DataGrid Quality Assurance

On behalf of the Quality Assurance Group

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Outline

- Objectives
- Achievements & Quality Indicators
- Lessons learned
- Future & Exploitation
- Questions

Objectives

- Year 1 - Focus on:
  - Quality of the deliverables – Deliverable procedure – Document management
  - Project monitoring and reporting
  - Software infrastructure: Software release procedure - Central repository - Bug reporting and tracking - Standards and tools
- Year 2 - Focus on:
  - Quality of the software production - Stability of the system
  - Supported by the "Project Quality Statement"
- Year 3 - Focus on:
  - Quality of Services (QoS): Definition and provisioning of Quality indicators

Achievements (1/3)

- Quality organisation
  - As an initiative of the project, the Quality Group (QAG) was created in August 2002 with a Quality representative (QAR) from each WP. The QAG defined and introduced specific measures for the Software Development Process, Quality Assurance (QA) and related issues. The QARs ensured the measures were applied inside their WP.

- Project monitoring and reporting mechanisms:
  - WP Managers weekly meeting (#132)
  - Project Technical Board meeting (every quarter, #16)
  - Project Management Board meeting (every quarter, #16)
  - Quarterly and Annual Reports (#159: 12QR + 144WP QR + 3AR)
    - Has resulted a successful control of the risks, efforts, deliverables
- Quality of the deliverables – Document management:
  - EU Deliverables formal review procedure: (#121 deliverables, 350 reviewers/moderators)
    - Has resulted in the high quality deliverables (all accepted to-date).
  - Document templates (#35)
  - Standard document management tool: EDMS (#600) / CVS

Achievements (2/3)

- Software infrastructure:
  - Central repository - Bug reporting and tracking - Standards and tools: jUnit, Insure, javadoc/doxygen
  - WPs Testbeds, Integration testbed, Certification testbed (LCG), Application testbed, LCG production service
- Quality of the software production
  - DataGrid developer's guide http://edms.cern.ch/document/358824:
    - Packaging - Code Management – Automatic Build system - Environment - Interfaces and API's – Documentation -Test and validation process - Integration procedure - Style and naming conventions
  - Test activities and test automation: test plans
  - Control: release procedure checklist

Achievements (3/3)

- QoS - Quality indicators specifications: https://edms.cern.ch/document/386039
  - Performance indicators

$$E_{crude} = \frac{\text{Number of jobs successfully completed}}{\text{Total Number of jobs submitted}}$$

measured

$$E_{Exec} = \frac{\text{Time while job is running}}{\text{Total time between submission and completion}}$$

$$E_{System} = \frac{\text{Resources Delivered}}{\text{Min (Resources Requested, Total Resources Available)}}$$

