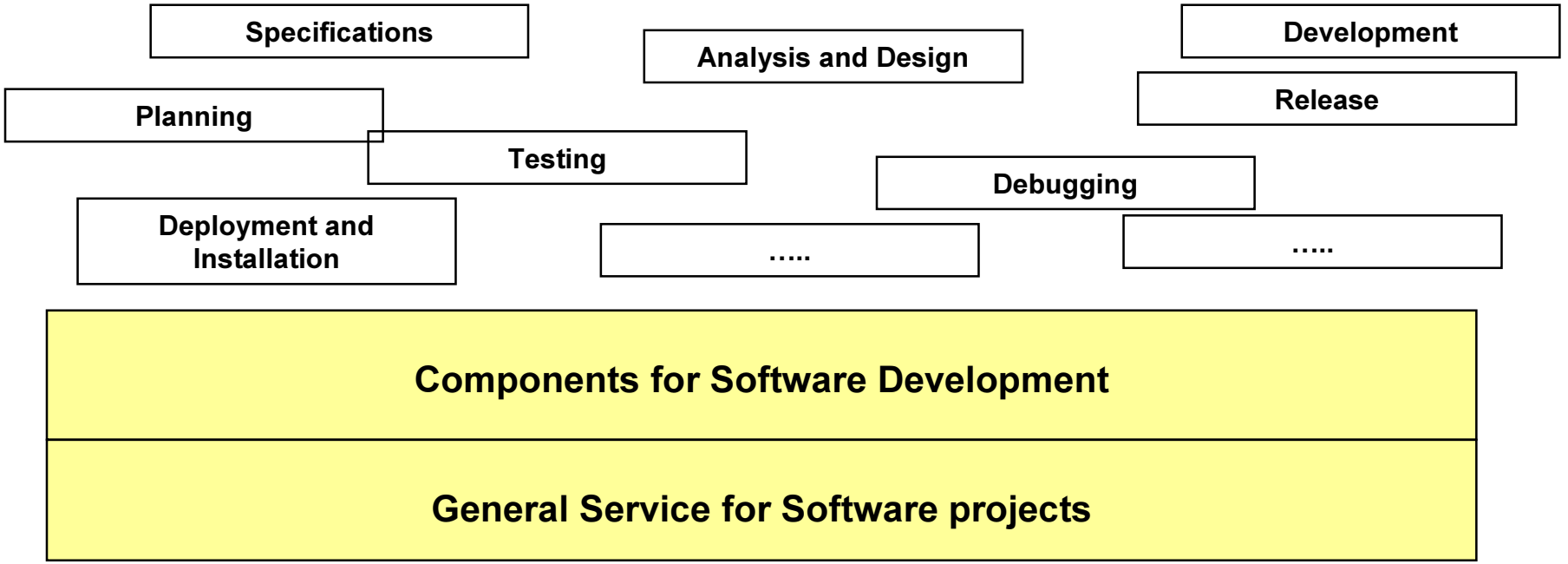
LCG Infrastructure for Software Projects

Overview

A.Aimar IT/API
CERN

Infrastructure for Software Development



a. Provide general services needed by each project
   - CVS repository, Web Site, Software Library
   - Mailing Lists, Bug Reports, Collaborative Facilities

b. Provide components specific to the software phases
   - Tools, Templates, Training, Examples, etc.

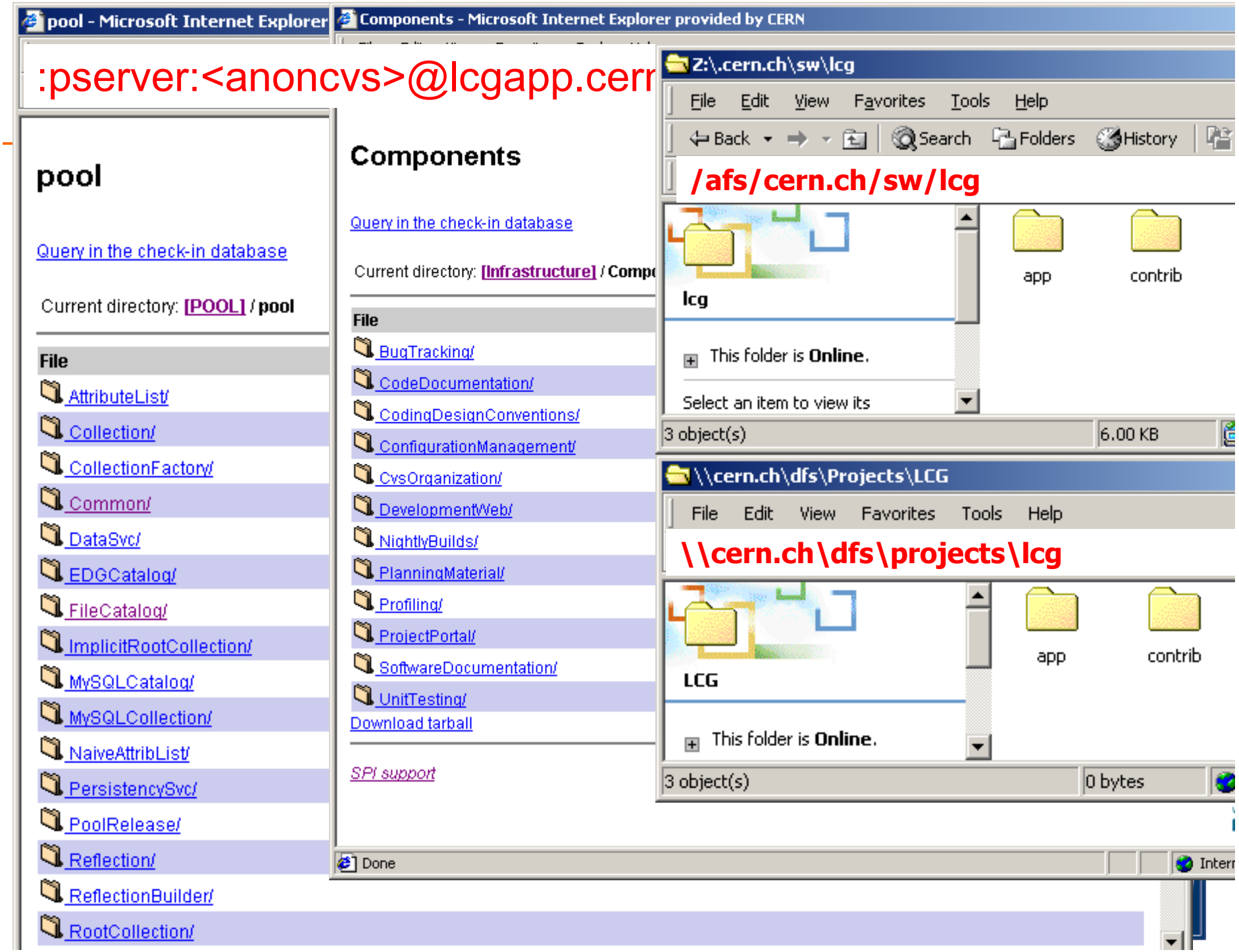
SPI Services
CVS repository and Delivery Areas

CVS repository

- A central CVS repository managed and available to all projects
- Any project just needs to ask for it, and declare its users permissions
- Managing mirroring and backups
- Users access controlled
- Tools for automatic clean up of locks, etc
- Systems to browse the repositories

