An object-oriented approach to deploying highly configurable Web interfaces for the ATLAS experiment

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on behalf of the
ATLAS Technical Coordination

Federal University of
Rio de Janeiro (UFRJ)

Signal Processing Laboratory (LPS/COPPE)
diversity of people, practices, technologies, needs and requirements;

high turnover in management positions as well as within the development team;

long-term endeavor:

changes in requirements become second nature
requests in **numbers**

- **over 3000** emails sent to our support contact Atlas.Glance@cern.ch since August 2011 (an average of 67 emails per month);
- **almost 800** tickets closed in trac over the course of 4 years. Punctual changes of the system’s rules represented the overwhelming majority of all requests.

**JIRA**

since September 2014

- **199** issues
- **125** tasks
- **33** bugs

**Tasks** | **Improvements** | **New features** | **Bugs** | **Others**
--- | --- | --- | --- | ---
64% | 17% | 7% | 10% | 2%
How to promptly respond to changes in requirements?

- **Identify** and **anticipate** potential requirement changes in all stages of development;

- **Recycle** and **expand** on existing functionalities to build new ones;

- **Outsource** behavior (rules) to configuration files.

"... adaptive planning, evolutionary development, early delivery, continuous improvement and encourages rapid and flexible response to change."
Front End Engine for Glance

“Glance Information System for the ATLAS Management”, F. Grael et al, CHEP 2010
An object-oriented approach to deploying highly configurable Web interfaces for the ATLAS experiment
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Recycling and Expanding

Inheritance
Polymorphism

OptionInput
Checkbox
Select
Radio
TextInput
TextArea
DateTime
Number

BaselInput
BaseInput
FileInput

Radio
Select
Checkbox
TextInput
TextArea

TreeInput

Generated on 6 Feb 2015 for FENCE by doxygen 1.6.1
Configuration files loaded **hierarchically**, with **local** directives expanding and overwriting **global** ones.
Sensitive data secured through defined user groups, permissions and CERN e-groups.

Native integration with JIRA.

Integrated systems.
SEARCH INTERFACES
(information assessment, i.e., "read")

search parameters and resulting table fully described in configuration file.

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input validation carried out in both client and server sides

- input validation for the Favourite temperature field

- Easy assessment of the rules

- HTML FORMS (write operations)

- ATLAS Registration form

- Last name (LaTeX)

- First name (LaTeX)

- Comments
  - Text cannot exceed 40 characters.

- LaTeX live preview

- LaTeX live preview

- An object-oriented approach to deploying highly configurable Web interfaces for the ATLAS experiment

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CURRENT STATUS

**ATLAS**
- In production
  - Appointment
  - RackWizard (partially)
- Under development
  - Membership
  - SCAB (Speakers)
  - TDAQ (Speakers)
  - Upgrade (Speakers)
  - Papers (Analysis)
  - ConfNote (Analysis)
  - PubNote (Analysis)
  - Traceability
- To be initiated
  - Speakers Committee (Analysis)
  - Thesis

**ALICE**
- Under development
  - SAMS
  - Membership

**LHCb**
- To be started:
  - Membership
  - Traceability

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ATLAS Appointment

Managing appointments

First system to be fully migrated to the Fence framework

ATLAS Appointment

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<tr>
<th>Appointment</th>
<th>Category</th>
<th>Appointed member</th>
<th>Affiliation</th>
<th>Start date</th>
<th>End date</th>
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CERN Accelerating science

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Setting forth Fence’s native support for graphics

ATLAS RackWizard

CERN Accelerating science

The GLANCE Project

report an issue  contact
Majority of changes in requirements do not require any changes in the source code;

Requirement changes can be put in effect immediately by altering the configuration files;

Code recycling and specialization is encouraged by heavily applying OO’s inheritance and polymorphism;
FUTURE DEVELOPMENT

**JSON Web editor**
Friendly interfaces where authorized users can edit the configuration files and see the effects immediately.

**Notification center**
Node.js + MongoDB real time solution to inform logged users about pending actions and alert when sensitive data is changed.

**Enhanced statistics**
Native support for displaying pie-charts, histograms, etc in compliance with Google's Visualization API.

**Comprehensive history**
Extensive use of logs and history tables for complete traceability of changes in data and in requirements and the possibility of performing rollbacks.

**Automated testing**
Unit testing with phpUnit.