

Subject: **TEST AND VALIDATION PROCESS**

Author(s): **Andre Formica, Bob Jones, David Foster, Gabriel Zaquine**

Distribution: **WP Managers**

---

## 1. INTRODUCTION

This document proposes a test and validation process in order to rationalize these activities and to prepare works in LCG environment.

This document should be considered as a draft and many points of the process presented below have to be completed and optimised (see issues 2.4)

Quality needs to be at present at every point in the software creation process. It cannot be added. Nevertheless the process needs to be defined and the quality issues then dealt with at every point.

The process for release 1.2 will not be interrupted but the new process presented below will now be executed on version 1.2 software in parallel. This will enable the roles, responsibilities and test plans to be finalised. It will also prepare the process for full implementation on the next release of the EDG software (assumed to be 1.4). The process will be reviewed once it has been applied to release 1.4. The process definition is to be completed by September 2002 and used for the release 1.4.

## 2. TEST AND VALIDATION PROCESS

The process proposed below in its main lines should be formalized through the following points:

- The inputs and outputs for each stage.
- The formal exit criteria, the tests performed.
- The team responsible and team leader.
- The expected duration.
- The hardware/testbed platform.
- The communication mechanisms with other teams.
- The actions when problems are found.
- The signoff procedure when everything is ok.

## 2.1. PROCESS STEPS AND TEST ACTIVITIES

Test activities take in account the actual organisation and the LCG certification (step 5 and 6):

### 1. WP Development & Unit tests

Middleware WPs have scheduled access to the development testbed for their own development and testing activities. Such "WP slots" would typically last one week and must be terminated by leaving the development testbed in a stable state (e.g. auto tests run successfully).

Unit tests plan are performed on individual software modules of a WP to test their basic functionality.

### 2. Build validation

Integration tests are performed on built integrated software components from all WPs to verify their correct inter-operation. This activity is currently performed by the Integration Team (ITeam).

ITeam verifies that the release can be deployed (install + configured on the development testbed) and run basic functionality tests. The problems found should be fed back to WP via their ITeam representatives. The WP will then deliver a corrected version, again unit-tested if possible. This process is repeated until ITeam decides to deliver the new release, providing then a list of RPMs, an updated installation guide and a user and developer guide for every new software module.

A test subset can be automated (e.g. via scripts etc.) and integrated as part of the nightly build procedure as non regression tests.

### 3. Grid validation

Installation and distribution tests, basic grid functionality tests, tests of grid services: security, information, brokering, data catalog etc. This activity is currently performed by the testing group (TSTG).

The testing activity of TSTG should be oriented to insure correct installation and configuration of the new software release, and then to functional and destructive testing as described in the TSTG plan. Service specific tests should be integrated in the test framework. This framework can be used also for the basic functionality tests of ITeam.

The testing group also has a number of testbed sites that are not integrated in any official testbed. They are used by the TSTG, in particular, for installation and destructive tests.

### 4. Application validation

Functionality tests performed using application groups' applications and test scenarios. These tests correspond to the validation tests currently being organized by EIP (informally known as the Loose Cannons)". Representatives from WP9 & WP10 should also be included in this task.

### 5. System validation

Tests with regional centers on complete grid system functionality. Includes regression, load and performance tests. This activity will be performed by the LCG certification team and need further definition.

### 6. Version release

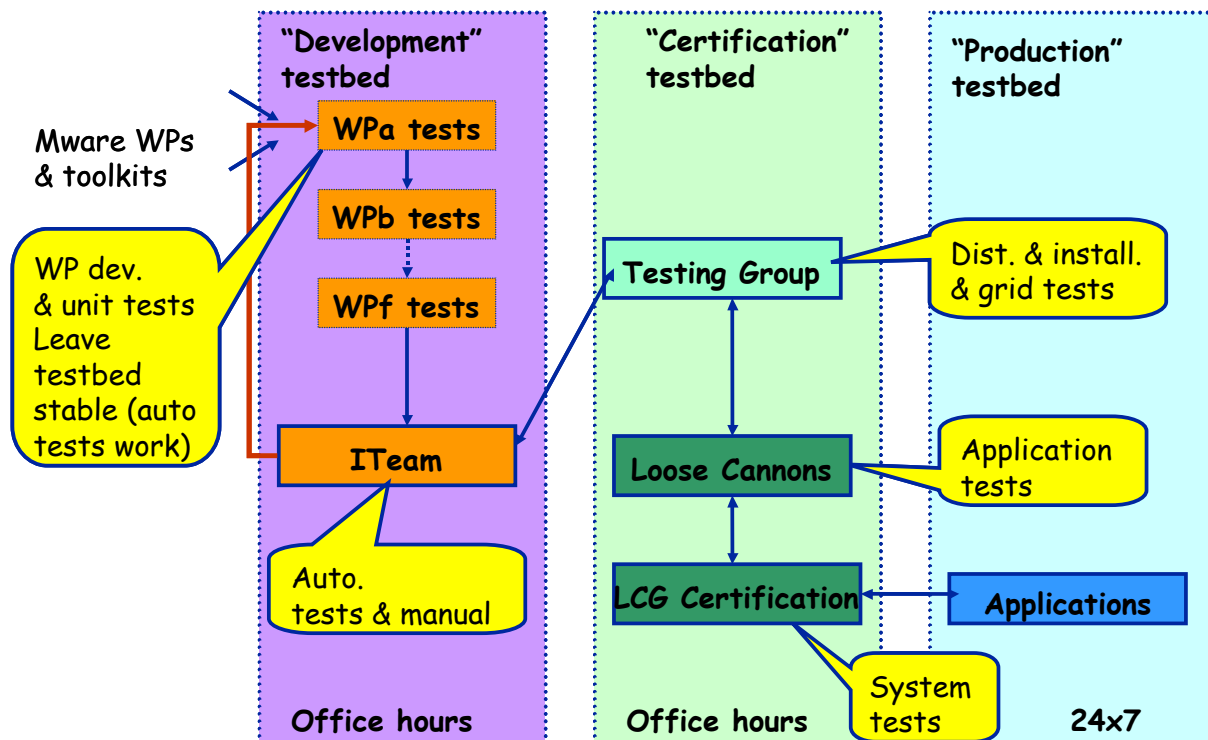
Scheduled introduction into production. Transfer of documentation and training to User and operations support, final training and publication of end-user documentation. This activity will be performed by the LCG certification team.

