



# Plans for the BI Software portal

29/06/2017

**Iason Dimitrios Rodis**



# Overview

- **Background**
  - Applauncher
  - LIDS
  - Useful links
- **New BI Software portal plans**
  - Problems
  - Goals
  - Overview
  - Detailed view
  - Mockups
- **Conclusion & Future work**

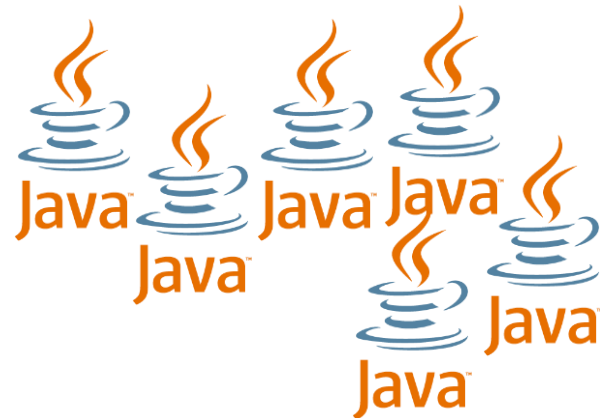
# The Applauncher story...

- In the beginning, there was a BI Software developer called Bob



# The Applauncher story...

- Since the section started producing Java-based graphical user interfaces (around 1997), the **amount** of Java-based software Bob wrote **grew** significantly.



# The Applauncher story...

- In the early days, the **deployment** of Bob's Java applications was trivial.
- All he needed was a single directory under which he could copy the compiled '.class' files.



# The Applauncher story...

- As the complexity and number of applications grew however, access to the applications from a centralised directory became **untenable**. Bob and others in the section therefore moved to use Java's web-start technology.



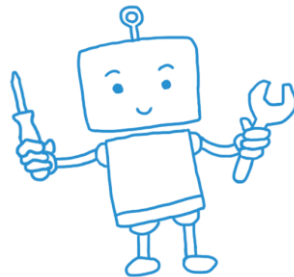
# The Applauncher story...

- By the end of 2004, the section had a large number of web-start files, accessible from a variety of different URLs. Tracking all these files became a headache - Bob had to do something..



# The Applauncher story...

- **Bob developed the *applauncher* taking into account BL-SW's following needs :**
  - To classify, describe and start the applications
  - Make use of the Java web-start technology and extend the JNLP format
  - Standardise the configuration of the applications
  - Add a basic level of security
  - Make the execution platform independent



# Application Launcher

```
irodis@cs-ccr-abbi4:~$ which applauncher  
/user/bdisoft/operational/tools/applauncher
```

<http://bewww/~bdisoft/operational/applauncher.php>

The screenshot shows the 'Application Launcher' web interface. It has a title bar with 'Application Launcher' and two tabs: 'Launch' (selected) and 'Edit configuration'. Below the tabs are two main sections: 'Select running domain' and 'Configure Java Web Start'. The 'Select running domain' section has buttons for 'Development' and 'Operational'. The 'Configure Java Web Start' section has a button for 'Java Web Start Configuration'. Below these are five dropdown menus for 'Domain', 'ApplicationGroup', 'Responsible', 'User', and 'Building', all set to 'All'. A table titled 'Applications' lists various applications with columns for 'Machine Domain', 'Application Name', and 'Responsibles'. At the bottom, there are input fields for 'Machine domain', 'Instrument class', 'Application name', 'Responsibles', 'Users', and 'Building', followed by 'Launch', 'Launch in same JVM', and 'LaunchTest' buttons.

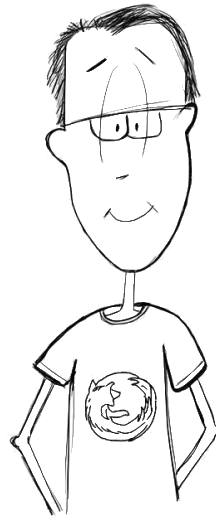
Machine Domain	Application Name	Responsibles
EAN	BXDWCS	sam
CERN	BGIHVv0	anag
CERN	HDB_Scan	maferr
NONE	LOCALLOG	sbarped
LHC	BCTFRLHC	sbarped
CERN	BGILHCv2	anag
LHC	BRASPLHC	sbarped
NONE	BWSCalibrationPSB	anag
CERN	BPMCalibration	sbarped
LHC	BSTLHC	ljensen
PSB	BPMBEAcquisition	atopalou
EAN	BXCETS	sam
NONE	BWSINJLIGHTPSB	sbarped
CERN	FESAGraphEditor	atopalou
CERN	BQSBExpert	sbarped
CERN	HDB_MoveTool	maferr
EAN	RYSCINTS	sam

