Software Testing Infrastructure status

LCG Software Process & Infrastructure

(CERN, 10/23/02)

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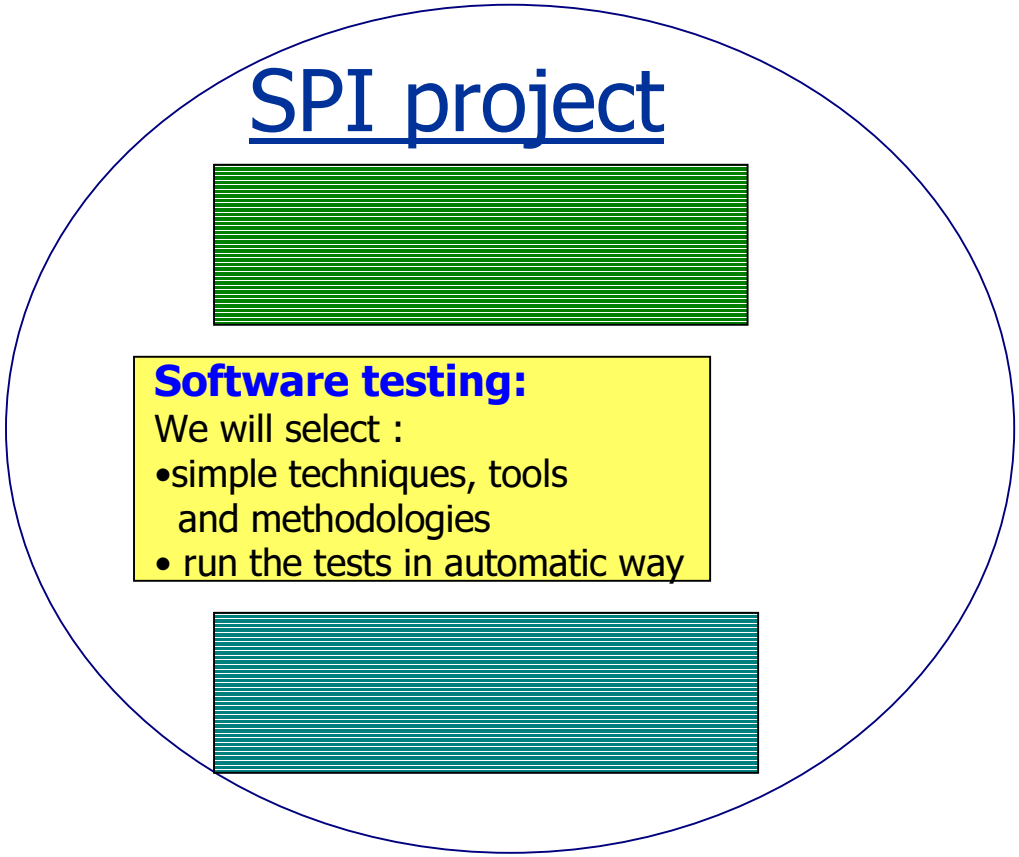
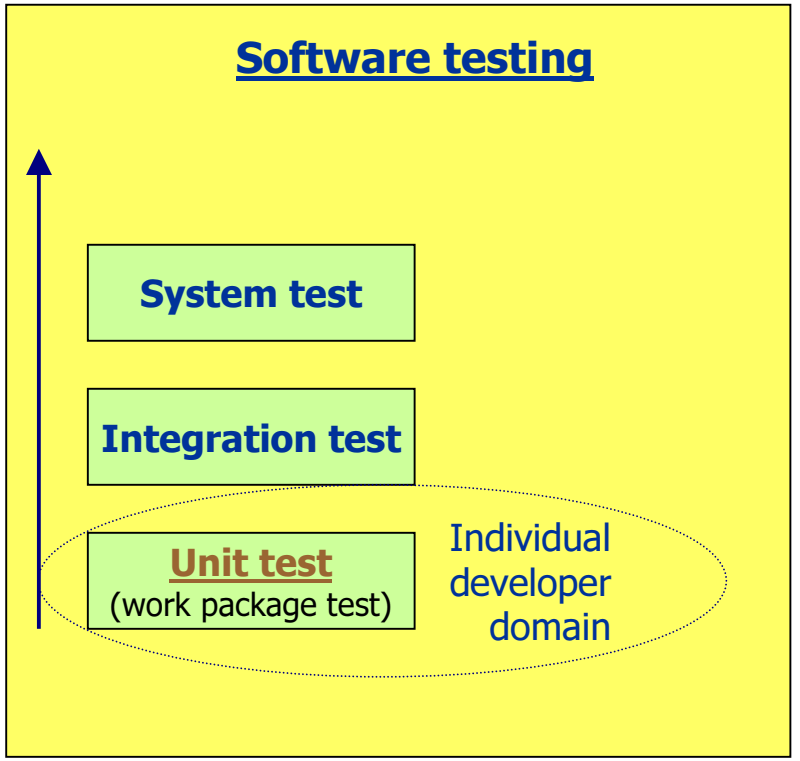
Overview:

LCG applications area project:

- software testing will be an integral part of the software development process
- All level of software testing should be run as part of an automatic process

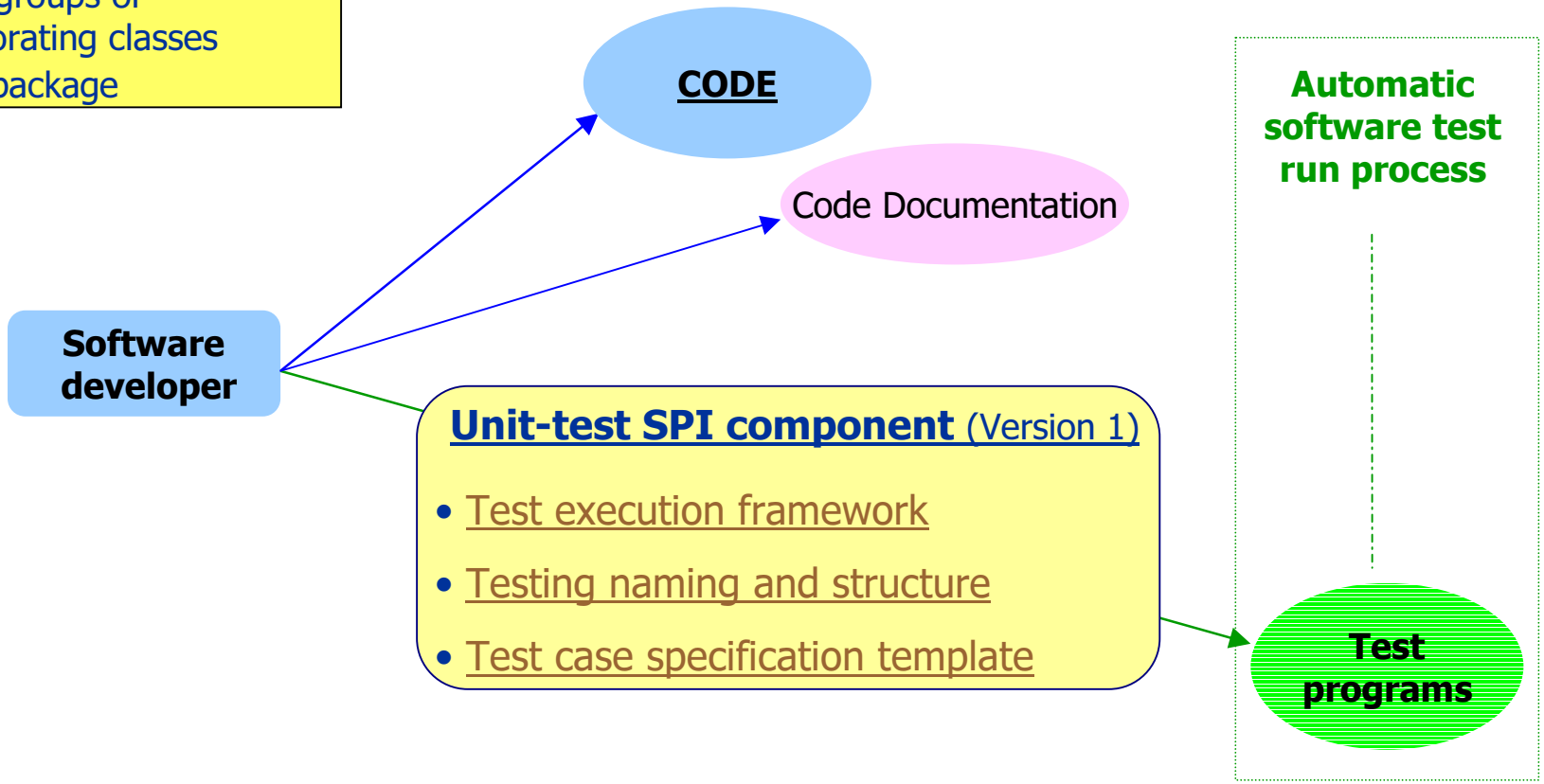




Unit Test:

