



Code Documentation Luis Mancera

LCG Software Process & Infrastructure (CERN, 10/23/02)

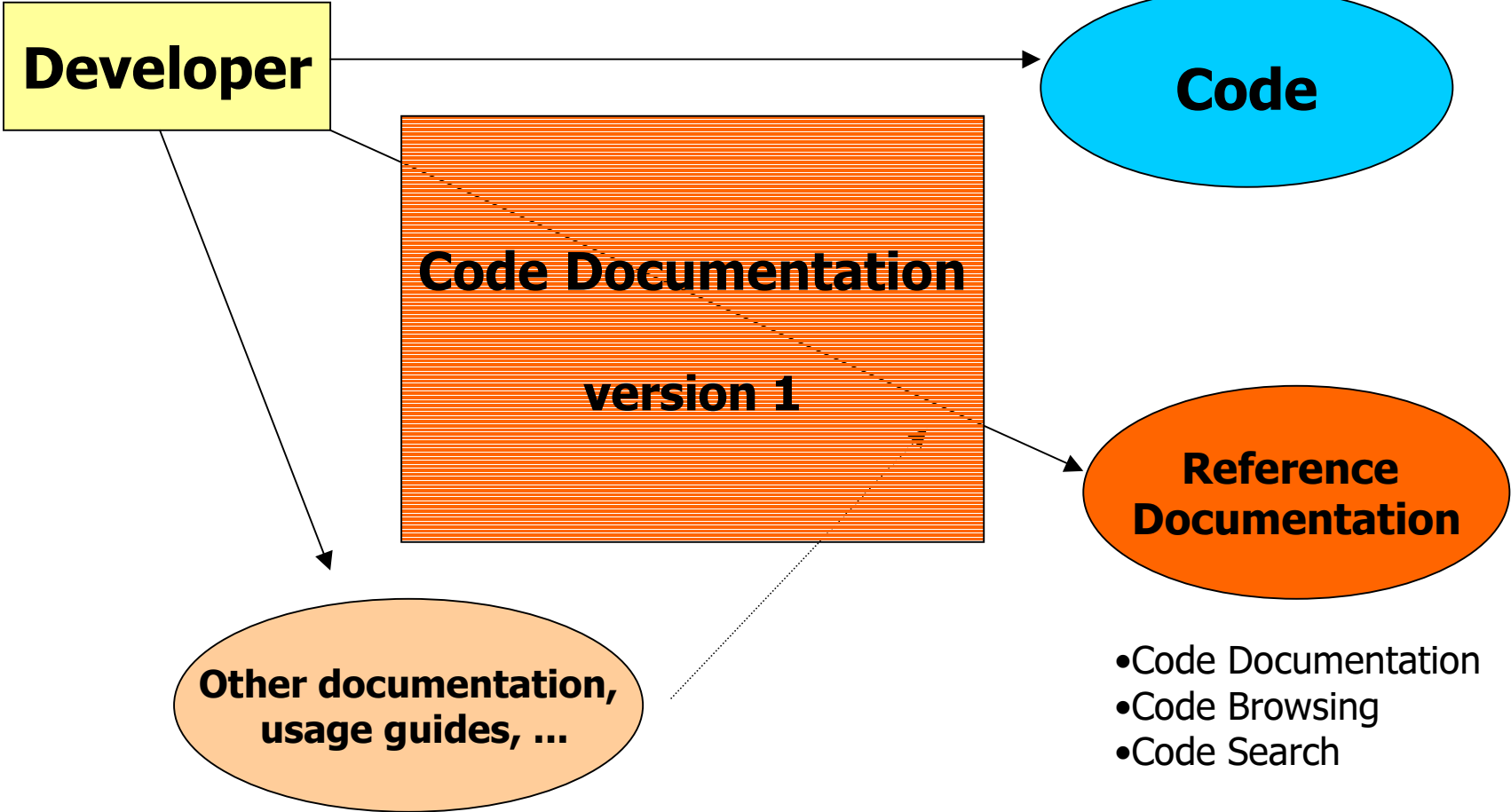
Description of the Component



- Analyze different Code Documentation Systems
- Decide what and how is going to be used
- Features of interest:
 - Code browsing
 - Code searching
 - Code information
 - Design diagrams
- Work in collaboration with HEP experiments and projects