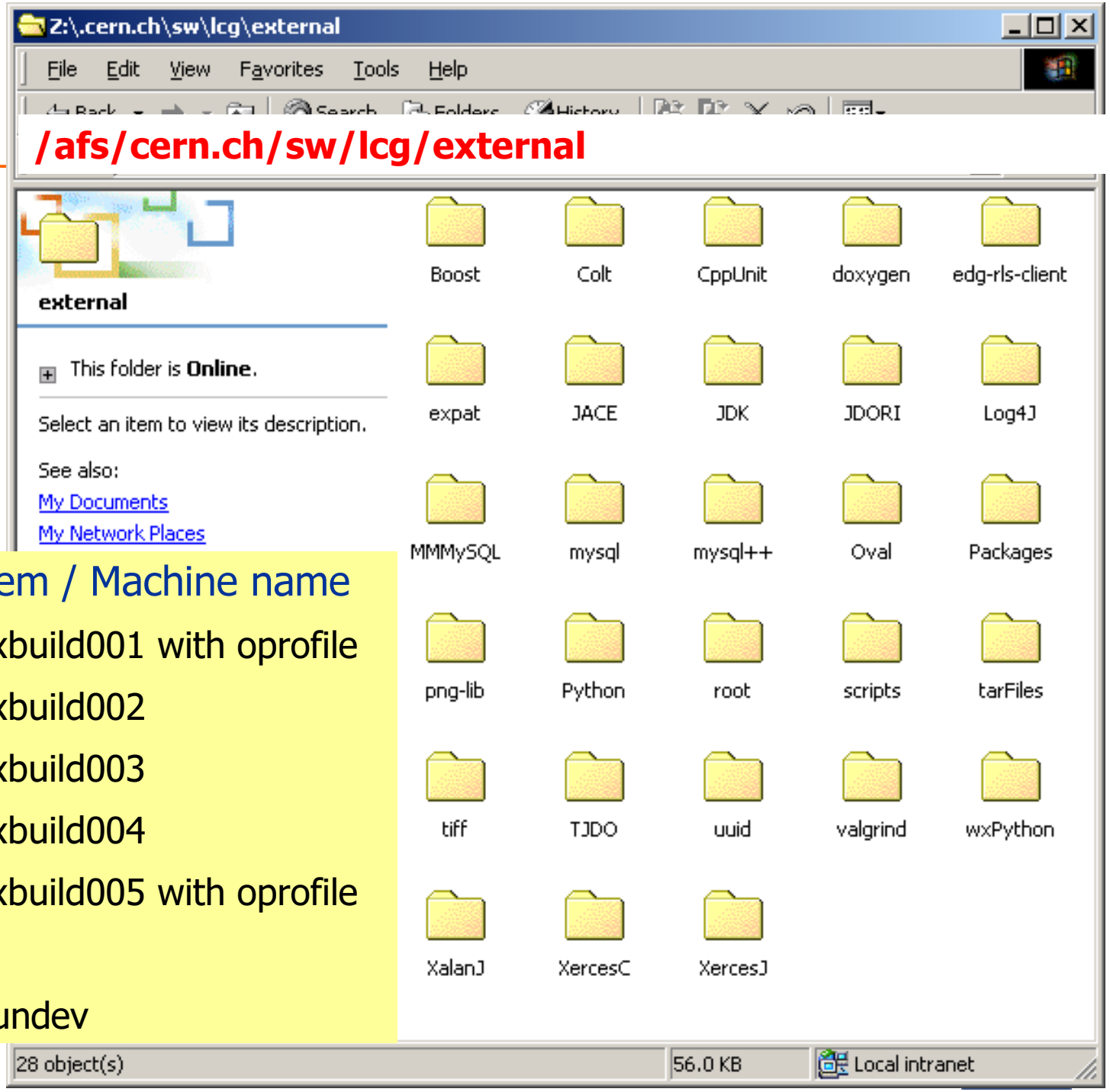
Delivery areas

- The AFS and DFS delivery areas
  1. an area to install software created by projects in the LCG application area
  2. an area where external and third party software
  3. an area where software is installed which is provided by people for evaluation within a project
- Pre-installed software shall be in directories specifying the package name, the package version and the "OS_Compiler"


pool - Microsoft Internet Explorer
:pserver:<anoncvs>@lcgapp.cern
pool
Query in the check-in database
Current directory: [POOL] / pool
File
AttributeList/
Collection/
CollectionFactory/
Common/
DataSvc/
EDGCatalog/
FileCatalog/
ImplicitRootCollection/
MySQLCatalog/
MySQLCollection/
NaiveAttribList/
PersistencySvc/
PoolRelease/
Reflection/
ReflectionBuilder/
RootCollection/
Components - Microsoft Internet Explorer provided by CERN
Components
Query in the check-in database
Current directory: [Infrastructure] / Compo
File
BugTracking/
CodeDocumentation/
CodingDesignConventions/
ConfigurationManagement/
CvsOrganization/
DevelopmentWeb/
NightlyBuilds/
PlanningMaterial/
Profiling/
ProjectPortal/
SoftwareDocumentation/
UnitTesting/
Download tarball
SPI support
Done
Z:\.cern.ch\sw\lcg
File Edit View Favorites Tools Help
Back Search Folders History
/afs/cern.ch/sw/lcg
lcg
This folder is Online.
Select an item to view its
app
contrib
3 object(s)
6.00 KB
\\cern.ch\dfs\Projects\LCG
File Edit View Favorites Tools Help
\\cern.ch\dfs\projects\lcg
LCG
This folder is Online.
app
contrib
3 object(s)
0 bytes

SPI Services
Build systems and Software Library

- Presently the build servers are publicly available, so everybody can login using their AFS account
- Window 2000 and Windows XP are needed too. Currently not available yet.
- All software needed by more than one LCG projects shall be installed in common areas
- Available for several compilers and operating systems
- Maintained centrally with support and help to the user
- External documentation available
- Contact with the authors if the software is developed in HEP or LCG
- Distribution and pre-installation to all LCG and HEP users



- Operating system / Machine name
  - RedHat 6.1 lxbuild001 with oprofile
  - RedHat 6.1 lxbuild002
  - RedHat 7.2 lxbuild003
  - RedHat 7.2 lxbuild004
  - RedHat 7.2 lxbuild005 with oprofile
  - RedHat 7.3
  - Solaris-7 sundev

SPI Services
Bug Tracker and Project Portal

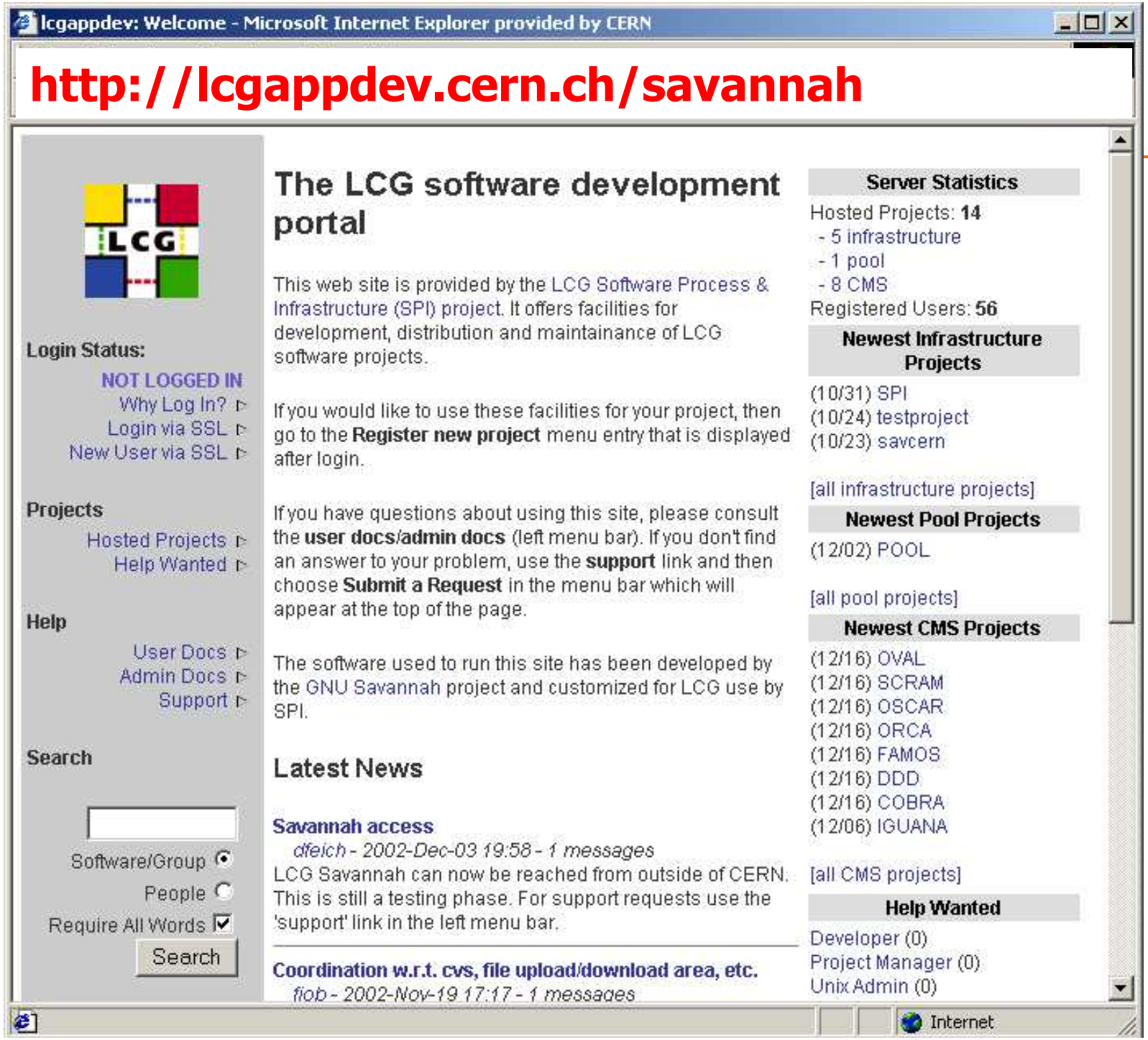
Project Portal

- The development front-end of every project
- With all features needed, configured and integrated
  - News and Fans
  - Task management
  - Mailing lists access
  - Bug tracking access
  - Download area
  - Access to the CVS repository
- Users can contact the project or also become developers
- We have customized Savannah that is the one from GNU