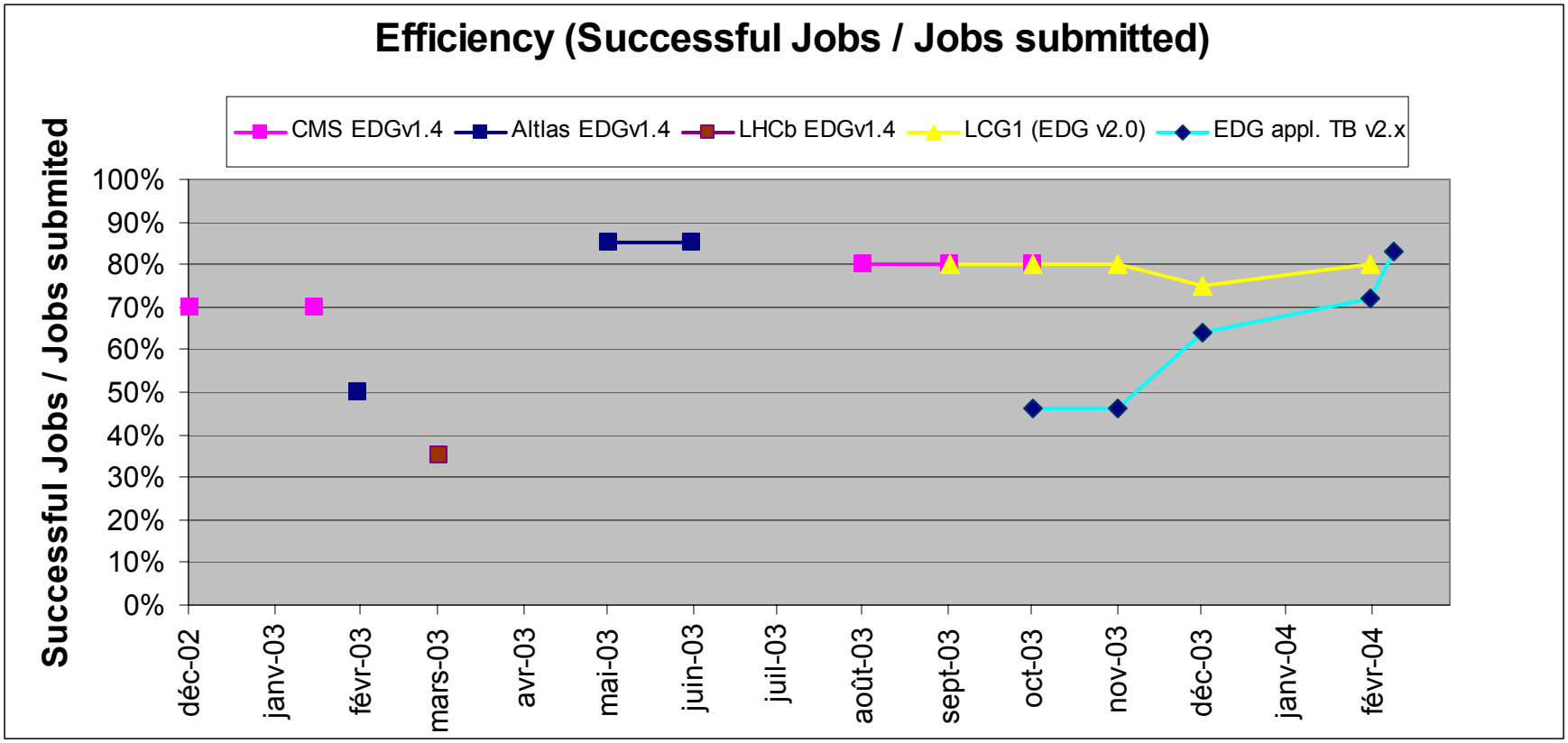
  - Utilisation (does the testbed fit the needs of the applications)
    - Integrated CPU used as a function of user and VO
  - Bugzilla follow-up
    - Number of new anomalies / number of pending anomalies.
    - Percentage of anomalies resolution in each classes of time resolution range (low, medium, high).

