ValDb: an aggregation platform to collect reports on the validation of CMS software and calibrations

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**PdmV group and ValDb service**

Physics Data And Monte-Carlo Validation (PdmV) is a group of PPD inside the CMS experiment. PdmV tasks include evaluation of physics performance and validation of Monte Carlo and datasets. ValDb is a system for collecting validation reports from various sources. ValDb is well suited for CMS validation because it is easy to use, has an intuitive interface, and can handle large amounts of data.

Validation campaign gets validated by comparing target and reference validation samples produced for that purpose. Automatic sample comparison is done with RelMon® and validation contacts needs to check the RelMon report and fill their report into ValDb. Each release added in ValDb can be linked to RelMon report.

ValDb has three types of users:

- guest user - can only read reports,
- validation contact - has permissions to read data and edit only their area in release report,
- admin – is able to read all data, add a new release and new users, modify and put validation reports.

Each software release cycle is organized in campaign to ease following the changes cycle and keep all information in one place. Users can check all changes in detailed information for single area and see how validation evolved from 'NOT YET DONE' to current state.

Web interface with the help of JavaScript and HTML5 capabilities is bookmarkable and can be shared by different people or saved for reference in documentation.

ValDb has a build announcement capability to send e-mails to concerned HyperNews forums building up a threads of email on a given validation campaign. Further discussion with expert can then happen directly in HyperNews to solve issues. Sub-threads are created by sub-categories. This lets users to be informed directly to their pages.

**Used tools**

- **AngularJS** is a JavaScript framework useful with two way data binding and dynamic data representation. Making each HTML page to be few hundreds lines, creating reports tables dynamically.

- **Twitter Bootstrap** is a HTML and CSS templates allow to create tidy and responsive web pages in almost no time. ValDb interface uses its CSS and modal pop-up to display detailed information.

- **CherryPy** is a Python web framework. Serving HTTP files and managing user requests. Simple way to access HTTP request headers and data.

- **Python** is a high-level programming language. Used to parse user requests and return data in JSON format. Send emails over SMTP protocol, connect to database and logging.

- **Oracle database** used to save user reports. DB schema allows to save newest reports and snapshot of previous report points.

**ValDb interface**

Admin interface showing CMS/SW_6_2_0 release cycle. Making it easy to draw overall conclusion on the outcome of validation campaign. Displaying all functions: add new release, new user, find users, remove user.

By click on icon, detailed information is displayed in Twitter Bootstrap’s modal. Showing user comments and links to validation plots, date when validation contact put ones report. The evolution of report can be check by clicking on older revision.

**ValDb operations**

- User database is synchronized every hour by a python cron job. It takes user credentials (username, email) from validators e-groups and HyperNews.
- Admin adds new release to ValDb for validation. Entry can be linked to external RelMon report.
- ValDb announces new release via SMTP protocol to validation HyperNews. The announcement message is an starting message for threading and any discussions about validation.
- The validation status of newly added release is by default set to NOT YET DONE.
- Validation contacts puts their validation report and changes status of validation. ValDb sends a reply message to HyperNews, using ‘In-Reply-To’ header inside e-mail to keep threaded structure inside HyperNews forum.
- All reports are filled and admin is able to summarize all information and perform a wrap-up.

**Possible upgrades**

- Automaticatization of new release addition with minimal human interaction.
- Better integration with RelMon.
- Possibility to edit the link to RelMon report.
- Adding sub-categories dynamically.
- RESTful interface to get information about validation campaign.

[1] RelMon is a tool to automatically compare two sets of samples and produce a report. For further information see: http://iopscience.iop.org/1742-6596/368/1/012008