Machine domain: LHC  
Instrument class: BFBLLHCDashboard  
Application name: LhcFeedbackDashboard  
Responsibles: irodis  
Users:  
Building: CCR

Launch Launch in same JVM LaunchTest

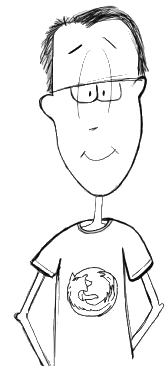
# The LIDS story...

- Bob had a good friend and colleague, **Bill**



# The LIDS story...

- **Among Bill's responsibilities was :**
  - the development of real-time Front End Software for accelerator instrumentation using the FESA framework.
- However, as the number of systems rose, and their complexity was increasing, Bill realised he needed the means to document the systems.
- Not only did he need this to maintain his work, but also FESA documentation had to be accessed by Bob's friends in other groups.
- And thus **LIDS** was **developed**.



# The LIDS story...

- **LIDS :**
  - **L**HC **I**nstrumentation **D**ocumentation & **S**oftware
- **Aims to:**
  - **Classify & Document** FESA classes



# The LIDS

BE-BI-SW Software Section Web Page

Quick Links | Home | Newsletter | Organigram | Contact | Site Map | Help

Domain: **LHC**

**BLMLHC** : Beam Loss Monitors  
General Information [Page released]

Software Contact:  
Stephen Jackson

Instrument: **BLMLHC**

**BLMLHC**

General Information

Software Links

Software Interface

People

Device Details

Document Links

Functional Specification

Interface Specification

Planning

Useful Links

General LHC Information

General

Links

Issues

Timing

CTIM

eLogBook OP LHC

eLogBook BI LHC

Machine Schedule

Machine Vistar

Glossary of Terms

Up-to-date with the LHC Wiki

Other

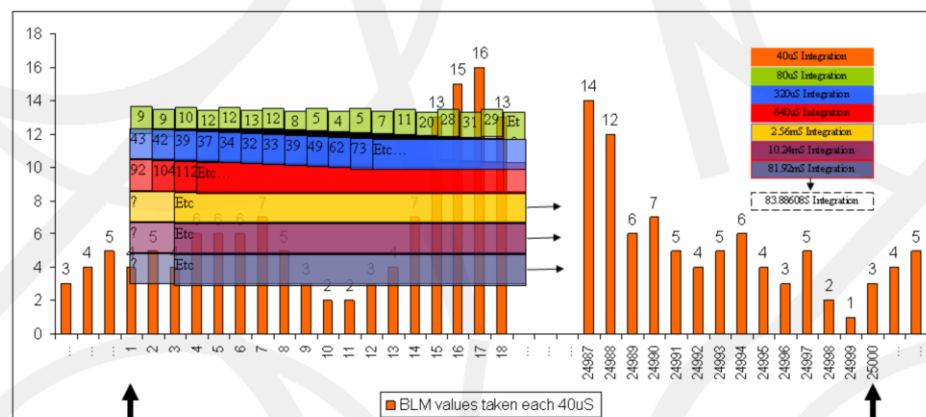
BI-SW EDMS

## BLMLHC : BEAM LOSS MONITORS

### Overview

The primary observables of the Beam Loss Monitoring (BLM) system are the showers generated by the lost beam particles around the machine. They are collected by the approximately 4000 detectors spread all around the rings. These signals are normalized to provide the beam losses at a given point.

For LHC, it is important to integrate these losses over several time windows (40 us, 80 us, 320 us, 640 us, 2.54 ms, 10.24 ms, 81.92 ms, 655.36 ms, 1.31072 s, 5.24288 s, 20.97150 s and 83.88610 s) to protect the machine and prevent quenches. In addition, detailed data must be provided for the XPOC, Post-Mortem, IQC, Collimation as well as on-demand high frequency study data. This specification will give more details of these use cases.