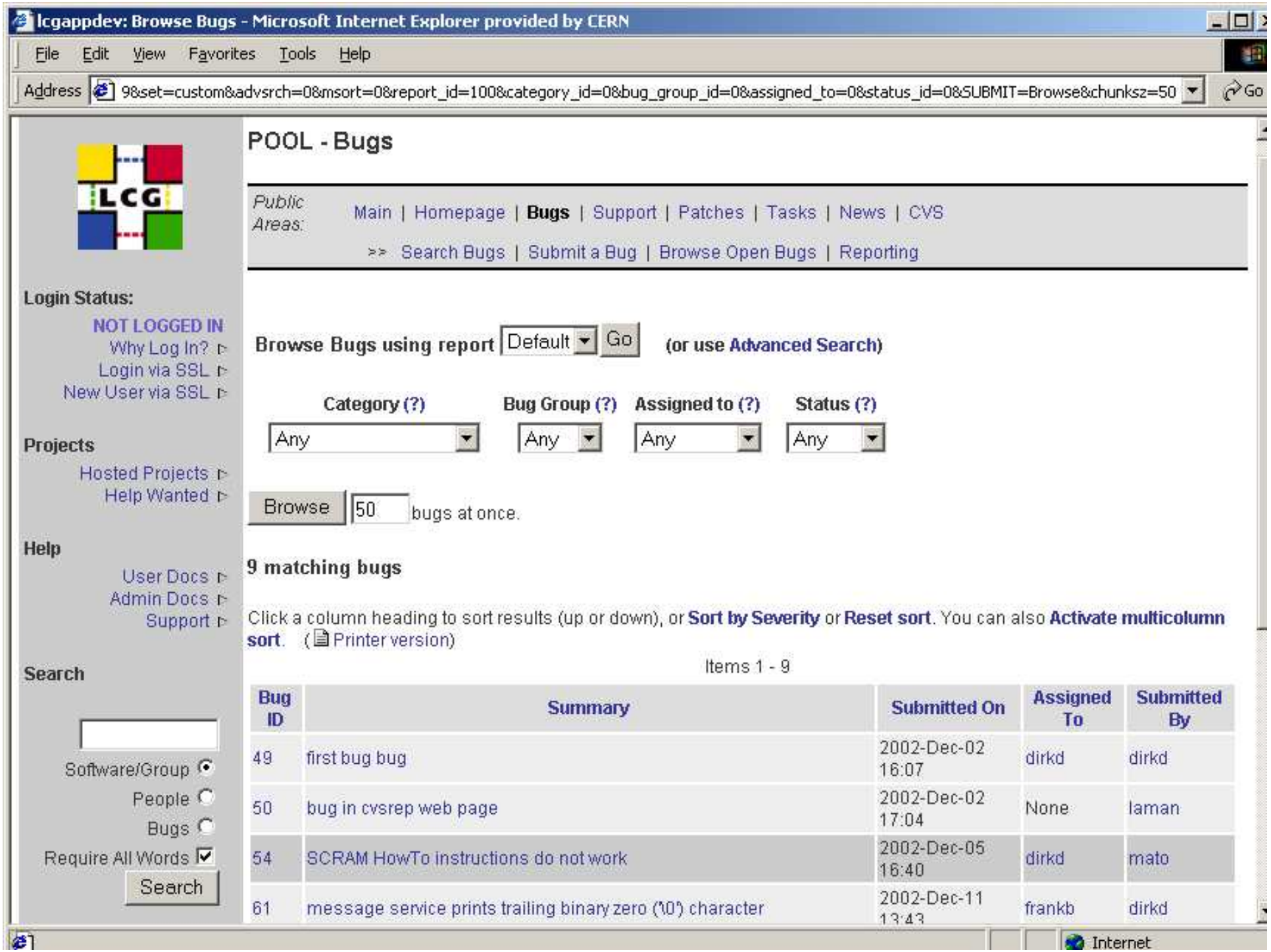
Bug Tracker

- A central installation so that each project has an available bug tracker system
- Centrally managed but customizable for different needs
- Easier to post bug if projects use similar systems
- No work of maintenance and upgrade on the projects
- Web based

http://lcgappdev.cern.ch
(for a few test projects)


lcgappdev: Welcome - Microsoft Internet Explorer provided by CERN
http://lcgappdev.cern.ch/savannah
Login Status:
NOT LOGGED IN
Why Log In?
Login via SSL
New User via SSL
Projects
Hosted Projects
Help Wanted
Help
User Docs
Admin Docs
Support
Search
Software/Group
People
Require All Words
Search
The LCG software development portal
This web site is provided by the LCG Software Process & Infrastructure (SPI) project. It offers facilities for development, distribution and maintainance of LCG software projects.
If you would like to use these facilities for your project, then go to the Register new project menu entry that is displayed after login.
If you have questions about using this site, please consult the user docs/admin docs (left menu bar). If you don't find an answer to your problem, use the support link and then choose Submit a Request in the menu bar which will appear at the top of the page.
The software used to run this site has been developed by the GNU Savannah project and customized for LCG use by SPI.
Latest News
Savannah access
dfeich - 2002-Dec-03 19:58 - 1 messages
LCG Savannah can now be reached from outside of CERN. This is still a testing phase. For support requests use the 'support' link in the left menu bar.
Coordination w.r.t. cvs, file upload/download area, etc.
fiob - 2002-Nov-19 17:17 - 1 messages
Server Statistics
Hosted Projects: 14
- 5 infrastructure
- 1 pool
- 8 CMS
Registered Users: 56
Newest Infrastructure Projects
(10/31) SPI
(10/24) testproject
(10/23) savcern
[all infrastructure projects]
Newest Pool Projects
(12/02) POOL
[all pool projects]
Newest CMS Projects
(12/16) OVAL
(12/16) SCRAM
(12/16) OSCAR
(12/16) ORCA
(12/16) FAMOS
(12/16) DDD
(12/16) COBRA
(12/06) IGUANA
[all CMS projects]
Help Wanted
Developer (0)
Project Manager (0)
Unix Admin (0)
Internet

lcgappdev: Project Info - POOL - Microsoft Internet Explorer provided by CERN
File Edit View Favorites Tools Help
Address http://lcgappdev.cern.ch/savannah/projects/pool/
Go
LCG
Login Status:
NOT LOGGED IN
Why Log In?
Login via SSL
New User via SSL
Projects
Hosted Projects
Help Wanted
Help
User Docs
Admin Docs
Support
Search
Software/Group
People
Require All Words
Search
POOL - Summary
Public Areas:
Main | Homepage | Bugs | Support | Patches | Tasks | News | CVS
Project Type: POOL projects
Persistency Framework
License: GNU Lesser General Public License
Registration Date: Dec 02, 2002
Development Status: 4 - Beta
Developer Info
Project Admins:
dirkd
Developers:
11 [View Members]
Group id:
9
Public Areas
Project Homepage
Bug Tracking (1 open bugs, 9 total)
Tech Support Manager (0 open requests, 0 total)
Patch Manager (0 open patches, 0 total)
Latest News
Savannah Project Portal
dfeich - 2002-Dec-03 14:13 - 0 messages
The download area is not yet set up for your project (the viewCVS access is ok, though). You can look at a complete project setup if you select the 'savcern' project in the hosted projects list. This is also where you should submit bugs and support requests for problems with the interface.
[Submit News]
[1 News in Archives]
Done
Internet

