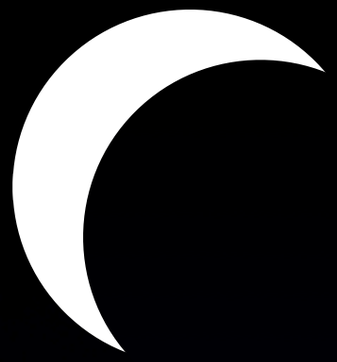


How to build a home-page in 30 nights

OR: Developing a auto-validating web-application using AJAX and Python for configuring the PH/SFT Nightly build system

26. Aug 2008 | CERN PH/SFT | Morten Dam Jørgensen | mdj.dk | mdj@mdj.dk

<elements of=”talk”>

- Introducing the Nightly Build System
- My project
  - Goals
- Implementation
- Structure
- The result

The Nightly Build System

- Provides daily builds & tests of LCG-AA software
- Multiple architectures (Linux, OSX, WinX86...)
- Configuration of the build process is read form a XML document, edited by hand:
  - Possible content errors (wrong tag name, e-mail etc)
  - Syntax errors in the XML causing total build failure
  - Other practical obstacles for the everyday user (location, file version etc)

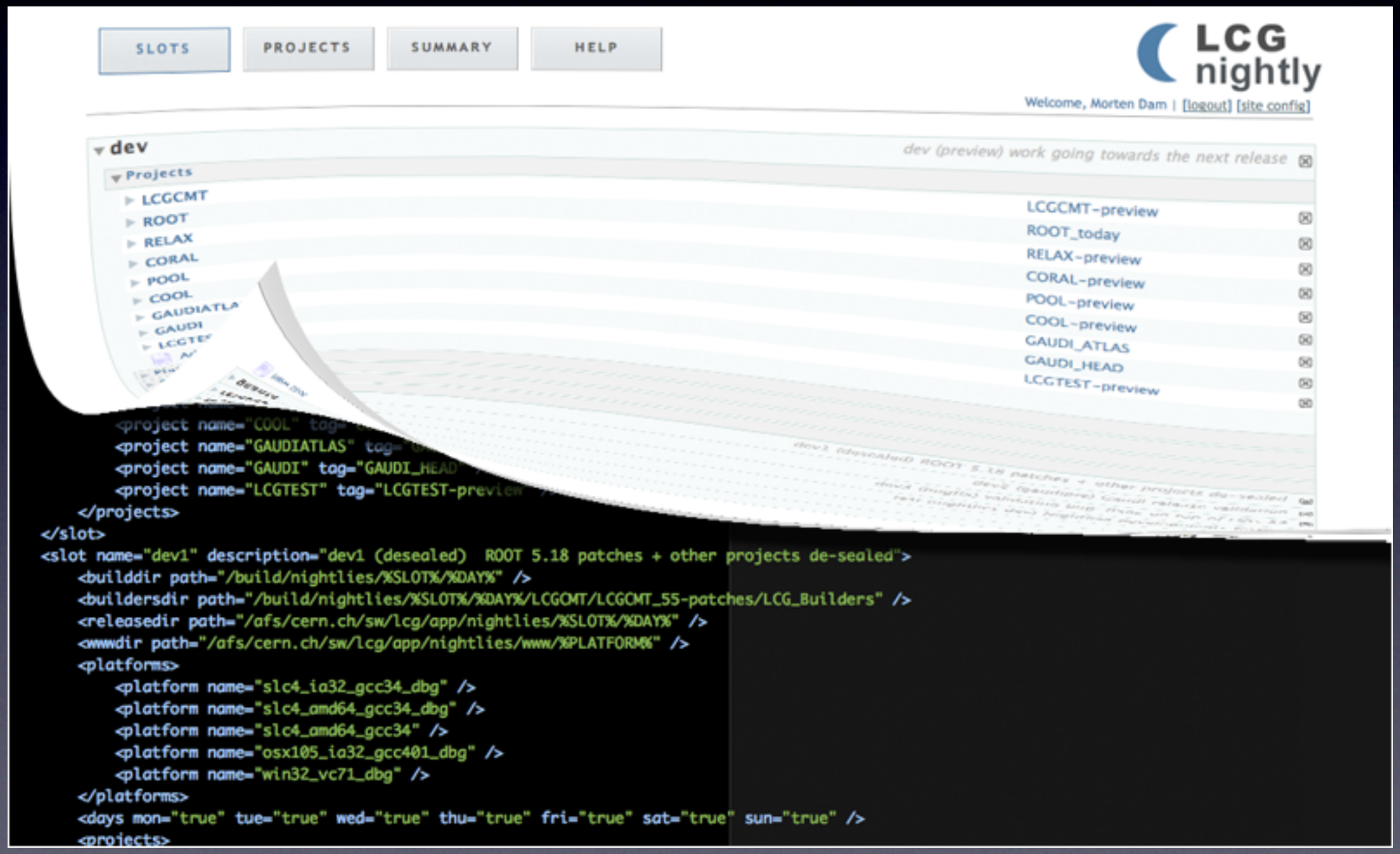
My Project

- Implement a configuration tool for the Nightly Build System [NBS]
- Web-based
- Various LCG-AA and LHCb requirements

Goals

- Configure NBS over the web
- Standard CERN provided Linux, i.e. slc4 for the time being
- Validation of critical input
- Cross-browser / platform
- Extendable without too much trouble.
- Well documented (both for users and developers)
- Plug-in structure for adding specific repositories
- Authentication
- Reliable output
- [LHCb]: Fine grained access control
- [LHCb]: Time lock (doing build)
- [LHCb]: Additional elements