CPU reads the 12 MAX Values at 1Hz. The 1<sup>st</sup> read will contain only zeros. The 2<sup>nd</sup> read will contain the 12 highest values in the second preceding the 1<sup>st</sup> read.  
In the example, the first 4 shown MAX values are 16,31,73,112. These MAX values will be 'published' on the 3<sup>rd</sup> CPU read (not shown)  
Sampling periods are taken as follows : 40µs, 640µs each 40µs, 2.56ms, 10.24ms each 80µs, 81.92ms, 655.36ms each 2.56ms, 1.31072s, 5.24288s each 81.92ms and the rest are taken each 655.36ms  
In the case of the Post-Mortem, Beam-Dump & Study Data buffers, the individual 40µs integrations are returned

The BLMs are meant to:










- Integrate the losses over these predefined scrolling windows all around the machine
- Trigger a beam dump whenever measured losses exceed a given threshold.


# The LIDS classification

**Domain:**












**Instrument:**

**BLMLHC**


-  **General Information**
-  Software Links
-  Software Interface
-  People
-  Device Details
-  Document Links
-  Functional Specification
-  Interface Specification
-  Planning

 **Useful Links**

## General LHC Information

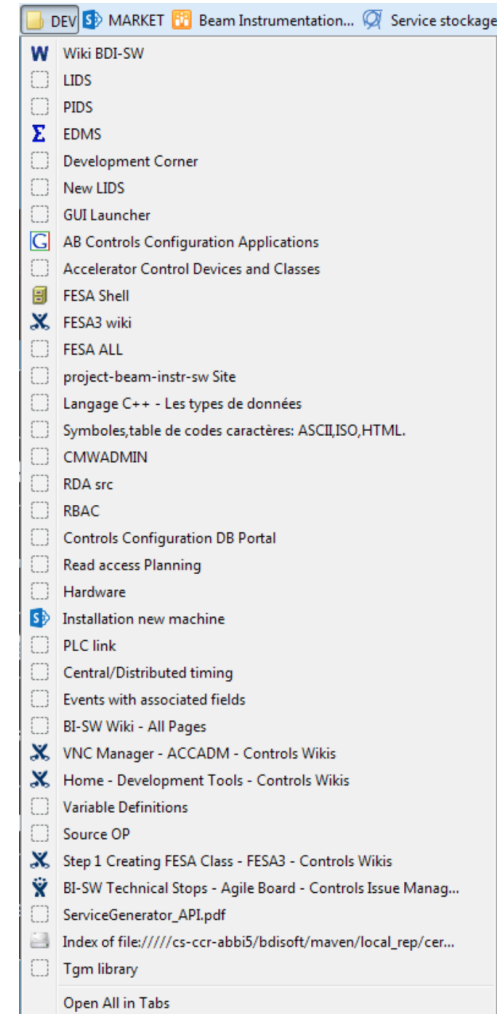
-  General
-  Links
-  Issues
-  Timing
-  CTIM
-  eLogBook OP LHC
-  eLogBook BI LHC
-  Machine Schedule
-  Machine Vistar
-  Glossary of Terms
-  Up-to-date with the LHC Wiki

## Other

-  BI-SW EDMS

# The BI Software portal story

- Following the development of the Applauncher and LIDS, ExpertGUI documentation / deployment, as well as FESA documentation, has been standardised.
- However, general BE tools and services were not organised and could be found in various places.
- Typical BI-SW developer's browser bookmark list
- **Problem:**
  - Links tend to increase in number and change over time.
- The need for a BI **Portal** arose.



# The BI Software portal story

## Useful Links

Control • Timing • Middleware • Java GUI • Wiki •...

CCM BI

Expert GUI :

FESA3 Server :

CCC-LHC : 76677 • CCC-SPS : 70473 • CCC-PS : 76672 • CCC-PSB : 76671 • Phonebook

**Timber** →

**CCM BI** →

**Vistars** →

Diamon	PM	CMW_Admin	Timber	CCM_BI	RBAC	eLogBook	CCM Editor	JIRA
LHC_Sched.	EDMS	Inj_Sched.	BE-BI	CCM	Timing	FESA3	Kibana	CDS
FESA2	BI-SW_Wiki	Vistars	CCDB	Wiki	Applauncher	Indico	JAPC & INCA	JAPC

© be-bi-sw

# Areas for improvement

- **Applauncher**
  - Difficult configuration & maintenance
  - Not ideal for Maven deployment
- **LIDS**
  - Difficult maintenance
  - Outdated
  - Yet another web page to remember
- Duplication of information