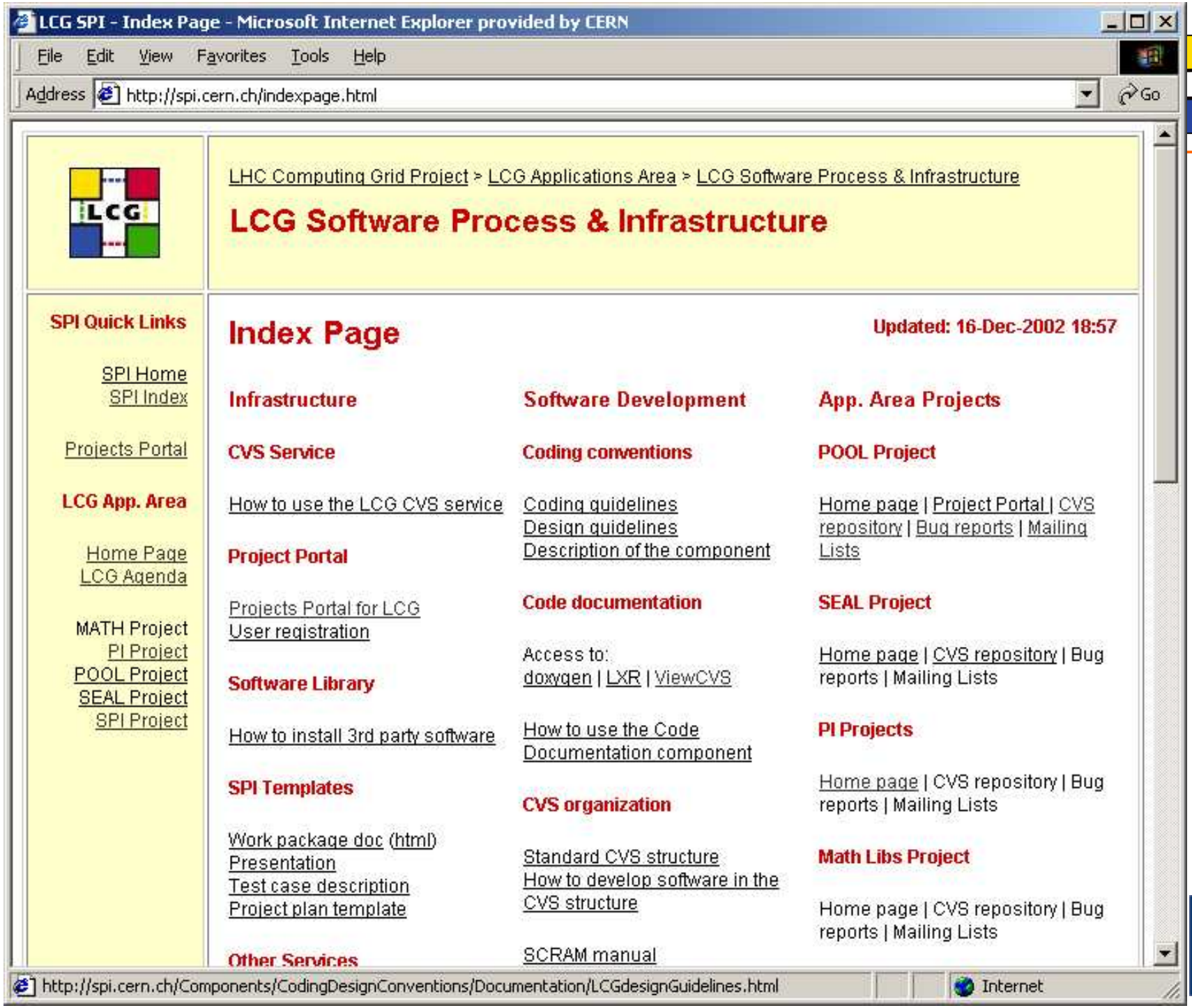

lcgappdev: Browse Bugs - Microsoft Internet Explorer provided by CERN
File Edit View Favorites Tools Help
Address 9&set=custom&advsrch=0&msort=0&report_id=100&category_id=0&bug_group_id=0&assigned_to=0&status_id=0&SUBMIT=Browse&chunksz=50
Go
LCG
Login Status:
NOT LOGGED IN
Why Log In?
Login via SSL
New User via SSL
Projects
Hosted Projects
Help Wanted
Help
User Docs
Admin Docs
Support
Search
Software/Group
People
Bugs
Require All Words
Search
POOL - Bugs
Public Areas:
Main | Homepage | Bugs | Support | Patches | Tasks | News | CVS
>> Search Bugs | Submit a Bug | Browse Open Bugs | Reporting
Browse Bugs using report Default Go (or use Advanced Search)
Category (?)
Bug Group (?)
Assigned to (?)
Status (?)
Any
Any
Any
Any
Browse 50 bugs at once.
9 matching bugs
Click a column heading to sort results (up or down), or Sort by Severity or Reset sort. You can also Activate multicolumn sort. (Printer version)
Items 1 - 9
Bug ID
Summary
Submitted On
Assigned To
Submitted By
49 first bug bug 2002-Dec-02 16:07 dirkd dirkd
50 bug in cvsrep web page 2002-Dec-02 17:04 None laman
54 SCRAM HowTo instructions do not work 2002-Dec-05 16:40 dirkd mato
61 message service prints trailing binary zero ('\0') character 2002-Dec-11 13:43 frankb dirkd
Internet

SPI components available

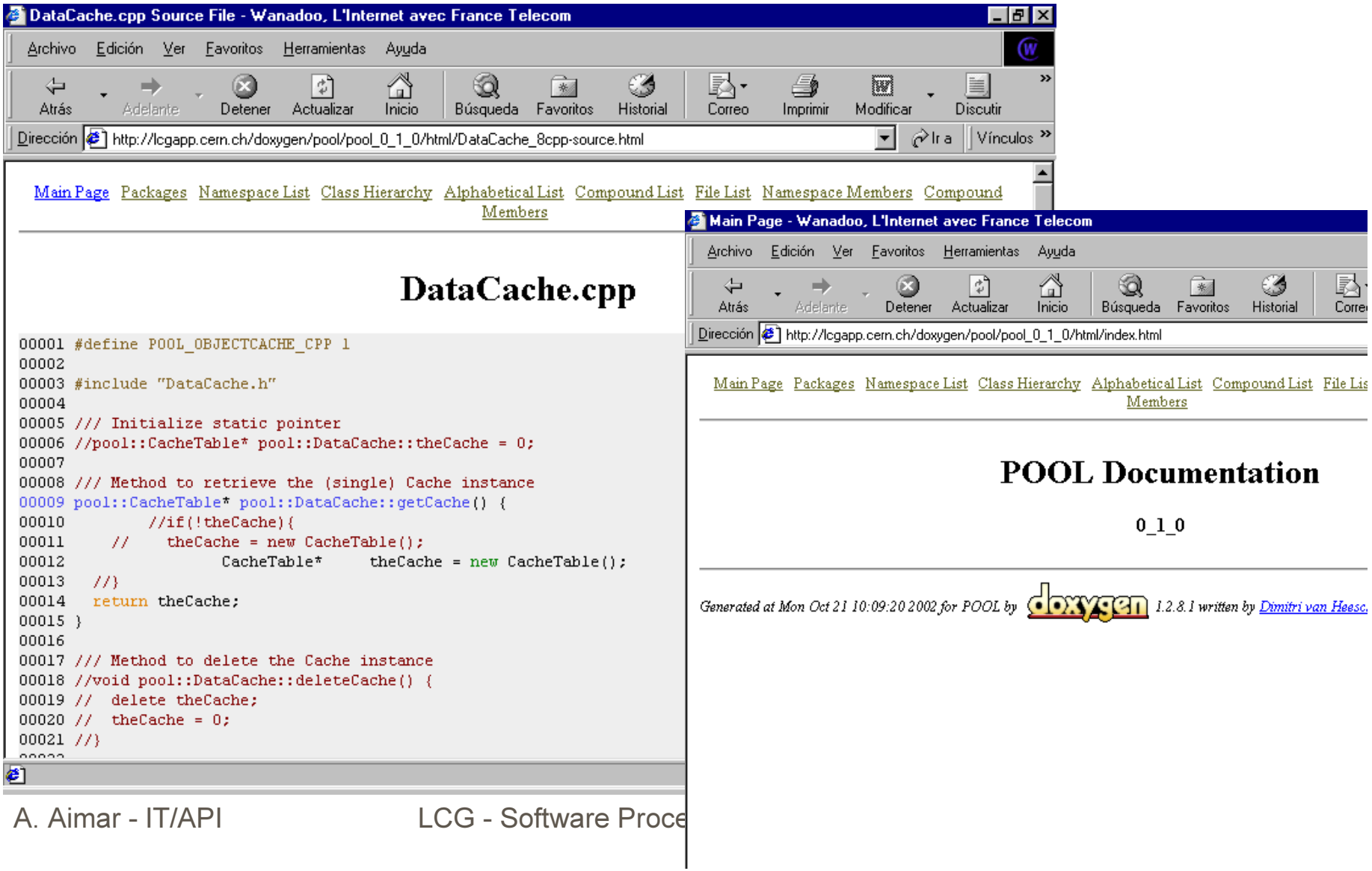
- All these components are available to LCG projects but still under completion. Release is for February 2003. Can be tried by "friendly" users in LCH experiments.