Unit-tests
Should validate expected functionality at the level of:
- individual class
- small groups of collaborating classes
- work package

- **Important code should have unit tests**
- **Tests should be written together with the code**
- **Code should pass all unit tests before it can be released**



Unit-test: Test frameworks (I)

Aim: to help developers:
- to produce code for unit-testing
- to run tests in automatic way

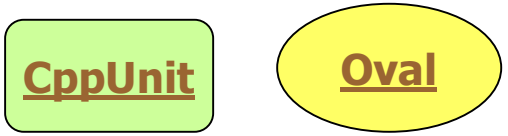
Our constrains:

- Avoid commercial software and licensing problems.
- Avoid "do it yourself solutions"
- Try to adopt commonly used open-source software.

Our inputs:

- Contacts within HEP-community (CMS and G4 mainly, until now).
- What is available as free open source code.

What we propose:



What we are doing:

- Trying CppUnit and Oval in the **LCG-POOL** project
- Preparing "HowTo" documents to make easier the installation of these tools and the start with process

Our plans:

- Analysis of the CppUnit and Oval tools in the POOL environment.
- Feedback from the experiments and big HEP software projects.
- Deliver and document the component soon.

Test frameworks (II): CppUnit

CppUnit:
Like JUnit but for C++

http://sourceforge.net/projects/cppunit
USED:
- in eXtreme Programing (XP)
- proposed for DataGrid

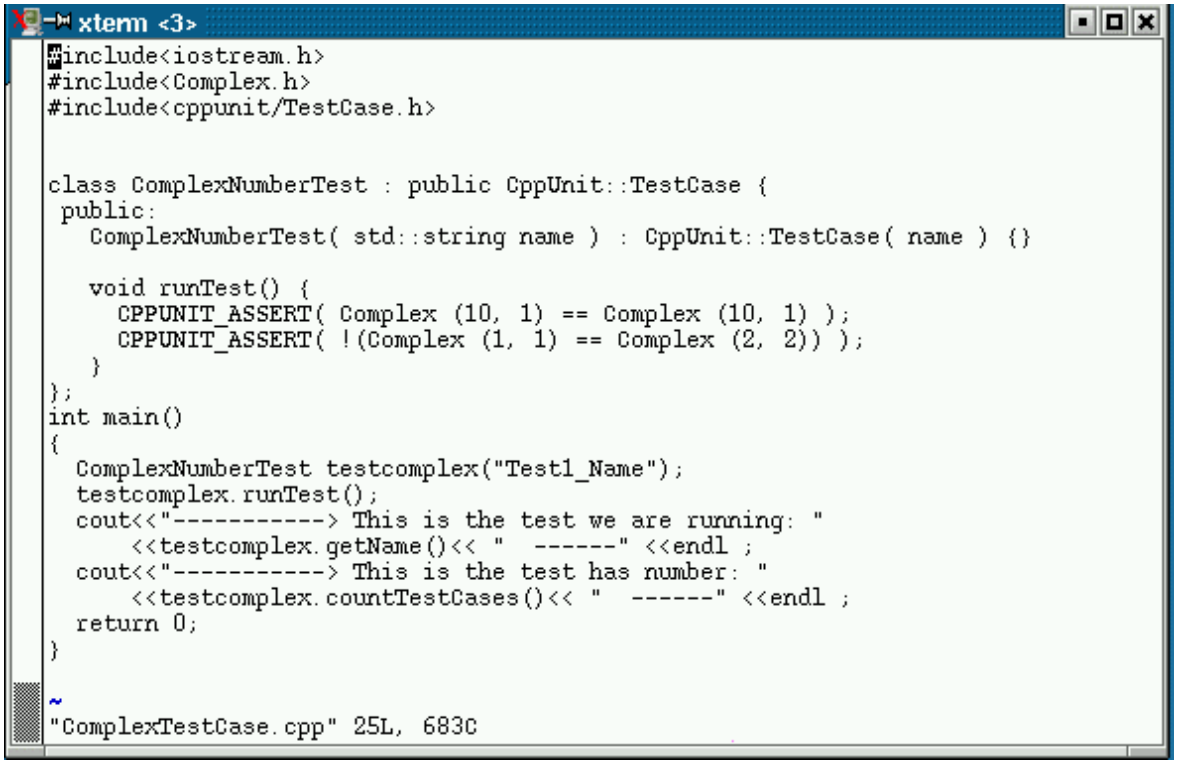
A simple test:
1. Subclass the TestCase CppUnit class
2. Override the method runTest().
3. When you want to check a value, call **CPPUNIT_ASSERT**(bool) and pass in an expresion that is true if the test succeeds

```
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 >
```