# BI-SW Portal goals

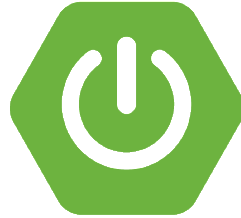
- Improve User Experience
- Update / replace LIDS & Applauncher with **BI Software Portal**
- Correlate FESA and GUI documentation, cross reference information
- Support fixed displays
- Single point of reference
- Need for a new BI Software Portal

# BI-SW Portal Overview

- **Personalised Dashboard**
  - Favourite apps
  - Recent apps
- **Search**
  - Applauncher
  - LIDS
  - Wiki
- **Configuration / Editing**
  - ExpertGUIs
  - LIDS Documentation
- **Useful links**

# Detailed view - Technologies

- **Back-end**
- Spring boot



- **Front-end**
- Angular



- JavaFX webkit



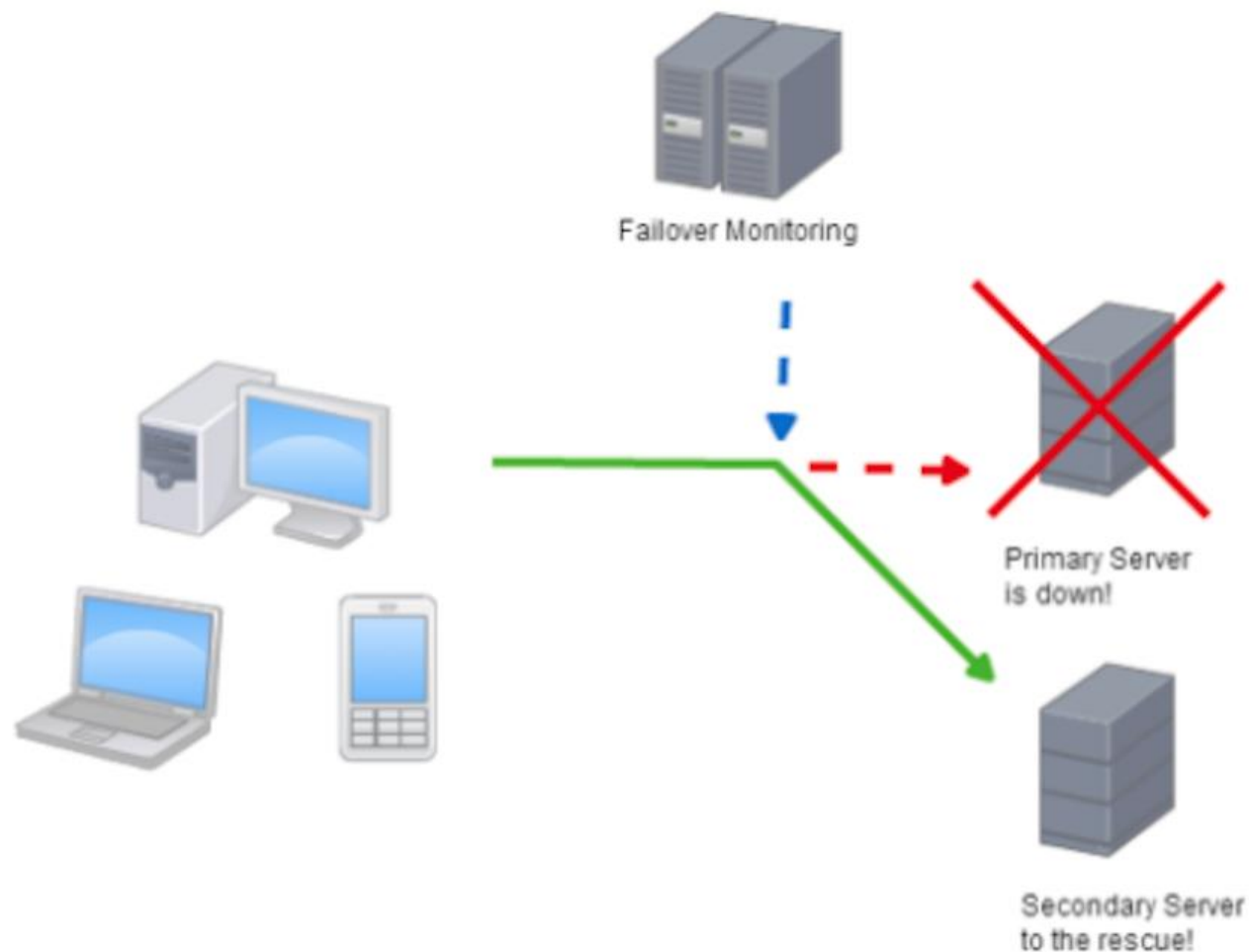
It's about U and I !