- Code Documentation — Doxygen, LXR, ViewCVS
- Testing Framework — CppUnit, Oval
- Memory Leaks — Valgrind
- Automatic Builds
- Coding and design guidelines — (RuleChecker)
- CVS organization
- Configuration/release mgmt — Scram
- Software documentation templates

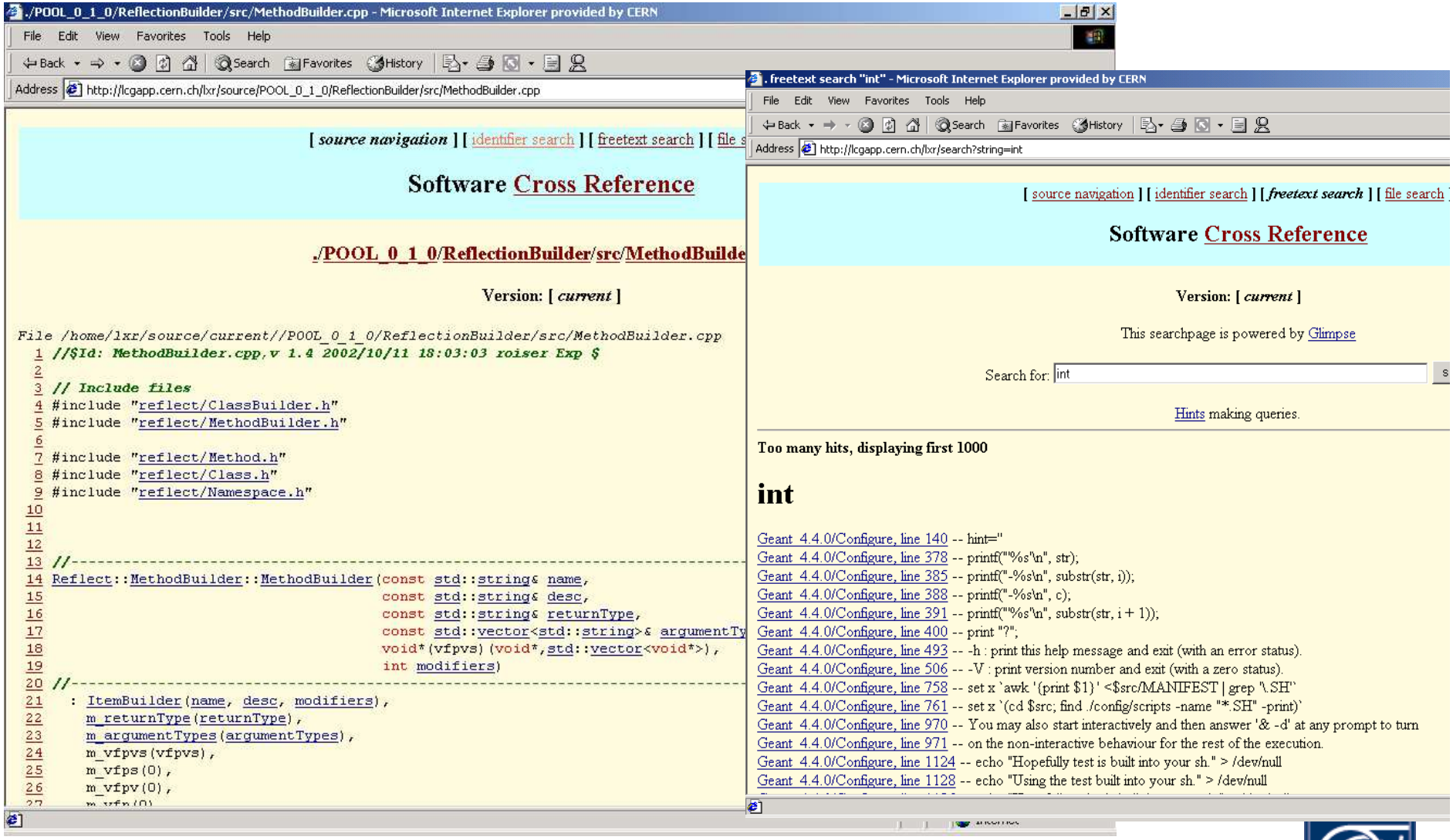
LCG SPI - Home Page - Microsoft Internet Explorer provided by CERN
File Edit View Favorites Tools Help
Search
Sony Gift Center
http://spi.cern.ch
LHC Computing Grid Project > LCG Applications Area > LCG Software Process & Infrastructure
LCG Software Process & Infrastructure
SPI Quick Links
SPI Home
SPI Index
Projects Portal
LCG App. Area
Home Page
LCG Agenda
MATH Project
PI Project
POOL Project
SEAL Project
SPI Project
External Links
CERN
EP Division
IT Division
NEWS
Updated: 18-Dec-2002 10:56
04/12/2002 Presentation: Project portal, and bug tracking
25/11/2002 New SPI Index Page (please bookmark it)
02/11/2002 Talk on Profiling by Rafi Yaari
20/10/2002 Presentations: Code Documentation and Unit Testing
12/09/2002 Service and Components descriptions
11/09/2002 Presentation: LCG SPI Status
Project Overview
The goal of the project SPI (Software Process & Infrastructure) is to provide to the development projects of the LCG:
basic environment for physics SW development
general scientific libraries class libraries
software development tools
documentation tools and document templates
compiler expertise
support activity necessary to ensure that a common grid-enabled environment is available at all grid sites
The reason for the Software Process & Infrastructure project is to have
More information
SPI Index page
All links useful to the users of the SPI project and the developers of LCG Application Area projects.
SPI Support page
Please write there all you support requests. Or by email.
SPI project description page
More details on the goals of the project.
Managing LCG Software
Requirements specified in the document RTAG2 Final Report
Thoughts on Software process by T.Wenaus. Thoughts on policy, process methodology, iterative development.
Local intranet


LCG SPI - Index Page - Microsoft Internet Explorer provided by CERN
File Edit View Favorites Tools Help
Address http://spi.cern.ch/indexpage.html
Go
LHC Computing Grid Project > LCG Applications Area > LCG Software Process & Infrastructure
LCG Software Process & Infrastructure
SPI Quick Links
SPI Home
SPI Index
Projects Portal
LCG App. Area
Home Page
LCG Agenda
MATH Project
PI Project
POOL Project
SEAL Project
SPI Project
Index Page
Updated: 16-Dec-2002 18:57
Infrastructure
CVS Service
How to use the LCG CVS service
Project Portal
Projects Portal for LCG
User registration
Software Library
How to install 3rd party software
SPI Templates
Work package doc (html)
Presentation
Test case description
Project plan template
Other Services
Software Development
Coding conventions
Coding guidelines
Design guidelines
Description of the component
Code documentation
Access to:
doxygen | LXR | ViewCVS
How to use the Code Documentation component
CVS organization
Standard CVS structure
How to develop software in the CVS structure
SCRAM manual
App. Area Projects
POOL Project
Home page | Project Portal | CVS repository | Bug reports | Mailing Lists
SEAL Project
Home page | CVS repository | Bug reports | Mailing Lists
PI Projects
Home page | CVS repository | Bug reports | Mailing Lists
Math Libs Project
Home page | CVS repository | Bug reports | Mailing Lists
http://spi.cern.ch/Components/CodingDesignConventions/Documentation/LCGdesignGuidelines.html
Internet