- Similar tools:
  Junit, PerlUnit, PyUnit, QtUnit
- Output in XML, compiler or text
- Windows version for MVC++6.0

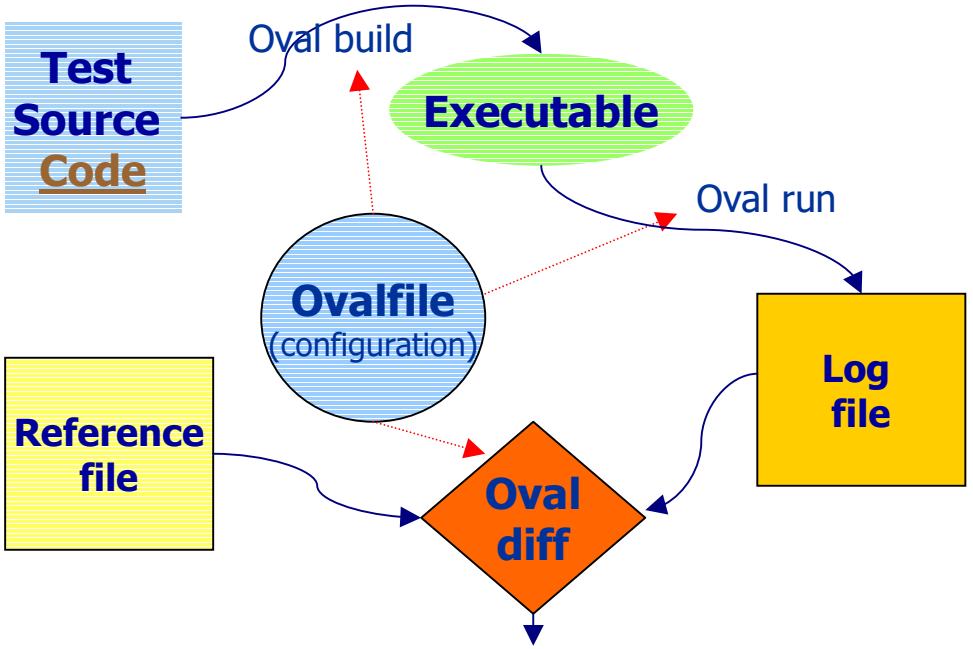
- Just starting in LCG-POOL project
  (1 test running)

Test frameworks (II$_{cont}$): CppUnit



Test frameworks (III): Oval

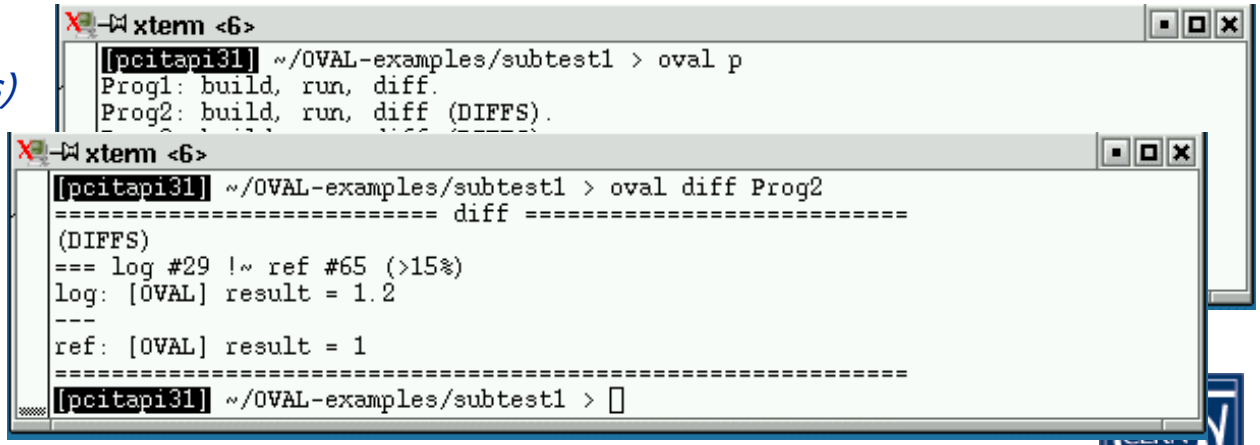
Oval:
- validation and regression
- used in CMS