## 2.2. TEST ENVIRONMENT

The new plan calls for the creation of the "new" test environment (as opposed to "dev" and "pro"). This new environment is called "certification testbed". This is to be a stable environment on which the EIP will work and which becomes the candidate certified software environment. It matches the "trident model".

The following schema describes the testbed environment and tests activities:

- Development Testbed. Existing EDG development testbed. Support during office hours.
- Certification Testbed (New). To be created in conjunction with LCG. Support during office hours.
- Production Testbed. Based on existing EDG testbed but needs extra resources and sites as well as a round the clock support.





# Note

Doc. Identifier:  
**DataGrid-12-NOT-0238-0-4-  
 TestValidationProcess**

Date: **02/07/2002**

## 2.3. DETAILED PROCESS OF TESTING AND TESTBED ENVIRONMENTS

Stage	Input	Output and formal exit criteria	Tests Performed	Team	Leader	Typical Duration	Test Environment	Communication	Problem Actions (3)	Signoff
1. Unit Tests	WP release candidate	WP unit tested release candidate	Unit Test Plan	WP	WP Quality Assurance representative (1)	N/A	Development testbed	Meetings /Mail	Bugzilla	Meeting with Integration Team
2. Build Validation	All WP unit tested release candidates	Integrated Software Build	Build, Deployment and Basic Tests	Integration Team	ITeam Leader (Charles)	4 Weeks	Development testbed	Meetings /Mail	Mail/Meetings with WP's	Meeting with Testing Team
3. Grid Validation	Integrated Software Build	Build validated against test plan	Integration Test Plan (Installation, Grid Tests)	Test Team	?	4 Weeks	Certification Testbed	Meetings /Mail	Mail/Meetings	Meeting with EIP
4. Application Validation	Build validated against test plan	Build passed App Quality Measures	Application Test Plan	EIP	F. Carminati	4 weeks	Certification Testbed	Meetings /Mail	Mail/Meetings with WP's	Meeting with LCG Certification team Release meeting
5. System Validation	Build passed App Quality Measures	Build Ready for Production	System Test Plan	LCG Certification	Zdenek Sekera (2)	2 weeks	Certification Testbed	Meetings /Mail	Mail/Meetings with Cannons	Meeting with EDG Project management
6. Version release	Build Ready for Production	Certified Build	Release Test Plan (Documentation, packaging etc)	LCG Certification	Zdenek Sekera (3)	2 weeks	Production Environment (LCG, ...)	Meetings /Mail	Meetings/Mail	User Meeting

1, 2: See explanations here after.

3: Existing EDG Bugzilla problem tracking system should be used to record all confirmed problem found.

1. The WP quality assurance representative (QR) will promote the quality inside each work package with actions as:
  - Control WP deliveries: Testplans, test cases, Test coverage, software documentation, necessary instructions to build and configure the software (installation guide) and user guide.
  - Promoting the use of common tools as: xUNIT, autotool, Insure
  - Promoting cross reading source code
  - Promoting the EDG naming conventions
  - Establishing with the others WP quality assurance representative a set of rules for the portability of the code
  - Organising with EDG management the necessary training to tools and methodology
2. Zdenek Sekera will work on the clarification of the process (indicated above) and establish the "new" environment together with the appropriate bodies (Grid Deployment Board (GDB) and the Fabric activity). This work will be done on the version 1.2 software. It involves determining the work to be accomplished by each team at each stage in the process and the overall organisation of the testing team.

## 2.4. ISSUES

- The composition, mission and relationship between test activities need to be clarified as part of the process.
- Definitions exist for WP unit tests + TSTG but not for ITeam, EIP and LCG certification group.
- The process needs to factor in some issues: e.g. System testing and how do we do this?
- The input, output and formal exit criteria should be explicit.
- The tests to be performed need to be made explicit.
- Very few formal tracking taking place. Are we happy with the problem actions and communication mechanisms?
- The LCG certification testbed involves dedicated resources at some regional centers. This needs to be agreed at the Grid Deployment Board. There should only be one certification testbed.
- After step 3, the EDG can continue development level testing on the EDG development testbed environment. This will also be used to reproduce and debug problems identified on the LCG certification testbed.
- The tests timescales are very long. Are these too pessimistic? Can they be shortened?