Code documentation: Doxygen

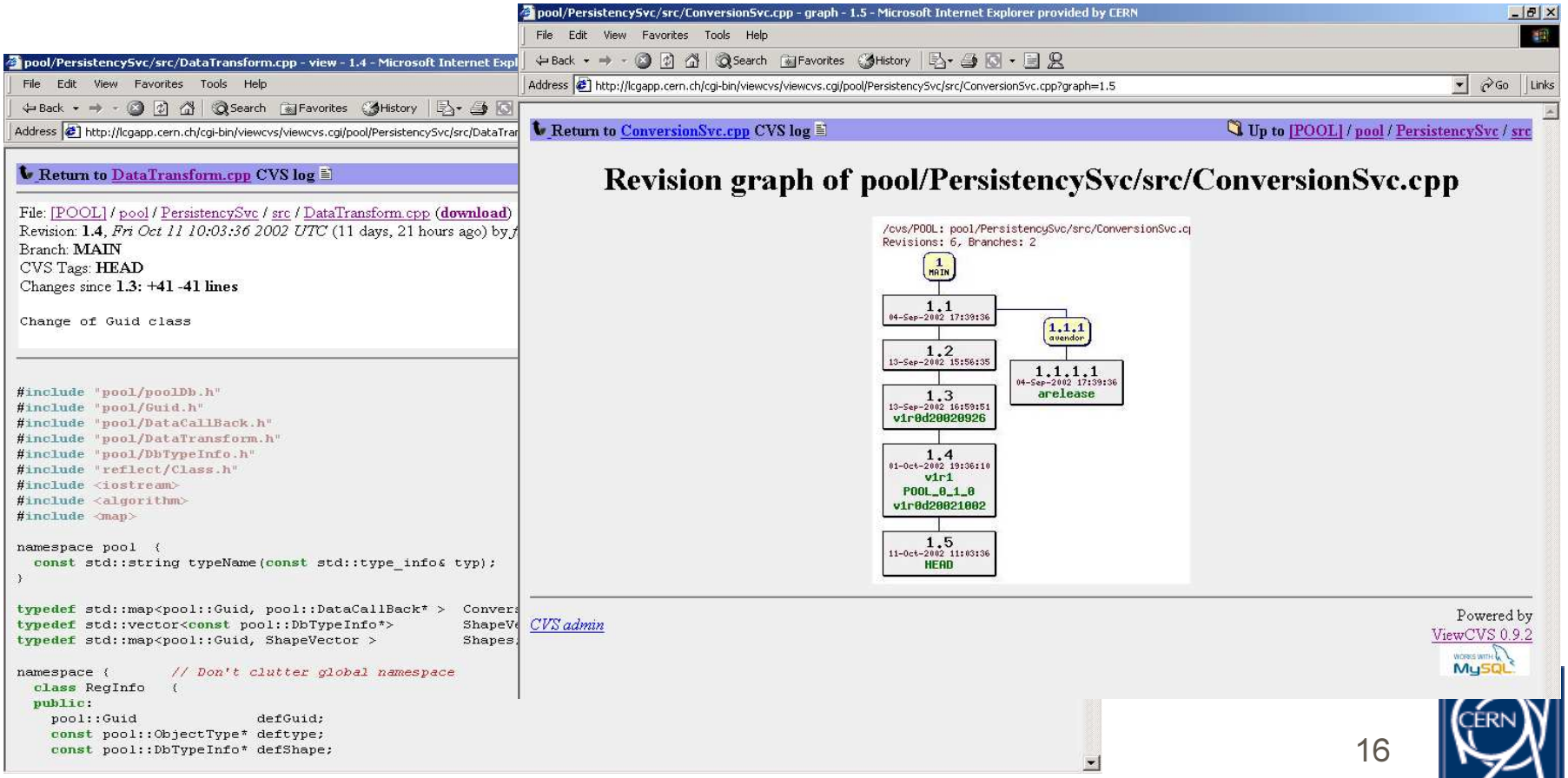


Code documentation : LXR



Code documentation: ViewCVS

- CVSgraph: Displays the tree of revisions and branches graphically
- Enscript: Colorize files in the CVS repository.



Test frameworks: CppUnit

Similar tools: Junit, PerlUnit, PyUnit, QtUnit

Output in XML, compiler or text

Windows version for MVC++6.0

```
xterm <6>

!!!FAILURES!!!
Test Results:
Run:  19   Failures: 2   Errors: 0


1) test: StringToolsTest::testToStringInt (F) line: 33 StringToolsTest.cpp
equality assertion failed
- Expected: 12345678
- Actual  : 123456789


2) test: ComplexNumberTest::testEquality (F) line: 22 ComplexNumberTest.cpp
assertion failed
- Expression: *m_10_1 == *m_1_1


PASS: test
==================
All 1 tests passed
==================
make[1]: Leaving directory `/home/user/mgallas/CppUnit-examples/newtest'
[pcitapi31] ~/CppUnit-examples/newtest >
```

A simple test

1. Subclass the TestCase CppUnit class
2. Override the method runTest().
3. call CPPUNIT_ASSERT

Test frameworks: Oval

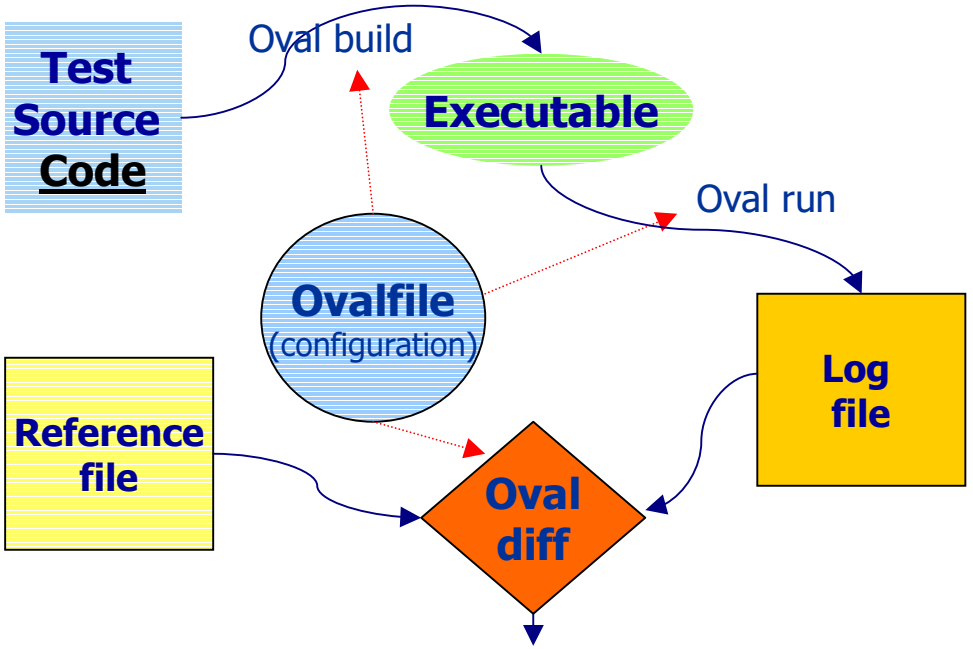
Oval:
- validation
- regression

Can be use for Unit-test

It is possible to set different run environments

Can run external scripts and external binaries

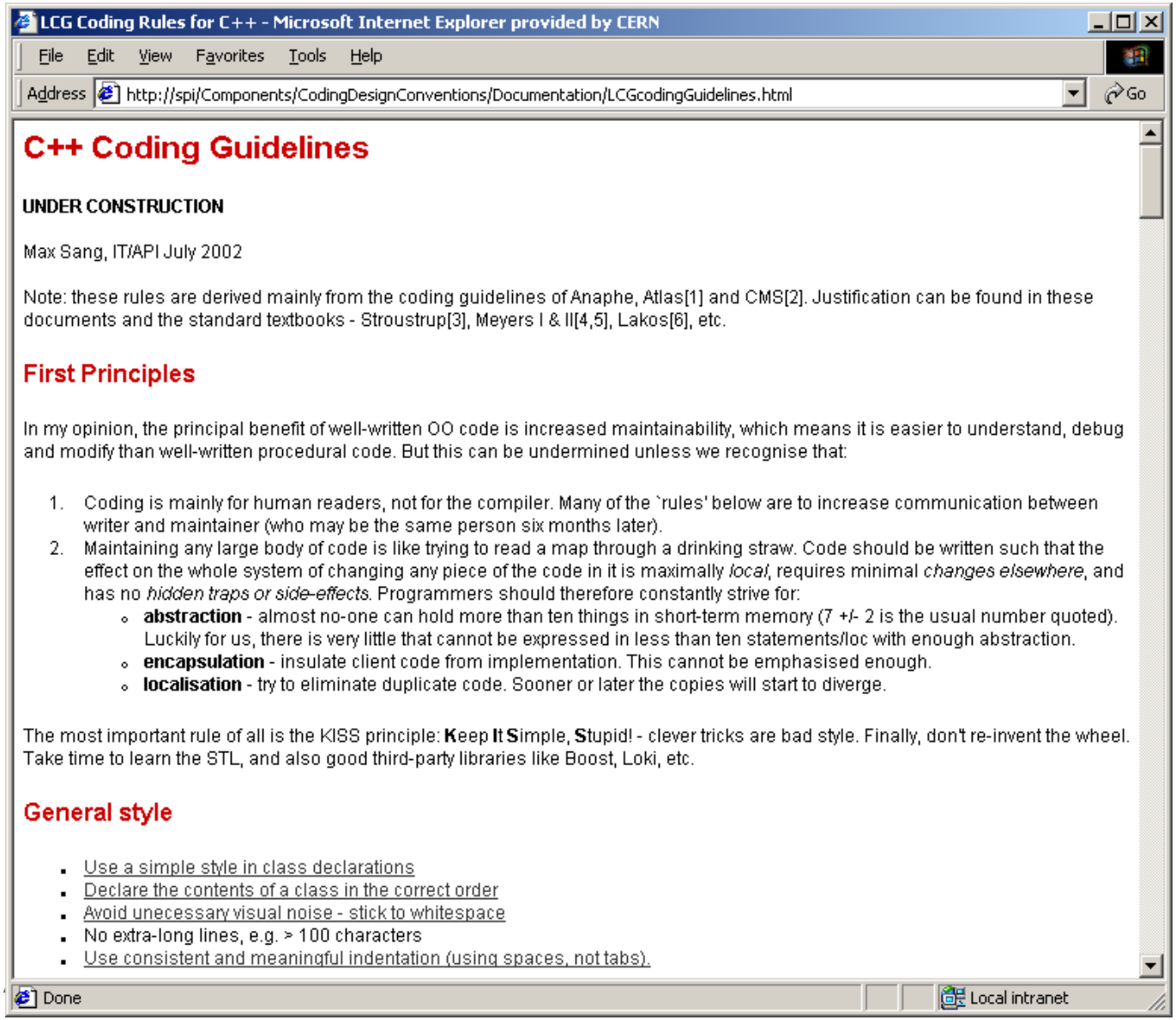
Authors modified it to run it with or with any environment




```
xterm <6>
[pcitapi31] ~/OVAL-examples/subtest1 > oval p
Prog1: build, run, diff.
Prog2: build, run, diff (DIFFS).
```

```
xterm <6>
[pcitapi31] ~/OVAL-examples/subtest1 > oval diff Prog2
========================== diff ==========================
(DIFFS)
=== log #29 !~ ref #65 (>15%)
log: [OVAL] result = 1.2
---
ref: [OVAL] result = 1
==========================================================
[pcitapi31] ~/OVAL-examples/subtest1 >
```

