

# ROOT Base and SealBase

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- **Pere Mato**
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# Current ROOT & SEAL source structure

ROOT: 761215

176982 cint  
 55953 win32gdk  
 38559 gui  
 36745 base  
 36595 tutorials  
 31592 geom  
 30431 hist  
 27078 matrix  
 20754 test  
 18967 graf  
 12945 tree  
 11714 treeplayer  
 10389 cont  
 10352 table  
 10068 net  
 9970 meta  
 9586 histpainter  
 9501 gpad  
 9318 gl  
 9281 win32  
 8710 proof  
 8084 zip  
 8044 ged  
 7924 qt  
 7743 globusauth  
 7136 g3d  
 7060 clib  
 6616 minuit  
 6578 rpdutils  
 6392 x11

5982 build  
 5235 eg  
 4859 postscript  
 4786 xml  
 4626 winnt  
 4383 treeviewer  
 4355 guibuilder  
 4189 netx  
 4049 utils  
 4043 asimage  
 3989 html  
 3844 physics  
 3393 geompainter  
 3261 roots  
 3146 mlp  
 3104 quadp  
 3082 x3d  
 3011 main  
 3008 unix  
 2977 pyroot  
 2476 venus  
 2286 top\_dir  
 1912 thread  
 1900 rint  
 1771 rootd  
 1692 vms  
 1521 fumili  
 1384 alien  
 1349 pythia  
 1275 clarens

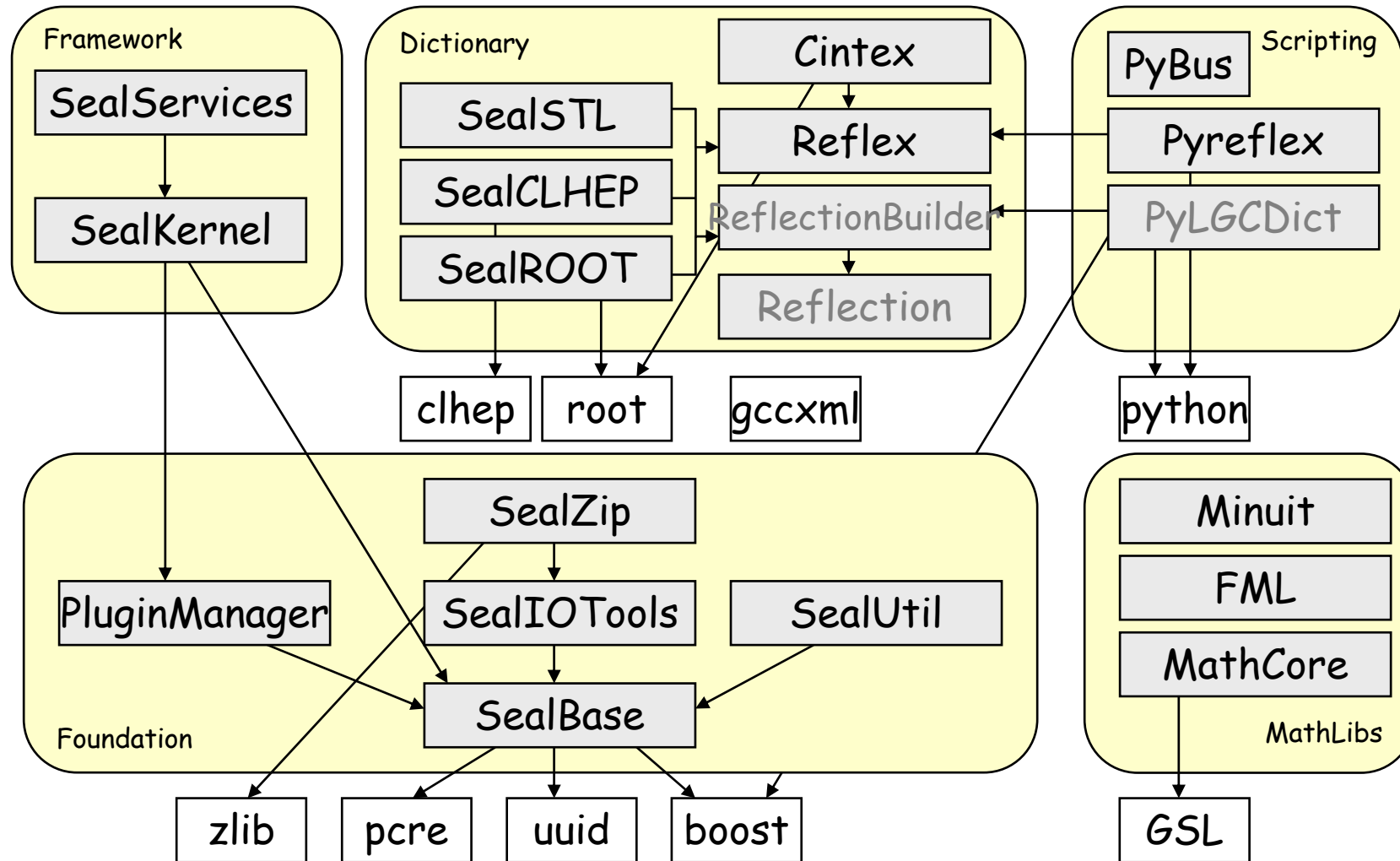
1196 hbook  
 1108 vmc  
 1044 ruby  
 816 krb5auth  
 793 newdelete  
 770 pythia6  
 700 rootx  
 669 ldap  
 620 sapdb  
 599 proofd  
 598 srputils  
 593 rfio  
 579 peac  
 558 config  
 463 metautils  
 451 dcache  
 377 mysql  
 369 pgsq  
 310 x11tff  
 224 chirp  
 172 macros  
 147 gedold  
 104 qtroot