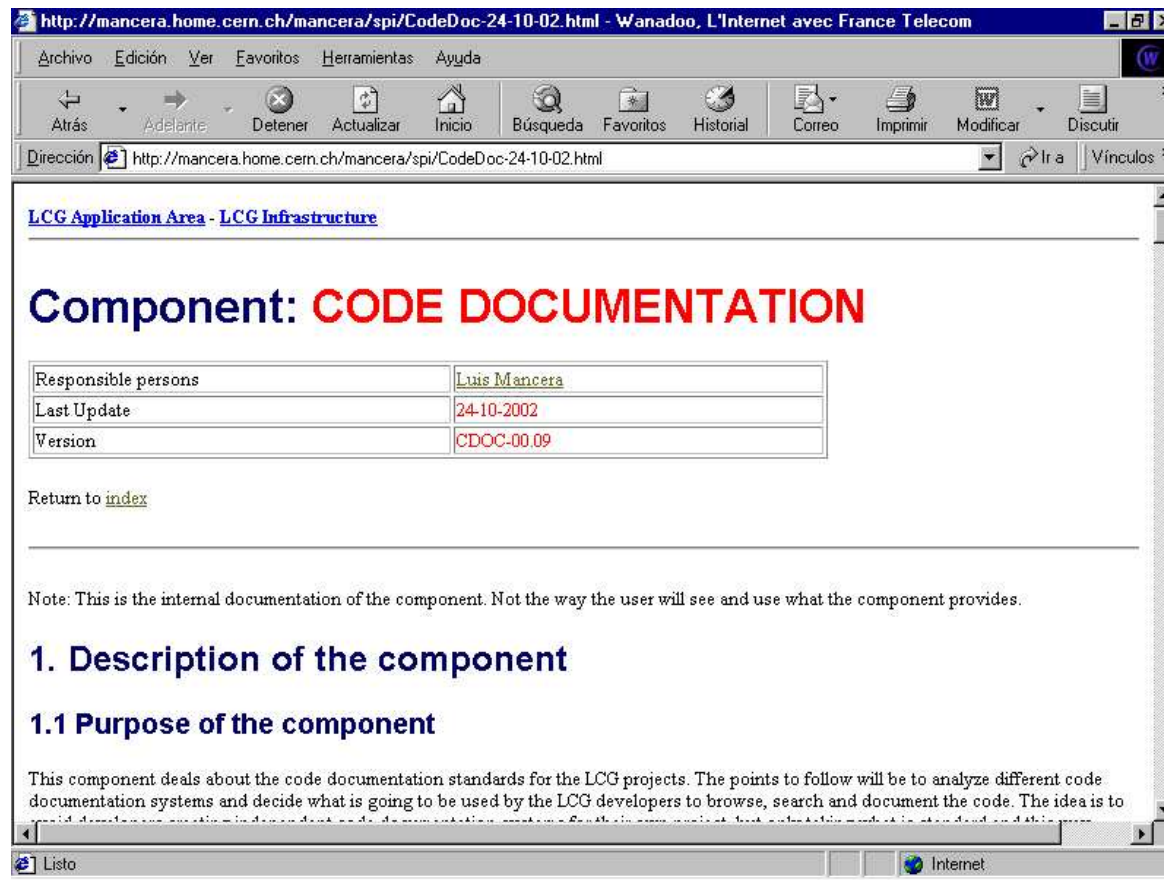
Code Documentation:



Component Documentation



- All information about the component
 - <http://cern.ch/mancera/spi>



Main steps followed



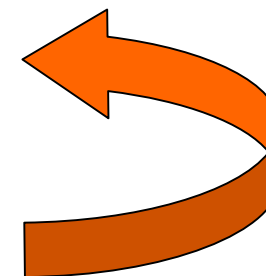
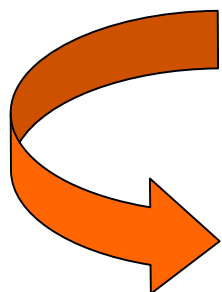
- Technology survey
 - Web Survey
 - ALiCE, ATLAS, CMS, LHCb, LHC++, Anaphe, ROOT, Monarc, Geant 4, BaBar, Coral
 - Also surveyed some not-CERN projects
 - Main products found: Doxygen, ViewCVS, CVSweb, LXR, Internal ones,...
 - Other products: DOC++, Doc-o-matic, winCVS, Ignominy, some comercial ones...
 - Contact HEP projects and experiments
 - Gabriele Cosmo (Geant 4):
 - Use LXR, Recommend Doxygen and CVS browsers
 - Nick Sinanis (CMS):
 - Use and recommend LXR, Doxygen and ViewCVS
 - Benigno Gobbo (Coral):
 - Use and recommend Doxygen