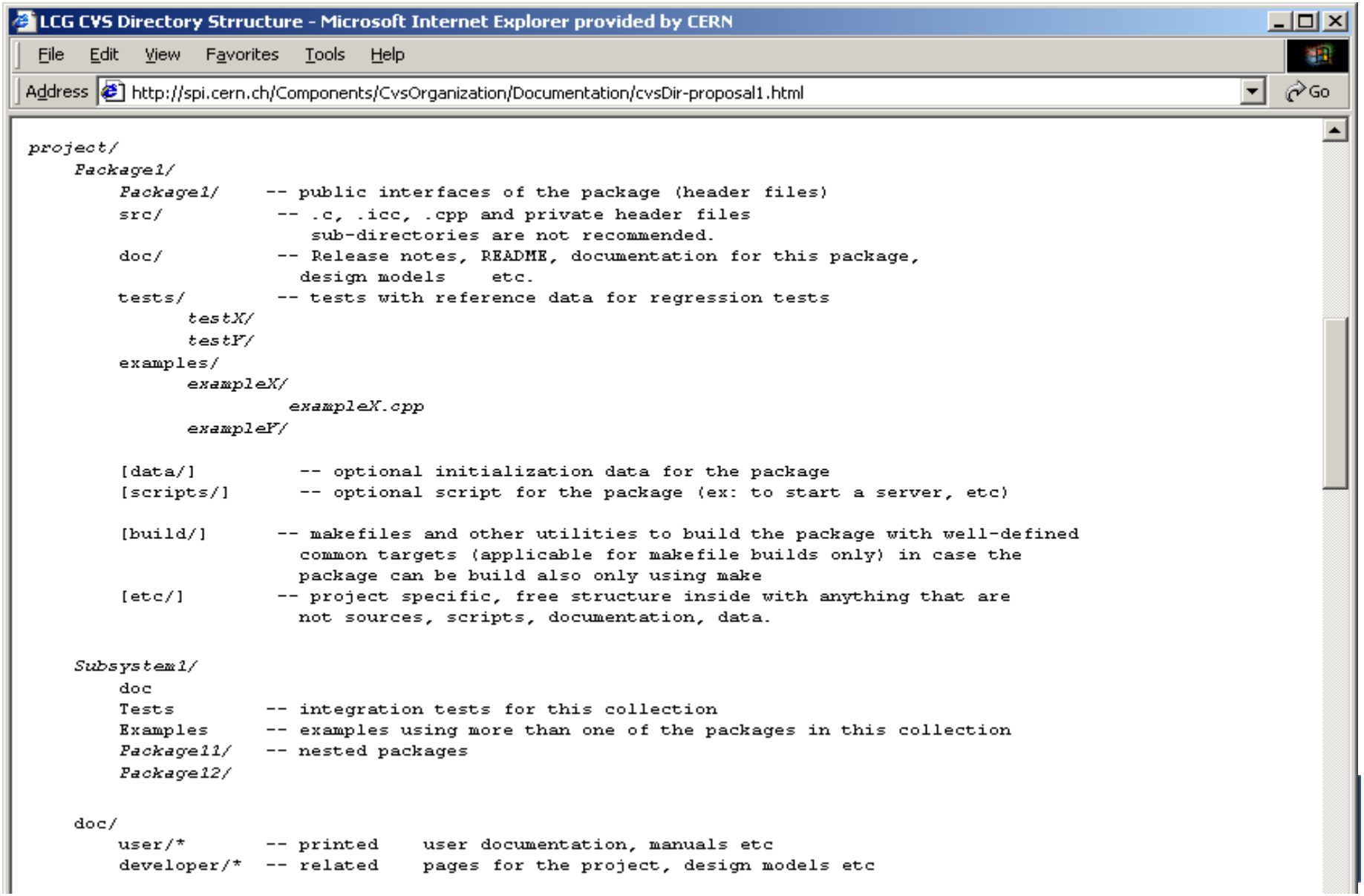
Coding guidelines



Rule Checker

Human Reviews

CVS organization

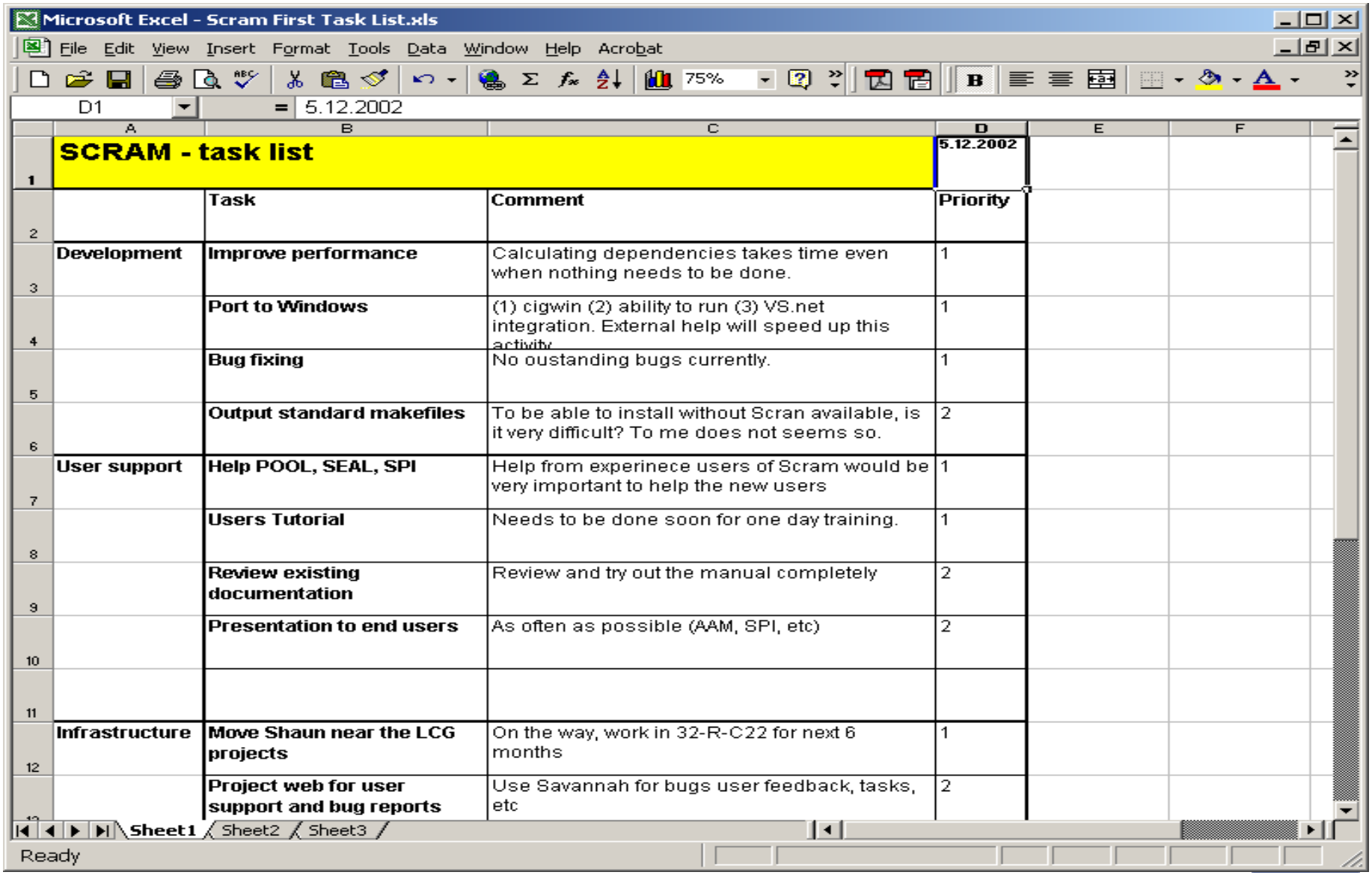



```
project/
    Package1/
        Package1/     -- public interfaces of the package (header files)
        src/           -- .c, .icc, .cpp and private header files
                          sub-directories are not recommended.
        doc/           -- Release notes, README, documentation for this package,
                         design models    etc.
        tests/         -- tests with reference data for regression tests
              testX/
              testY/
        examples/
              exampleX/
                        exampleX.cpp
              exampleY/

        [data/]          -- optional initialization data for the package
        [scripts/]       -- optional script for the package (ex: to start a server, etc)

        [build/]       -- makefiles and other utilities to build the package with well-defined
                         common targets (applicable for makefile builds only) in case the
                         package can be build also only using make
        [etc/]         -- project specific, free structure inside with anything that are
                         not sources, scripts, documentation, data.

    Subsystem1/
        doc
        Tests         -- integration tests for this collection
        Examples      -- examples using more than one of the packages in this collection
        Package11/    -- nested packages
        Package12/

    doc/
        user/*        -- printed    user documentation, manuals etc
        developer/*   -- related    pages for the project, design models etc
```

Just started…

- LCG External Software Library
  - Available already because of the kind help of Pool, Seal, Root and other contributors
- Configuration and Build with SCRAM
- LCG Workbook
  - Introduction to newcomers, developers and users of the LCG software.
- LCG QA
  - Using the tools provided by SPI