SEAL 112241

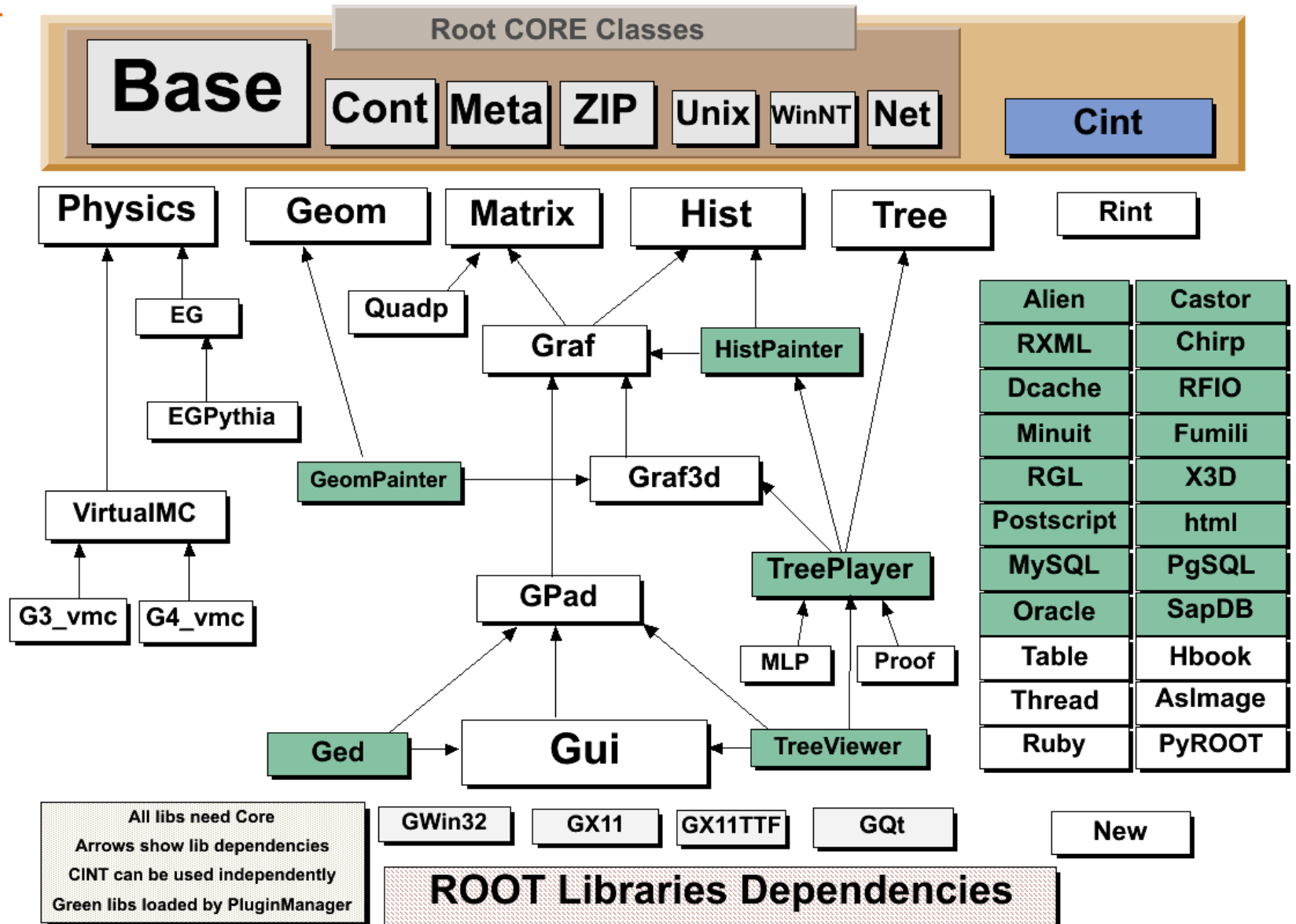
44861 Foundation  
 22788 Dictionary  
 19240 MathLibs  
 17249 Scripting  
 5109 Framework  
 1800 Extensions  
 716 config