measured

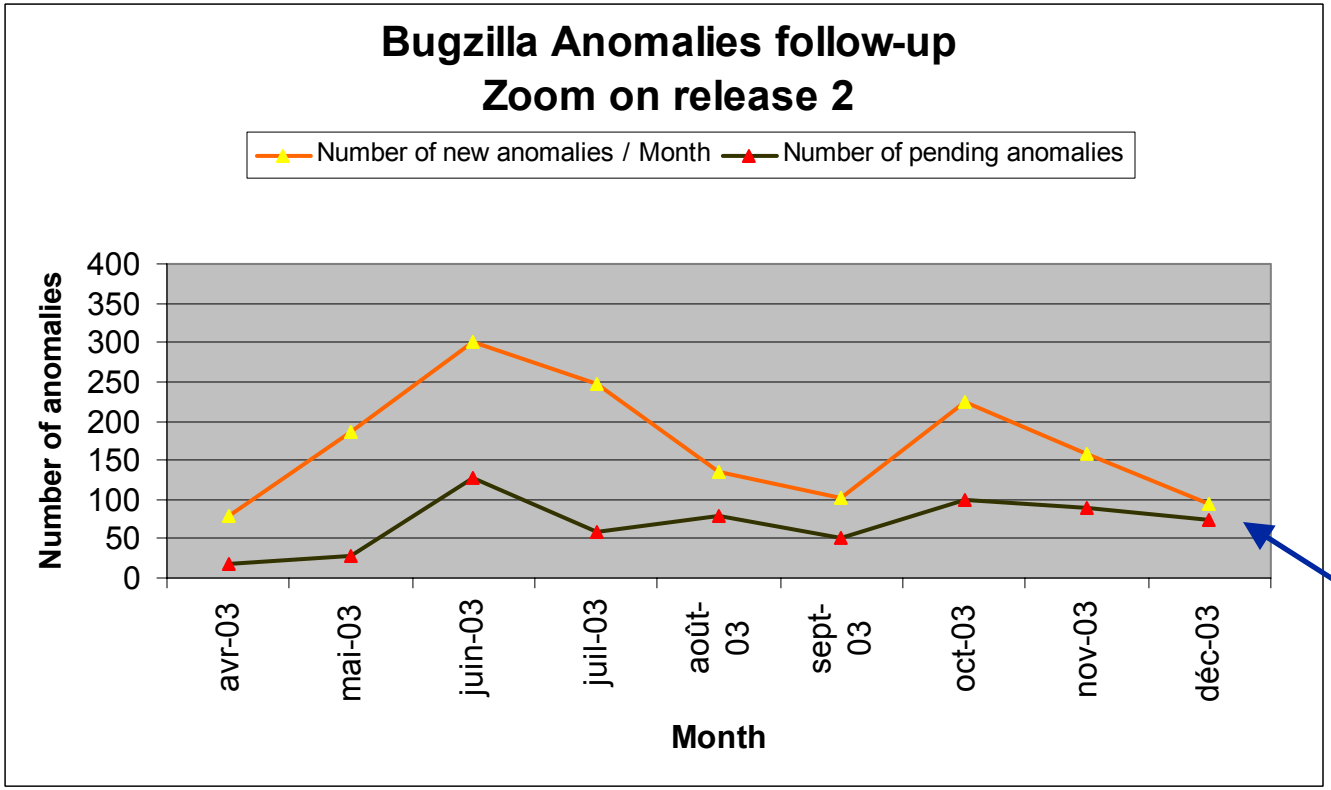
  - User support
    - Percentage of support requests resolved within (x) time - x should be defined (e.g.: 1 hour)

Performance indicators

$$E_{crude} = \frac{\text{Number of jobs successfully completed}}{\text{Total Number of jobs submitted}}$$



Bugzilla follow-up: release 2



No outstanding critical bugs

MTTR(Mean Time To Repair) during the period

Resolution Range	%	Cumulated
1 day	17%	
3 days	21%	
7 days	14%	51%
longer	49%	
	100%	

Lessons learned

- Quality should start at the beginning of the project for all activities with defined Procedures, standards and metrics
- A dedicated testing group is needed to verify all software releases and updates
- Structured and automated verification procedures are needed to ensure the quality measures are applied
- A tool for gathering and managing project reports (e.g manpower and budget tracking) across many partners would reduce the management workload
- Quality indicators should be monitored automatically to have an up to date view of the quality of the services and more resources are required than were foreseen in the EDG project plan

Future & Exploitation

- EDG's Procedures, tools, guides are a good starting point for future projects.
  - Projects such as CrossGrid and LCG have adopted many of the procedures, templates, organisation structures and guides of DataGrid
  - The EGEE project proposal takes many of the DataGrid QA results as a basis.
- Definition of SLAs (Service Level Agreements) and associated Indicators for Grids is a major topic of interest in the community