Testing for patch certification

Gianni Pucciani

SA3 All Hands Meeting, Prague 06 November 2008

www.eu-egee.org

e-infrastructure

Outline

- Introduction.
- Current status of the testing process.
- Running tests and regression tests.
- Writing new tests, guidelines.
- Patch certification survey results and hints.

Testing activity

- What we test:
  - Deployment + functional + regression tests on the CTB, during *patch* certification; to test the service functions using API or CLI, including basic service checks (ping test, BDII checks).
  - Performance and stress tests are done only when required, on dedicated machines. They are not part of the normal patch certification procedure.
- What we do not test:
  - Unit tests, must be done by service developers.
  - *Complex* and *systematic* use cases, performance and stress tests done on request during “pilots” in pre-production.

Current status

- List of available tests: https://twiki.cern.ch/twiki/bin/view/LCG/AvailableTests
- Service certification checklist https://twiki.cern.ch/twiki/bin/view/EGEE/ServiceCertificationChecklist
- For patch certification tests are run from the command line (Shell, Python, Perl scripts). Meta-script are available whenever possible to run all the necessary test scripts in one shot.
- A framework to automatically run regression tests is available.
- Writing tests is a continually evolving process; tests must be easily added and integrated in the test repository and made immediately available for patch certification.

Current status: testing during patch certification

Testing during patch certification:

1. Install a (virtual) machine with the given service (production version).
2. Reproduce the bugs(*).
3. Write regression tests(*) (**).
4. Install the patch.
5. Verify that the bugs have been fixed.
6. Follow the instructions on the service certification checklist on how to run tests for the given service. Usually checkout the tests from CVS and launch a bash meta-script. When available, run regression tests using the regression tests framework.
7. Attach the meta-script and regression tests output to the Savannah patch tracking system.

(*)A few criteria to decide when 2,3 can be skipped are listed here:
https://twiki.cern.ch/twiki/bin/view/EGEE/BugNonVerification

(**)In some cases a regression test can be written after the patch is certified.

Current status: testing scripts, CVS architecture

Tests scripts are available on CVS:

(http://glite.cvs.cern.ch/cgi-bin/glite.cgi/org.glite.testsuites.ctb/)

Example:

```
AMGA/
    tests/
        AMGA-test_ping.py
        AMGA-test_functions.py
        AMGA-test_statistics.py
    manual/
        README
    AMGA-certtest.sh
    AMGA-certconfig.sh
APEL/
BDII/
.......
```

Current status: running the tests

Example from the AMGA tests:

```
#>./AMGA-certtest.sh
START Mon Sep 15 14:10:57 CEST 2008
-------------------------------------
Executing AMGA-test_ping.py
AMGA-test_ping.py PASSED
Executing AMGA-test_functions.py
AMGA-test_functions.py PASSED
Executing AMGA-test_statistics.py
AMGA-test_statistics.py PASSED
-------------------------------------
END Mon Sep 15 14:11:01 CEST 2008
TEST_PASSED
```

```
#> ./AMGA-certtest.sh
START Mon Sep 15 14:09:50 CEST 2008
-------------------------------------
Executing AMGA-test_ping.py
AMGA-test_ping.py PASSED
Executing AMGA-test_functions.py
AMGA-test_functions.py FAILED
Executing AMGA-test_statistics.py
AMGA-test_statistics.py PASSED
-------------------------------------
END Mon Sep 15 14:09:54 CEST 2008
TEST_FAILED
The following tests failed:
AMGA-test_functions.py: results in
tests/AMGA-test_functions.py_result.txt
```

Regression tests

- A regression test is bound to a specific bug, and it may involve the deployment of multiple nodes with specific configurations. It is note always possible to write a regression test, please refer to one of the points listed here:
  https://twiki.cern.ch/twiki/bin/view/EGEE/BugNonVerification
  and state clearly the reason not to reproduce a bug.

- A number of regression tests (mainly DM and WMS) is already available. A framework to easily run tests and extend the regression tests repository is available:
  https://twiki.cern.ch/twiki/bin/view/LCG/SAMTests#Regression_Tests.