28828 SealBase  
 7807 SealZip  
 3555 SealIOTools  
 3202 PluginManager  
 836 SealUtil  
 267 SealPlatform  
 163 PluginChecker  
 69 PluginDumper  
 62 SealTest  
 38 PluginRefresh  
 34 PluginCaps  
 8598 Reflex  
 3374 Reflection  
 3134 DictionaryGenerator  
 2854 ReflectionBuilder  
 2146 CMSEexamples  
 1977 Cintex  
 463 SealROOT  
 140 SealCLHEP  
 73 SealSTL  
 29 SealDict  
 9450 Minuit  
 6389 FML  
 3005 MathCore  
 4752 Pyreflex  
 4513 PyLCGDict2  
 3137 PyBus  
 2564 PyROOT  
 2283 PyLCGDict  
 2954 SealKernel  
 2155 SealServices

# SEAL packages and dependencies (1.6.0)



# Current ROOT structure & libs



# BASE: infrastructure

Fons.Rademakers, Philippe.Canal, Pere.Mato, Bertrand.Bellenot,  
Ilka.Antcheva, Jose.Lo, Axel.Naumann, Rene.Brun

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598 srputils  
593 rfio  
579 peac  
558 **config**  
463 metautils  
451 dcache  
377 mysql  
369 pgsq  
310 x11tff  
224 chirp  
172 **macros**  
147 gedold  
104 qtroot

44861 **Foundation**  
22788 Dictionary  
19240 MathLibs  
17249 Scripting  
5109 **Framework**  
1800 Extensions  
716 config

System and OS classes

Plug-in Manager

Configuration

Build

Releases

General utilities

CVS management

Documentation

# Merging SealBase with ROOT

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- Make an inventory of what exists in SealBase and not in ROOT
- Port/add missing features to ROOT
- Provide a migration guide to help people migrate to ROOT base classes

# SealBase

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- SealBase provides about 80 classes that provide basic infrastructure functionality:
  - a set of classes encapsulating and abstracting OS and libc concepts and functions
    - file system, pipe, socket, inet addresses, system info, user info, process info, shared library handling, i/o multiplexing, error handling, time, memory mapped files, signal handling, logging, etc.
  - a set of utility classes:
    - timestamps, bit handling, regexps, string operations, tasks, callbacks, uids, etc.

# ROOT Base

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- ROOT provides basically the same functionality in a much smaller number of classes
- The main OS abstraction is via the TSystem class, which has two concrete implementations:
  - TUnixSystem
  - TWinNTSystem
- Most OS access goes via direct calls to TSystem (not via intermediate abstraction classes)
- Some higher level OS concepts are provided via their own classes, like sockets, multiplexers, timestamps, etc, but internally they all call TSystem
- In addition we also have a large set of utility classes for concepts like uuids, signal/slots, strings, regexps, tasks, white board, bit handling, etc.



# Plugin Manager

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- The ROOT plugin manager is a full featured plugin manager supporting the loading of shared libraries and plugins based on configuration information specified in the different rootrc files
  - Unloading is more difficult due to the CINT dictionary information available in the plugins
- The plugin entry function is also specified in the rootrc files and is called via CINT, making it very flexible
- The SEAL plugin manager does not seem to provide any additional functionality.