Main steps followed (II)



- Choose products to use
- Install and create documentation
- Wait feedback from LCG projects



CVS Browsing: ViewCVS (I)



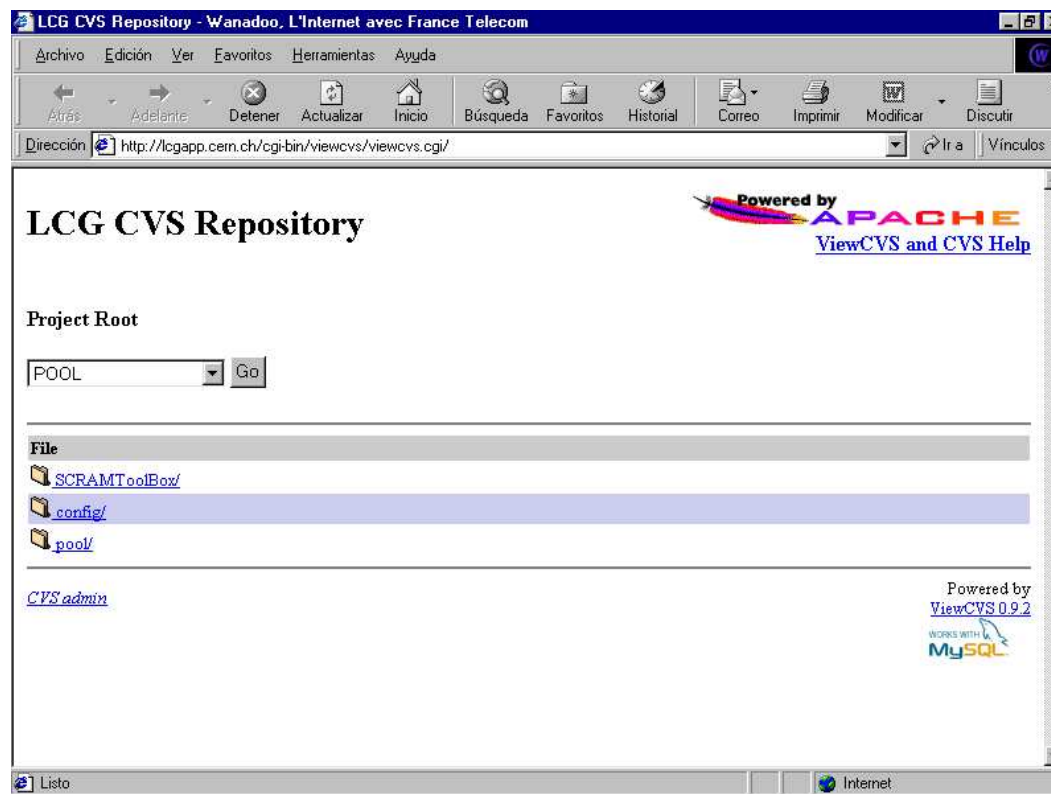
- Browse directories, change logs, and specific revisions of files.
 - Complete interaction with CVS
 - Compared to CVSweb:
 - Easy to configure, less bugs, more features, better implemented, tarball generation
 - Widely used:
 - ATLAS, ALICE, CMS, Sourceforge,...
 - Recommended by the people contacted
 - Nick Sinanis (CMS)



CVS browsing: ViewCVS (II)



- ViewCVS 0.9.2 installed at lcgapp:
 - <http://lcgapp.cern.ch/cgi-bin/viewcvs/viewcvs.cgi/>



CVS browsing: ViewCVS (III)



- Additional features installed by now:
 - CVSgraph 1.3.0: Displays the tree of revisions and branches graphically
 - Enscript 1.6.1: Colorize files in the CVS repository.