- Inspired by the **3rd Developers@CERN Forum**

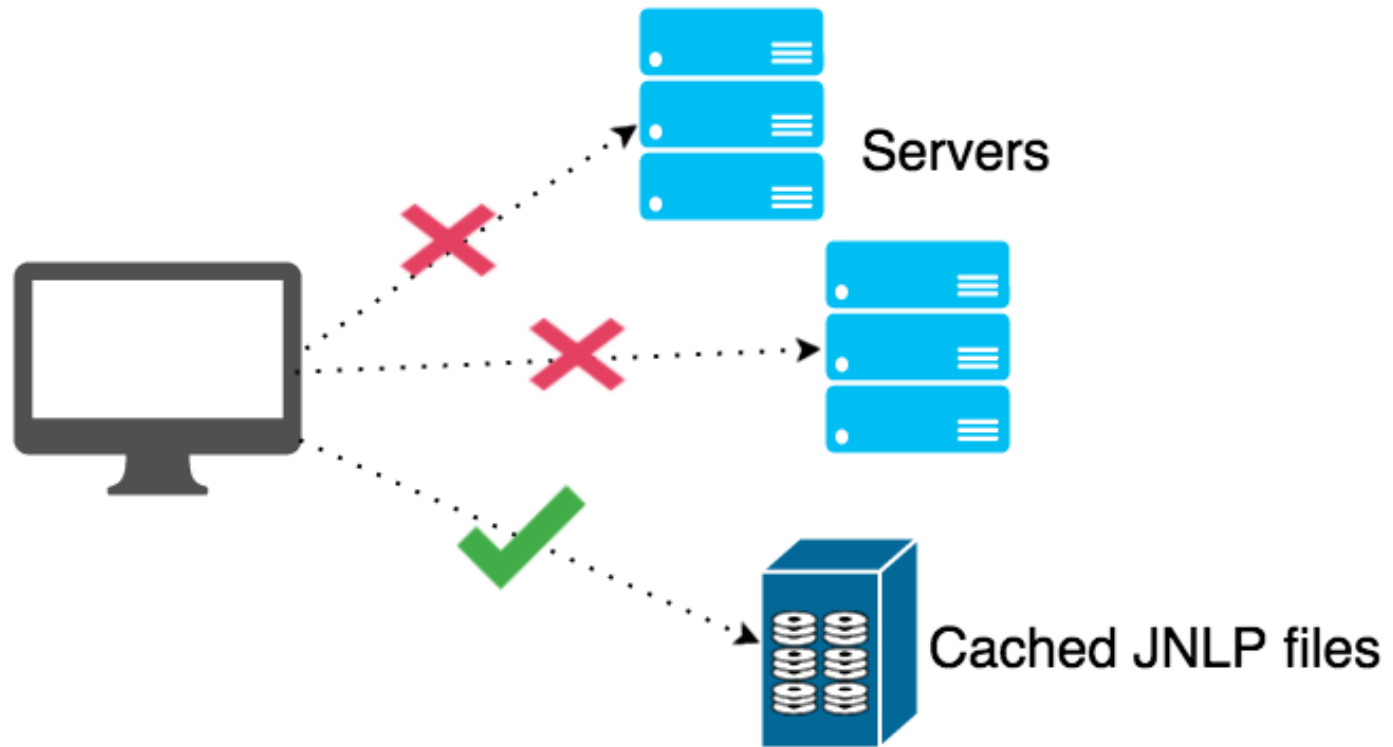
# Detailed view - Technologies

- **Evaluation of the web approach:**
  - **Pros**
    - Cross-platform
    - Single code base
    - Bypass ecosystem rules (mobile for fixed displays)
    - Always updated
  - **Cons**
    - Higher cost of maintenance
    - Availability can be more difficult