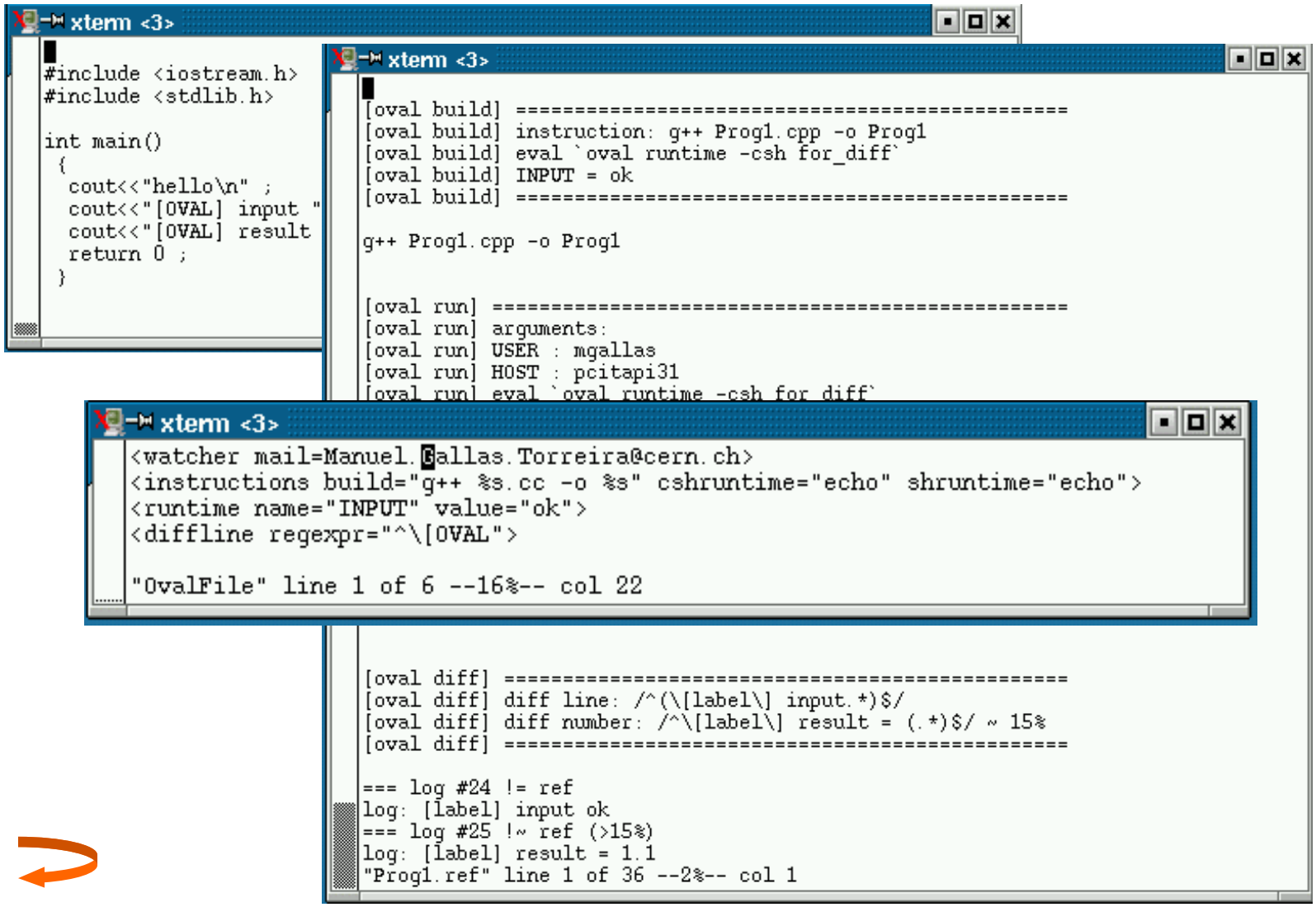
- Can be use for Unit-test.
- It is possible to set different run environments.
- Can run external scripts and external binaries.
- Authors modified it to run it with or without CMS specific environment (SCRAM …)