The screenshot displays two browser windows. The left window shows the source code for `pool/PersistencySvc/src/DataTransform.cpp` at revision 1.4. The right window shows the revision graph for `pool/PersistencySvc/src/ConversionSvc.cpp`. The graph shows a main branch with revisions 1.1 through 1.5, and a branch labeled 'overload' with revision 1.1.1. The graph also shows a branch labeled 'areRelease' with revision 1.1.1.1. The source code in the left window includes headers and a namespace definition for 'pool'.

```
#include "pool/poolDb.h"
#include "pool/Gui.h"
#include "pool/DataCallBack.h"
#include "pool/DataTransform.h"
#include "pool/DbTypeInfo.h"
#include "reflect/Class.h"
#include <iostream>
#include <algorithm>
#include <map>

namespace pool {
    const std::string typeName(const std::type_info& typ);
}

typedef std::map<pool::Gui, pool::DataCallBack* > Conversions;
typedef std::vector<const pool::DbTypeInfo* > ShapeVector;
typedef std::map<pool::Gui, ShapeVector > Shapes;

namespace ( // Don't clutter global namespace
    class RegInfo {
    public:
        pool::Gui defGui;
        const pool::ObjectType* defType;
        const pool::DbTypeInfo* defShape;
    };
};
```



X ref. and searching: LXR (I)



- Cross-Referencing Code
 - General hypertext cross-referencing tool
 - Powerful search tool
 - Requires no code changes
 - Easy to manage and launch
 - Widely used
 - ATLAS, CMS, Anaphe, GNOME
 - Recommended by the people contacted
 - Gabriele Cosmo (Geant4), Nick Sinanis (CMS)



X ref. and searching : LXR (II)



- Open issues:
 - Could be slow to update when the projects become big ones ☹️
 - It needs its own separate copy of the code ☹️
 - Bad documentation ☹️
 - Maybe not needed if Doxygen can give us all LXR functionality



X ref. and searching: LXR (III)



- LXR 0.3 installed at:
 - <http://lcgapp.cern.ch/lxr/source>

The screenshot shows two browser windows. The left window displays the source code for `MethodBuilder.cpp` in the `POOL_0_1_0/ReflectionBuilder/src/` directory. The right window shows the LXR search results for the term `int`. The search results page includes a search bar with the term `int` and a search button. Below the search bar, it indicates "Too many hits, displaying first 1000" and lists several matches from the `Geant 4.4.0/Configure` file, such as `line 140`, `line 378`, `line 385`, `line 388`, `line 391`, `line 400`, `line 493`, `line 506`, `line 758`, `line 761`, `line 970`, `line 971`, `line 1124`, and `line 1128`.



Code Doc: Doxygen (I)



- Documentation system for C++, C, Java, IDL and PHP.
- Generates on-line documentation browser (html)
- Generates off-line reference manual (latex)
- Other output formats: RTF, Postscript, PDF, compressed HTML, Unix man pages



Code doc: Doxygen (II)



- Complete: Code browsing (cross referenced), code reference, search, code structure, diagrams,...
- Flexible
- Well documented
- It can be use to create normal documentation (.dox)
 - Adds every .dox file under <project>/doc
- Widely used
 - CMS, Anaphe, BaBar, Coral, ...
- Recommended by the people contacted
 - Gabriele Cosmo (Geant4), Nick Sinanis (CMS), Benigno Gobbo (Coral)



Code doc: Doxygen (III)



- Common doxygen 1.2.18 area created at lcgapp:
 - <http://lcgapp.cern.ch/doxygen/>

The screenshot displays two browser windows. The left window, titled 'DataCache.cpp Source File - Wanadoo, L'Internet avec France Telecom', shows the source code for 'DataCache.cpp'. The code includes a preprocessor directive for 'POOL_OBJECTCACHE_CPP 1', an include for 'DataCache.h', and a static pointer 'theCache'. It defines a 'getCache()' method that returns 'theCache' and a 'deleteCache()' method that sets 'theCache' to 0.

```
00001 #define POOL_OBJECTCACHE_CPP 1
00002
00003 #include "DataCache.h"
00004
00005 /// Initialize static pointer
00006 //pool::CacheTable* pool::DataCache::theCache = 0;
00007
00008 /// Method to retrieve the (single) Cache instance
00009 pool::CacheTable* pool::DataCache::getCache() {
00010     //if(!theCache) {
00011         // theCache = new CacheTable();
00012         CacheTable* theCache = new CacheTable();
00013     //}
00014     return theCache;
00015 }
00016
00017 /// Method to delete the Cache instance
00018 //void pool::DataCache::deleteCache() {
00019 // delete theCache;
00020 // theCache = 0;
00021 //}
00022
```