# Failover solution

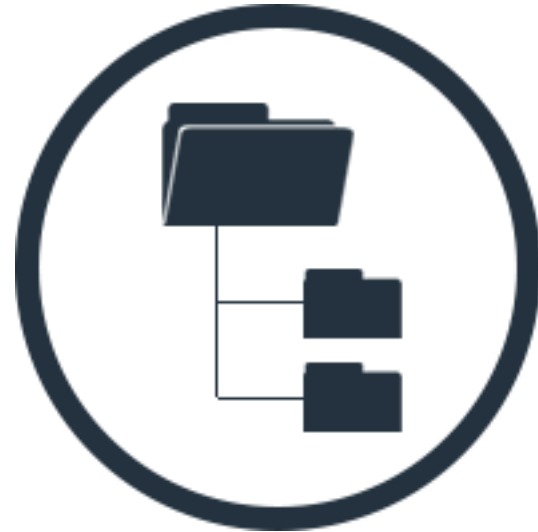


# Detailed view - Availability



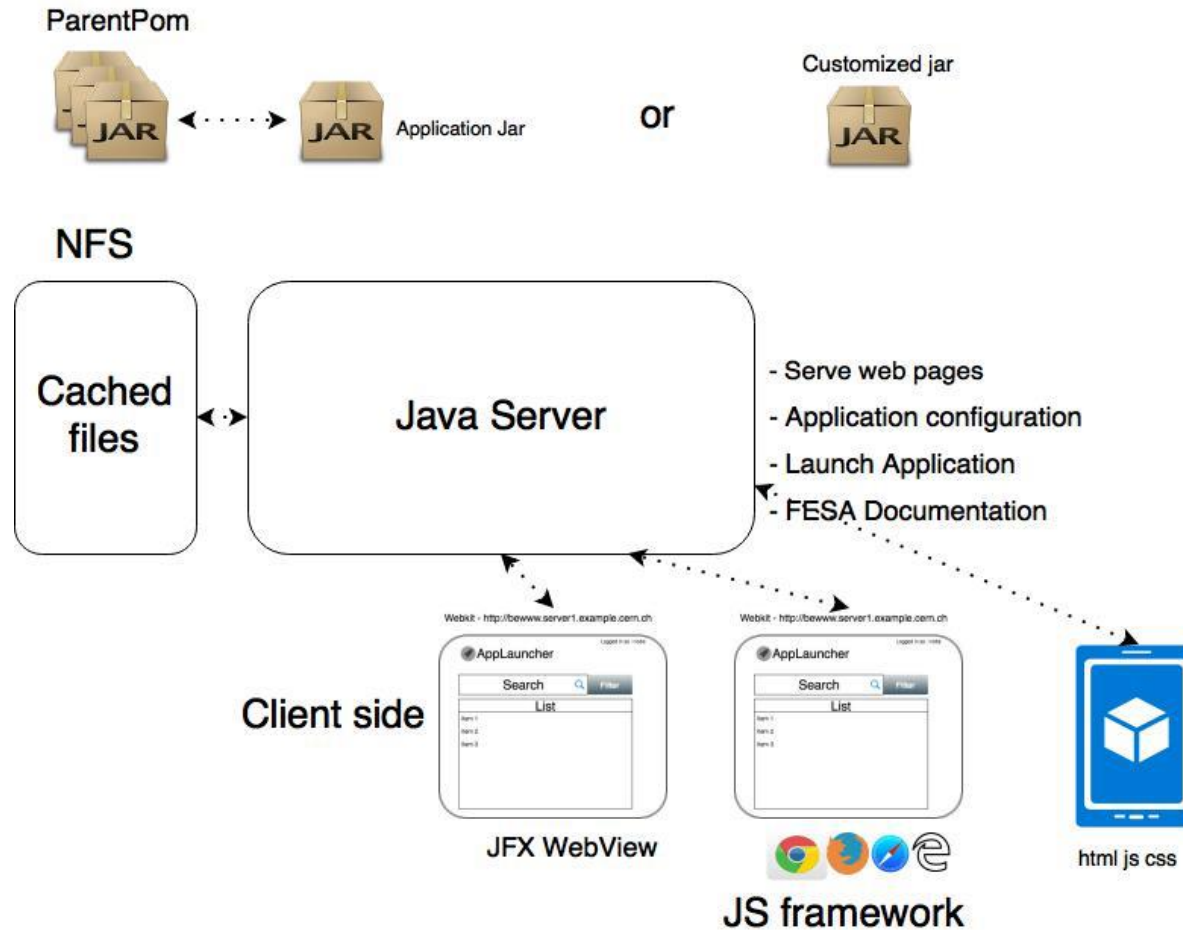
# Detailed view - “Offline mode”