Implementation



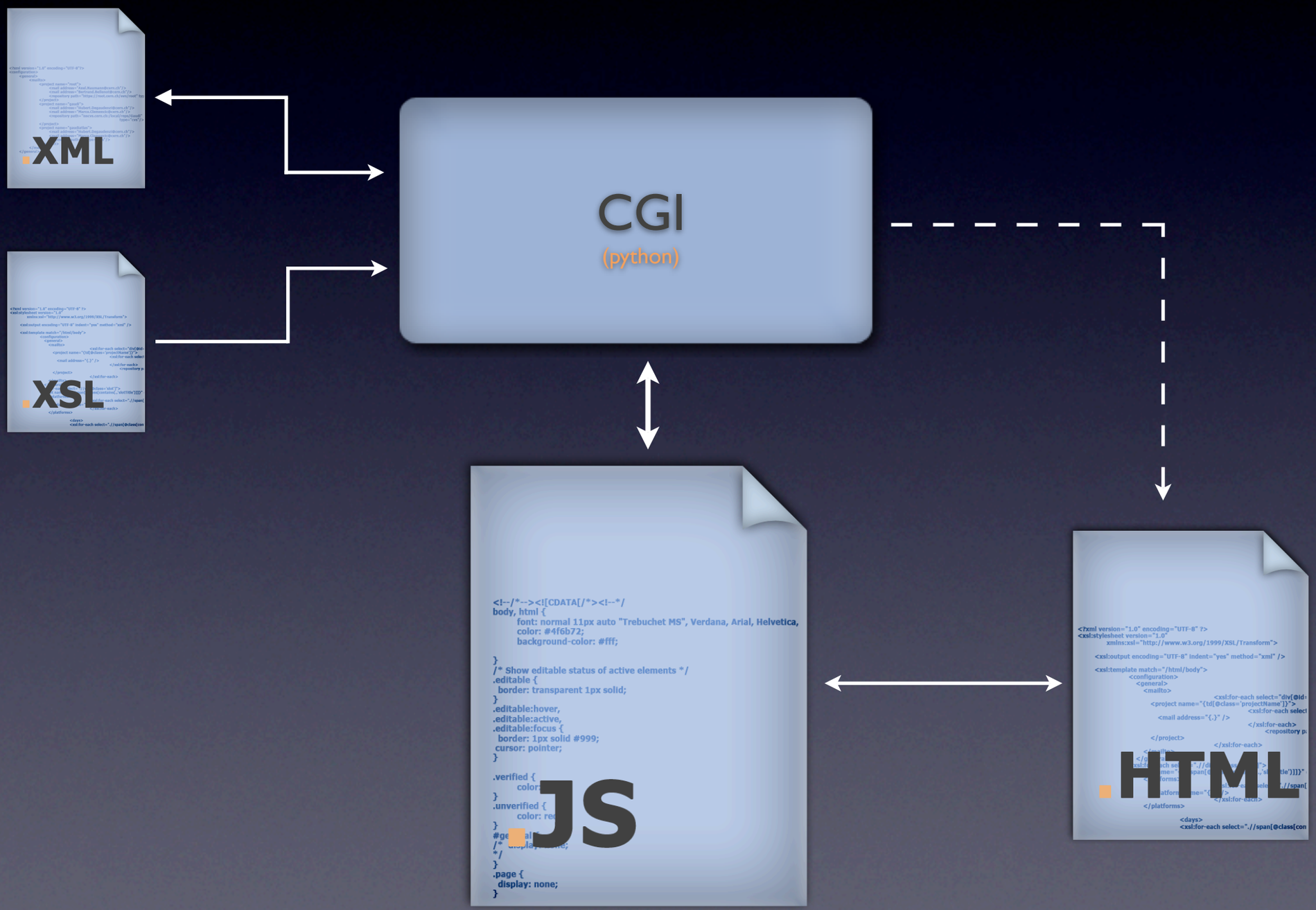
Client side features

- jQuery Framework: Cross-browser JS, adds abstraction to browser specific javascripting
- Movable, deletable and editable elements – position and edit intuitively
- Interactive feedback on events – makes it possible to use tral-and-error without destroying unsaved modifications at other places in the config.
- Ajax "Behind the scene server calls" – Website acts like a regular application
- Novel handling of validation state – Regions with open input fields means unvalidated data, and hence no submitting. If all data is locked down it means that it is verified.
- Namespaced Javascript for future integration (lcg.nightly.core.*)
- Fine-grained user control (Project-level, Slot-level and Site-level) – LHCb specific. Project contacts can be given partial access to their own builds.

Server-side features

- Site management forwarded to CGI/Python
- Apache 1.3, Python 2.3, IT-dep standard webserver (self-contained app)
- New elements represented as XSL-T for easy extension
- Shibboleth Single Sign-On Authentication
- Central configuration file for both front- and back-end (YAML).
- Plugin-structure for future repository types
- E-mail validation against CERN accounts
- Logging of changes (commit configuration to CVS)
- Configuration is validated as proper XML before saving (parses XSL-T,)

Flow structure



Flow structure in practice

Site configuration

YAML

XML

configuration.xml

XSL

XSL Templates

CGI
(python)

Repository plugins

PY

CVS
SVN
...

PY

E-mail validation
CERN
Phonebook

Ajax (JSON)