  - Having the testing tools can help, but is not sufficient
  - Actively help/encourage LCG projects to use them
  - Adapting SPI to the needs and experience of LCG projects

Configuration and Build: SCRAM



Microsoft Excel - Scram First Task List.xls

File Edit View Insert Format Tools Data Window Help Acrobat

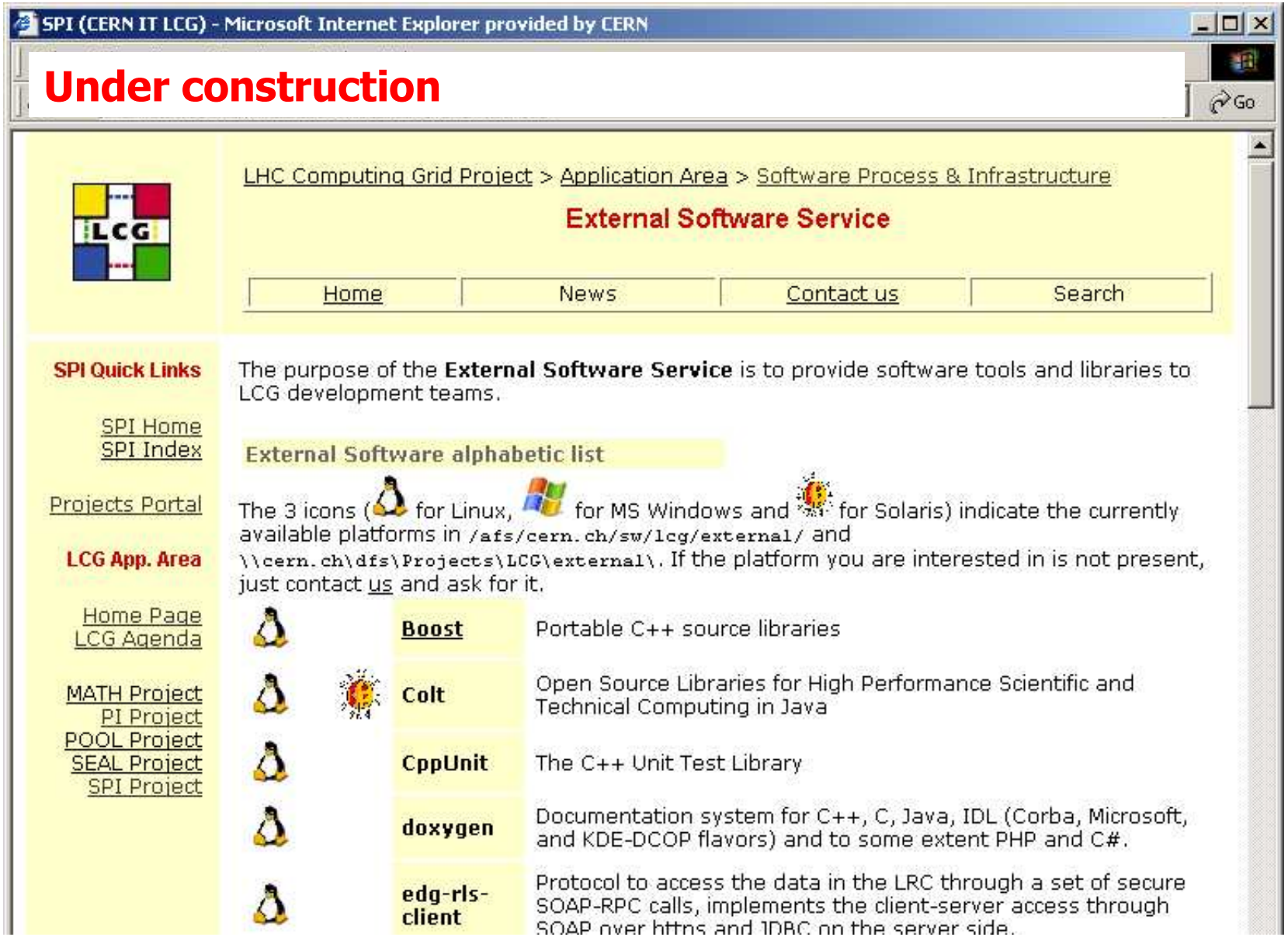
D1 = 5.12.2002

	A	B	C	D	E	F
1	**SCRAM - task list**			5.12.2002		
2		**Task**	**Comment**	**Priority**		
3	**Development**	**Improve performance**	Calculating dependencies takes time even when nothing needs to be done.	1		
4		**Port to Windows**	(1) cigwin (2) ability to run (3) VS.net integration. External help will speed up this activity	1		
5		**Bug fixing**	No oustanding bugs currently.	1		
6		**Output standard makefiles**	To be able to install without Scran available, is it very difficult? To me does not seems so.	2		
7	**User support**	**Help POOL, SEAL, SPI**	Help from experinece users of Scram would be very important to help the new users	1		
8		**Users Tutorial**	Needs to be done soon for one day training.	1		
9		**Review existing documentation**	Review and try out the manual completely	2		
10		**Presentation to end users**	As often as possible (AAM, SPI, etc)	2		
11						
12	**Infrastructure**	**Move Shaun near the LCG projects**	On the way, work in 32-R-C22 for next 6 months	1		
13		**Project web for user support and bug reports**	Use Savannah for bugs user feedback, tasks, etc	2		

Sheet1 Sheet2 Sheet3

Ready

LCG Software Library



LCG Workbook

Conclusions

- The SPI project is also based on our true effort to work with the user community to:
  - adopt some common infrastructure
  - help in the definition of the solutions
  - contribute to make a successful implementation of the infrastructure
- Homogeneity is important for the LCG and for its projects
- All work is done seeing the experts and work in LHC experiments and projects
- We all need to compromise

- The reference URL is **http://spi.cern.ch** the others may change.