(*Thanks to David Chamont for the changes)*

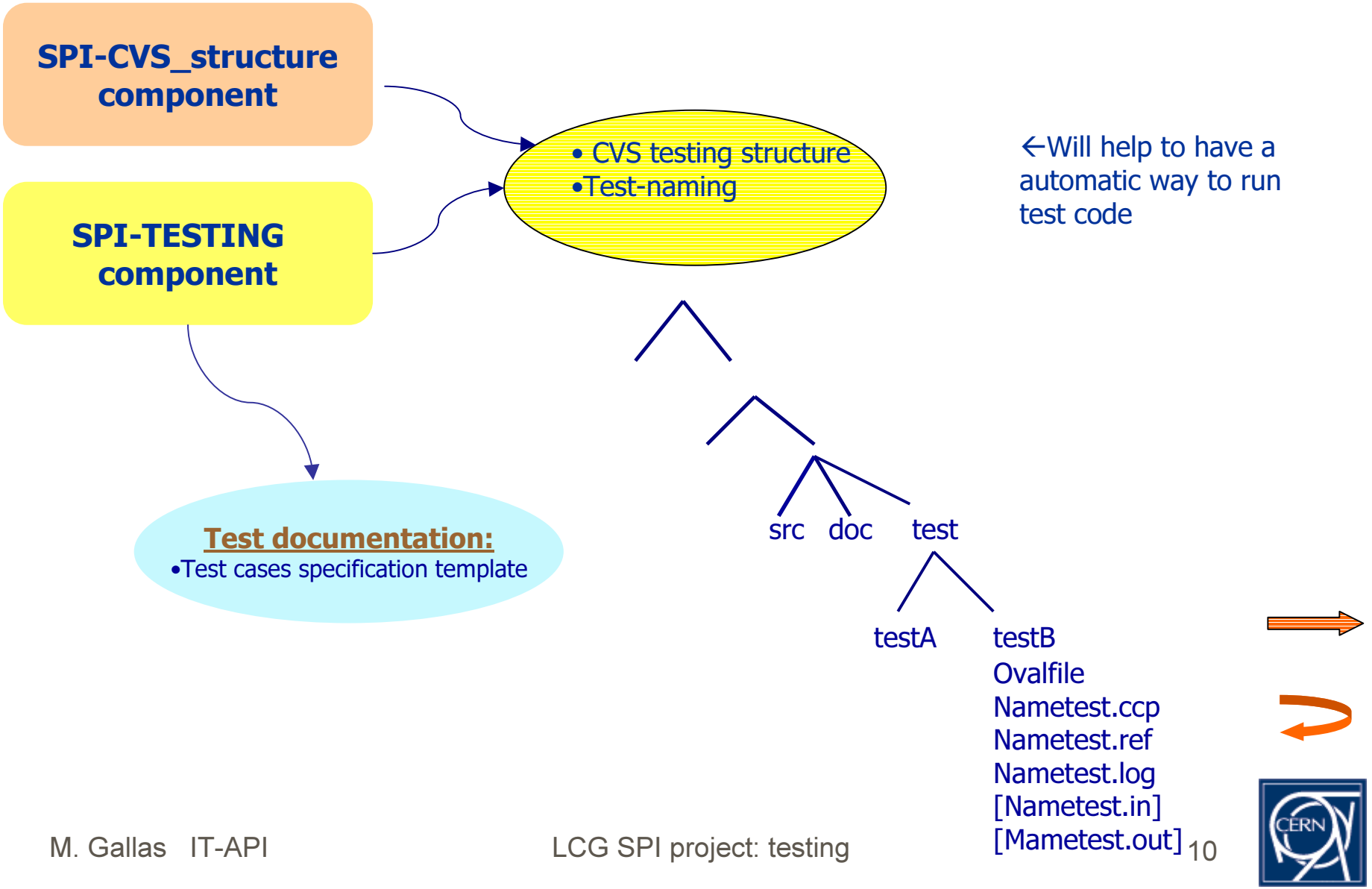
- Just starting in LCG-POOL project (1 test running)