XML

XSL

HTML

XML-S

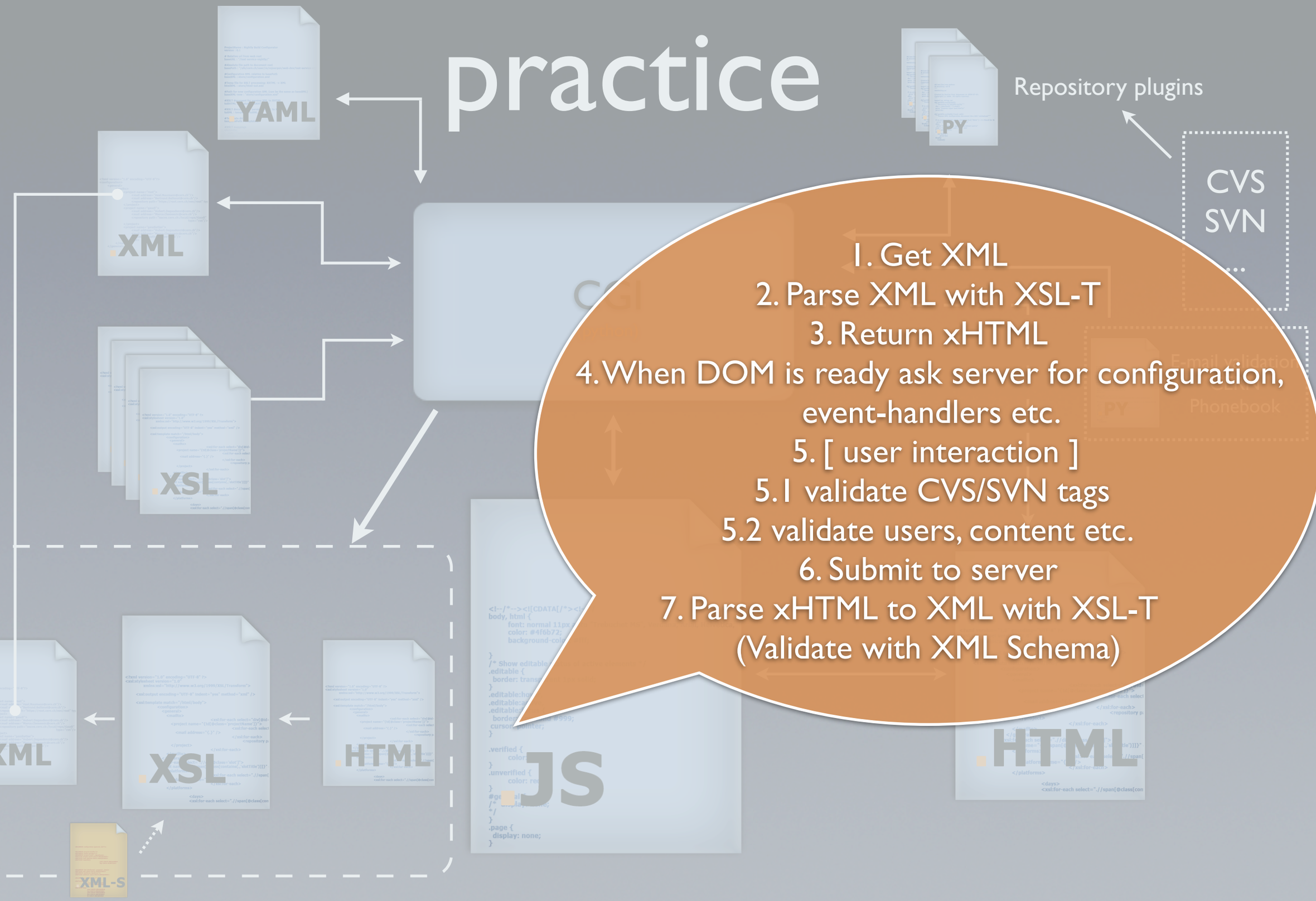
JS

lcg.nightly.core.*

HTML

User interface

Flow structure in practice



Nightly Build Configurator

SLOTS | PROJECTS | SUMMARY | HELP

LCG nightly

Welcome, Morten Dam | [logout] [site config]

- **dev** — *dev (preview) work going towards the ne…*
- **dev1** — *dev1 (desealed) ROOT 5.18 patches + oth…*
- **dev2** — *dev2 (gaudipre) Gaudi release validatio…*
- **dev3** — *dev3 (bugfix) validating bug-fixes on top …*
- **test** — *test (nightlies dev) Nightlies developmen…*
- **release**
- **geant4** — *Geant4 test sl…*

New Slot

Save configuration

The Result

- (advanced) web-application
- Validation of nearly every element in the configuration file = less configuration errors
- Portable (Std. Apache-CGI+Python 2.3 >)
- Well documented (including user and developer guide at the twiki)
- Extendable (simple adding of new parameters)
- Proof of concept for new service mash-ups

Work in progress

- Nearly there... (lim t ->∞ -> 1)
- PH/SFT version: feature-complete
- LHCb version: needs a little tuning
- Internet Explorer compatibility (needs new style-sheet and minor tuning)
- Better signalling (user needs to know what happens behind the scene)

You are welcome...

- Since all members of SFT currently have access through Shibboleth (changes are logged) you are welcome to have a look at the page:

http://cern.ch/lcg-nightly-config

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References

- Nightly Configurator Documentation https://twiki.cern.ch/twiki/bin/view/SPI/NBC-DocOverview
- **Nightly Configurator** http://cern.ch/lcg-nightly-config
- Personal home-page http://mdj.dk
- Company page http://damconsult.dk
- Student job at the Danish National Space Center http://www.space.dtu.dk
- http://www.rummet.dk