- Certifiers are strongly encouraged to write regression tests during patch certification, where it often requires a minimal overhead. From our experience more than 50% of the bugs are candidates for regression tests.
- **Producing regression tests must be part of the patch certification process, it does not have to be considered a worthless hassle.**

Regression test writing

./regTest.sh ./regTest.sh –tl testlists/mybugs.txt

./bugs/

bug1596 bug22165 …

test_bug1596_pre ()
test_bug1596 ()
test_bug1596_post ()

./config/

commonFunctions.sh config.sh

./testlists/

mybugs.txt mybugs.sh

1596
22165
…

VO=dteam
SE_DPM=se.cern.ch
…

by Andreas Unterkircher

SA3 All hands meeting May 2008

Missing tests

- A list of missing tests is available and constantly updated: https://twiki.cern.ch/twiki/bin/view/EGEE/GliteTestMissing
- Some examples:
  - File Transfer Service (FTS):
    - Testing the FTS Java API.
    - Further tests with all combination of SEs.
    - Tests with different VOMS roles.
  - LCG File Catalog (LFC):
    - Test the Perl API.
  - SCAS
- *For new services, a document describing the main functionalities and interfaces should be provided before the service enter the release process.*

Writing new tests

- If you are collaborating in writing tests please make sure that:
  - a task is assigned to you and tracked through the Savannah task tracking system (contact Diana.Bosio@cern.ch).
  - your contact information appear here: https://twiki.cern.ch/twiki/bin/view/EGEE/EGEECertification#Test_writers_maintainers_table
  - you are subscribed to the list: egee-sa3-testing@cern.ch

- Test writing guidelines: https://twiki.cern.ch/twiki/bin/view/EGEE/EGEECertification#Test_writing
  - Provide a test plan explaining the tests that will be implemented.
  - Priority to service ping tests and functionality tests (CLI and API).
  - Tests should be launched from the command line (Bash, Perl, Python), without the need of using any framework. The CERN certification team will take care of the integration in the test repository.
  - Provide adequate documentation.
  - Tests maintenance is done by the CERN certification team, with the test developer's help when needed.

Testing frameworks

- Testing during patch certification has to be quick and easy so that we can profit from a distributed and dynamic list of certifiers provided by SA3 partners.

- Testing frameworks:
  - *SAM*: used to monitor the certification Testbed.
  - *Nagios*: under evaluation. It will be used to monitor the certification Testbed.
  - *ETICS*: under evaluation, so far more suitable for unit tests and deployment tests (rpm installation) done by developers.

Patch certification survey results 1/2

- **15 surveys completed**.

Hints:

1. ~ 70% of certifiers has low-medium experience. The process cannot assume high level of expertise in certifiers:
   1. *Make the process as much automated as possible.*
   2. *Clearly state instructions on how to reproduce a bug in Savannah.*

2. Most time consuming phases: checking that bugs are fixed, reproducing the bugs, writing regression tests. Configuring the service and running mandatory tests have to be faster and easier.
   1. *See 1.2*
   2. *Improve (and distribute?) an automated installation/configuration tool like yaimgen for working in the CTB.*
   3. *Automate mandatory tests as much as possible.*

3. 12 out of 15 certifiers use a virtualization system during patch certification.
   1. *Opening vNode for accessing it from outside CERN?*
   2. *Distributing vNode?*

Patch certification survey results 2/2

4. 40% do not know how to write regression tests and integrate them in our framework
   1. *I hope after this talk there will be no doubts anymore ☺*

5. Most certifiers do not write enough regression tests (85%) or do not write regression tests at all (33%). Congratulations to the only (anonym) certifier who is writing regression tests in more than 50% of the bugs.
   1. *Include 'writing regression tests' into the patch certification process giving more time for the task of certifying a patch.*
   2. *Maintain the list of missing regression tests allowing a certifier to write a regression test after certifying a patch.*
   3. *Clearly reference one of the point in https://twiki.cern.ch/twiki/bin/view/EGEE/BugNonVerification when it is not possible to produce a regression test.*

Conclusions

- How to write tests and regression tests for patch certification.
- The testing effort must be shared among developers, certifiers, pre-production (pilots).
- Regression tests are the weakest point in our certification process.
- Interesting results came out of the survey, though not surprising in most of the cases. Thanks for your contribution!

Useful links

- **SA3 Testing and Certification**
  - Available tests

    https://twiki.cern.ch/twiki/bin/view/LCG/AvailableTests
  - Service Certification Checklist

    https://twiki.cern.ch/twiki/bin/view/EGEE/ServiceCertificationChecklist
  - Test writing guidelines

    https://twiki.cern.ch/twiki/bin/view/EGEE/EGEECertification#Test_writing
  - Missing tests

    https://twiki.cern.ch/twiki/bin/view/EGEE/GliteTestMissing
  - CVS tests repository

    http://glite.cvs.cern.ch/cgi-bin/glite.cgi/org.glite.testsuites.ctb

- **Certification Testbed**
  - Contacts and how to join the Testbed

    https://twiki.cern.ch/twiki/bin/view/EGEE/CertTestBedWorld

- **vNode**
  - Web Site

    https://vnode.web.cern.ch
  - Web Application

    https://vnode.web.cern.ch