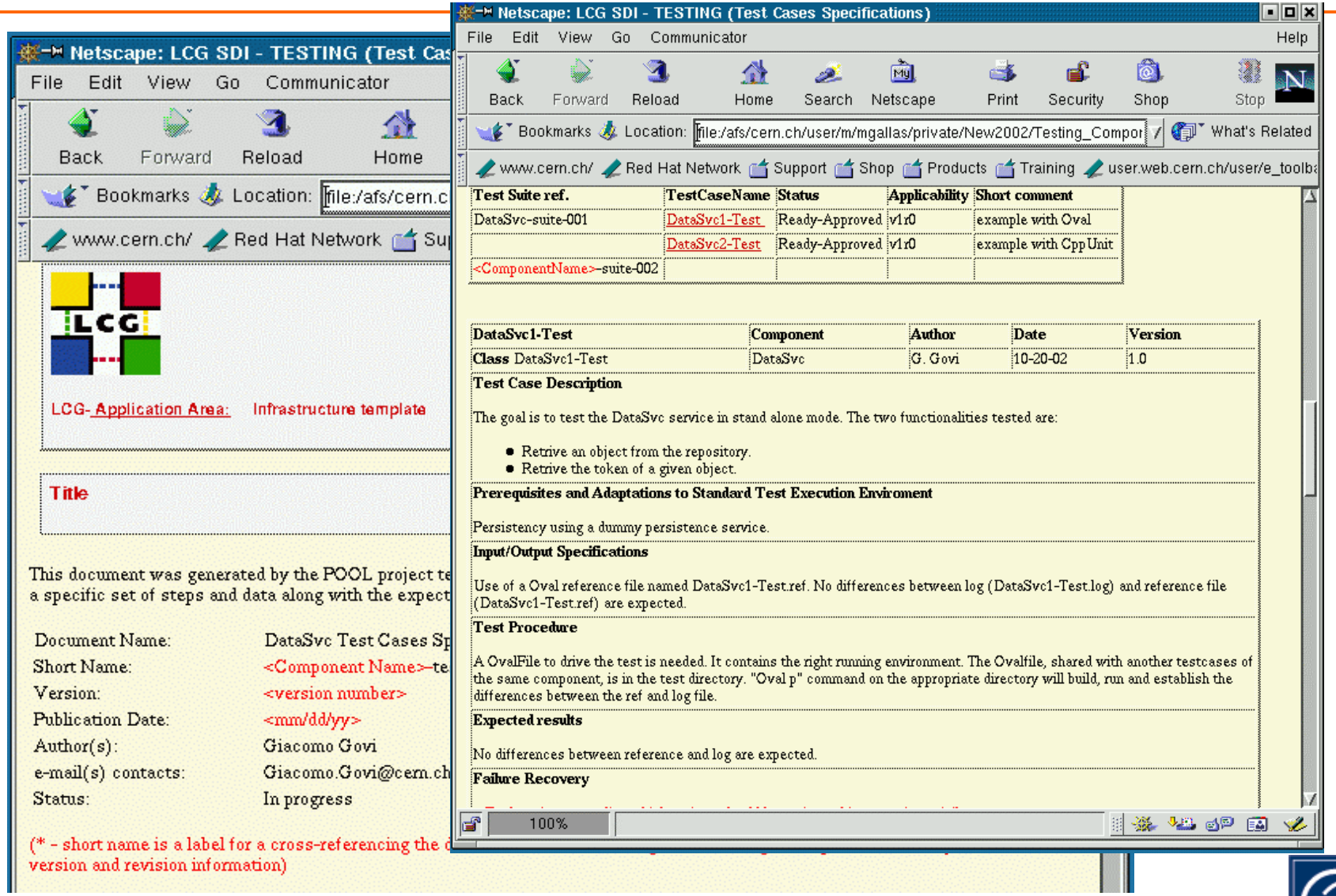
Test frameworks (III$_{cont}$): Oval



Unit-test: structure and documentation



Unit-test: documentation



Status & Future Plans:

Status:

- Installing the component
- Supporting the component at POOL project
- Doing some test cases with them
- Preparing Howto's

Future Plans:

- Produce a first version of the **SPI-Testing Component (V1)** which will provide:
  - unit-test organization
  - test execution framework
  - test documentation and templates
  - complete user-documentation
- Feedback with the HEP experiments and big software projects.

INDEX review:

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Thanks to:

- contacts within the experiments
- LCG-POOL team
- D. Chamont (Oval)

Howto for installation and examples will be available soon…

Feedback and interaction are always welcome!!