# Plugin Dependency Handling

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- Dependencies between plugins are described in the “rootmap” file
  - This rootmap file is generated via the Makefile
- The plugin manager uses this information to load all dependent plugins before loading the plugin itself
- The rootmap file also contains a mapping between classes and libraries and is used by CINT and ACLiC to load the correct plugin(s) when the user wants to use a certain class
  - The user does not have to know by which plugin a certain class is implemented

# The system.rootmap file

Class name

Shared lib where is the class and its dependencies

```
Library.TPerfStats: libProof.dll libTree.dll libGraf3d.dll libGraf.dll libHist.dll libTreePlayer.dll
Library.TPerfEvent: libProof.dll libTree.dll libGraf3d.dll libGraf.dll libHist.dll libTreePlayer.dll
Library.TStatus: libProof.dll libTree.dll libGraf3d.dll libGraf.dll libHist.dll libTreePlayer.dll
Library.TProofVarArray: libProof.dll libTree.dll libGraf3d.dll libGraf.dll libHist.dll libTreePlayer.dll
Library.TProofProgressDialog: libProofGui.dll libProof.dll libGui.dll
Library.TLorentzVector: libPhysics.dll libMatrix.dll
Library.TLorentzRotation: libPhysics.dll libMatrix.dll
Library.TVector3: libPhysics.dll libMatrix.dll
Library.TVector2: libPhysics.dll libMatrix.dll
Library.TRotation: libPhysics.dll libMatrix.dll
Library.TGenPhaseSpace: libPhysics.dll libMatrix.dll
Library.TFeldmanCousins: libPhysics.dll libMatrix.dll
Library.TRobustEstimator: libPhysics.dll libMatrix.dll
Library.TRolke: libPhysics.dll libMatrix.dll
Library.TPostScript: libPostscript.dll libGraf.dll
Library.TSVG: libPostscript.dll libGraf.dll
Library.TPDF: libPostscript.dll libGraf.dll
Library.TRint: libRint.dll
Library.TTabCom: libRint.dll
Library.THtml: libHtml.dll libGraf.dll
Library.THtml@@TParseStack: libHtml.dll libGraf.dll
Library.THtml@@TParseStack@TParseElement: libHtml.dll libGraf.dll
Library.THtml@@TDocElement: libHtml.dll libGraf.dll
Library.THtml@@TLocalType: libHtml.dll libGraf.dll
Library.TParticle: libEG.dll libGraf3d.dll libGraf.dll
Library.TAttParticle: libEG.dll libGraf3d.dll libGraf.dll
Library.TPrimary: libEG.dll libGraf3d.dll libGraf.dll
Library.TGenerator: libEG.dll libGraf3d.dll libGraf.dll
Library.TDatabasePDG: libEG.dll libGraf3d.dll libGraf.dll
Library.TParticlePDG: libEG.dll libGraf3d.dll libGraf.dll
Library.TDecayChannel: libEG.dll libGraf3d.dll libGraf.dll
Library.TParticleClassPDG: libEG.dll libGraf3d.dll libGraf.dll
Library.TGeoAtt: libGeom.dll
Library.TGeoBoolNode: libGeom.dll
Library.TGeoUnion: libGeom.dll
Library.TGeoIntersection: libGeom.dll
```

# ACLiC

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The “Automatic Compiler of Libraries for Cint” implements support for:

`.L mymacro.C+`

- Needs to be updated to properly support for MacOS’s library idiosyncrasies
  - Probably requires introduction of support for autotools’ .la meta shared libraries files
- Extended support more flexibility in the location of the generated library
- Enhance compilation speed for result of MakeClass/MakeSelector/MakeProxy

# AutoDocumentation

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- Reimplementation of THtml to remove existing limitations
- New HTML presentation layer with more functionality
- Save/retrieve documentation in a ROOT file
- Documentation available in ROOT session

# User's Guide

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- User's Guide is following ROOT production versions
  - Current - "User's Guide v4.0/08"
- New version in June/July
  - New chapter "Linear Algebra"
  - Chapters for updating:
    - "Getting Started"
    - "Graphics and Graphical User Interface"
- New chapters will be introduced: Mathlib, PROOF, ...