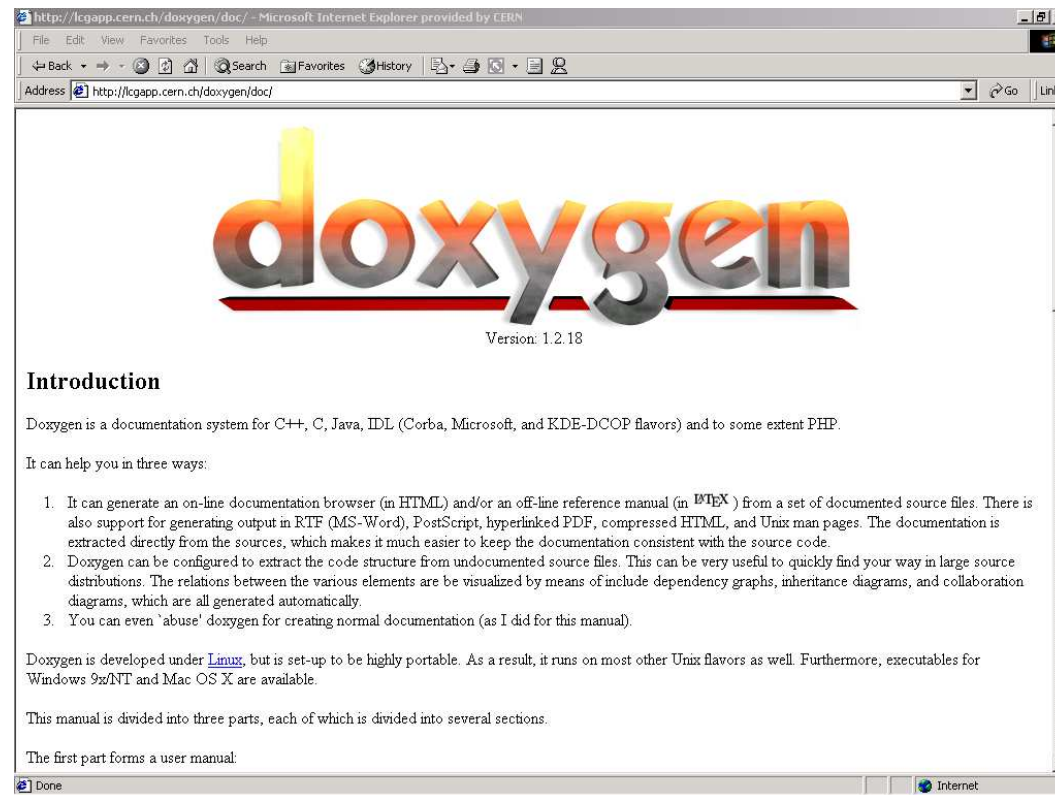
The right window, titled 'Main Page - Wanadoo, L'Internet avec France Telecom', shows the generated HTML documentation for 'POOL Documentation 0_1_0'. It includes a navigation menu with links like 'Main Page', 'Packages', 'Namespace List', 'Class Hierarchy', 'Alphabetical List', 'Compound List', 'File List', 'Namespace Members', and 'Compound Members'. The footer of the documentation states: 'Generated at Mon Oct 21 10:09:20 2002 for POOL by doxygen 1.2.8.1 written by Dimitri van Heesch, © 1997-2001'.



Code doc: Doxygen (IV)



- doxygen 1.2.18 documentation placed lcgapp:
 - <http://lcgapp.cern.ch/doxygen/doc/>



To do



- Finalize ViewCVS features installation
- Include Doxygen search functionality
- Move into a fully automatic update system for LXR and Doxygen
- Create good user documentation
- Interacting with POOL for review and changes
- Component in production soon

