model

- Locate and dynamically load program components (platform independent)
- Allow composition of small components to make larger services, in hierarchical fashion.
- Make programs more dynamic.

Object Dictionary

- Simulate introspection in C++
- Essential for persistency framework (POOL)
 - Non-intrusive (for 3rd party code)
 - Parse header files (GCC_XML)
- Assists in development and debugging
- Useful for scripting services

Basic Framework Services

- Message Service (never use cout directly)
 - Redirection/dispatch
 - decoration/annotation
 - filtering
- Options Service
- Name Service

Scripting Services

- Make programs programmable
- Python **CINT**
 - clear, powerful, interactive
 - bindings: component bus
- PyROOT, PyLCGDict, more to follow
- LCGDict "automatically creates bindings"
- Binding technology interoperability

Education and Documentation

- People must be made aware of what SEAL provides, and be encouraged to use it: good dissemination of information is vital.
- Active education (talks, presentations, tutorials); outreach
- Passive education (we must provide high quality documentation)
- Already running a successful Python course

Observations

- Cultural/historical challenges are probably more significant than technical ones
- (... a rose by any other ...)
- However, solutions acceptable to all parties are beginning to emerge
- Must get it right first time (some users want too much too soon)
- Adopt a seal !

Status highlights

- Established POOL dependency on SEAL
- Dictionary maturing rapidly - user feedback
- Scripting technologies interoperability needs more work
- Finalising details of framework structure
- Planning to make 1.0 release this week

THE END

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