- In case of server failure (even in failover mode) an **“offline mode”** will be provided.
- The servers will frequently **cache** data
- Ensuring **access** to BISW applications **24/7**



# Detailed view - Applauncher

## Dependency Management



# Detailed view - new “LIDS”

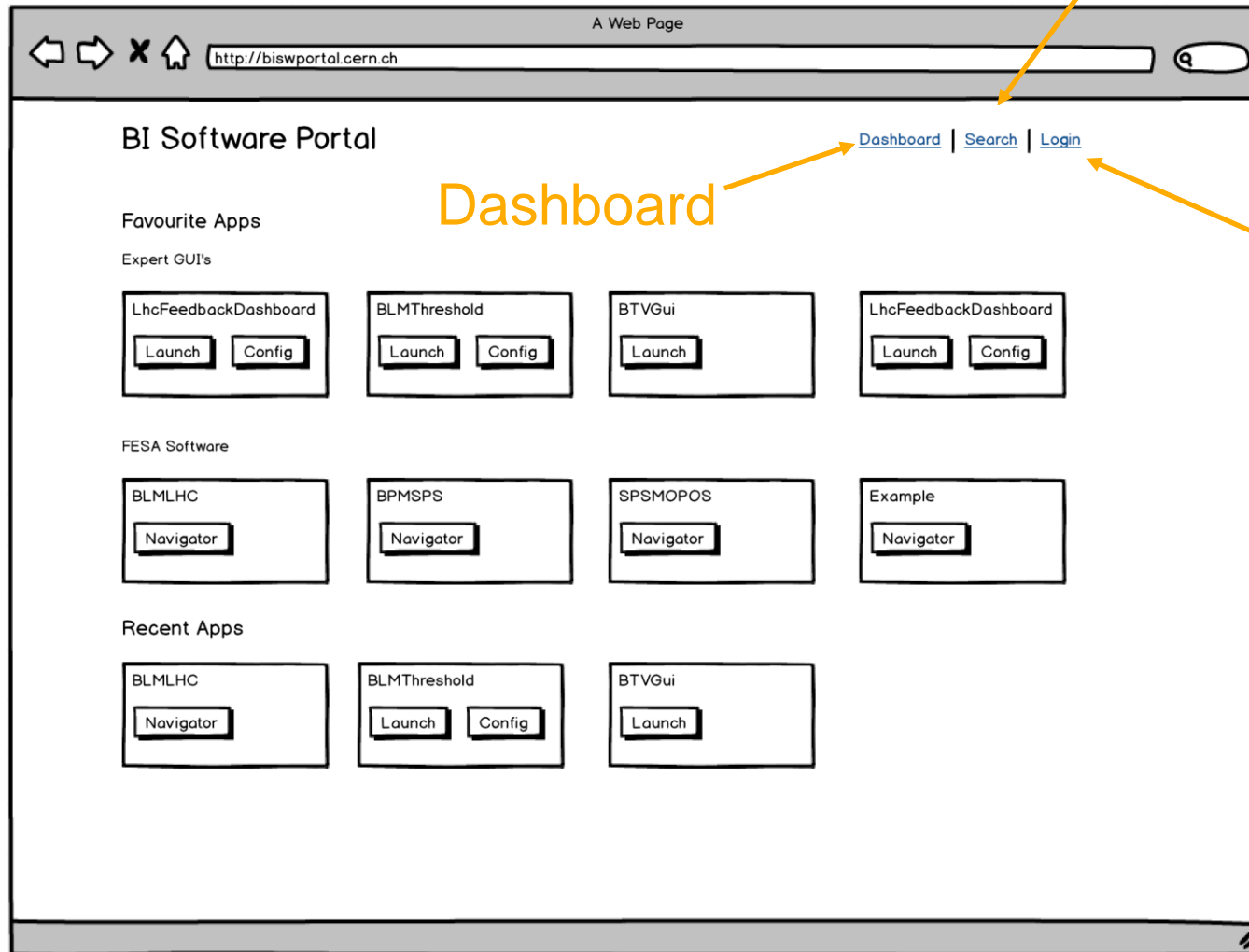
- **Filter by :**
  - Domain
  - Instrument
  - Responsible
  - User
- **General Instrument Info:**
  - Instrument
  - Description
  - SW Contact
  - FESA Class
  - State

# Detailed view - new “LIDS”

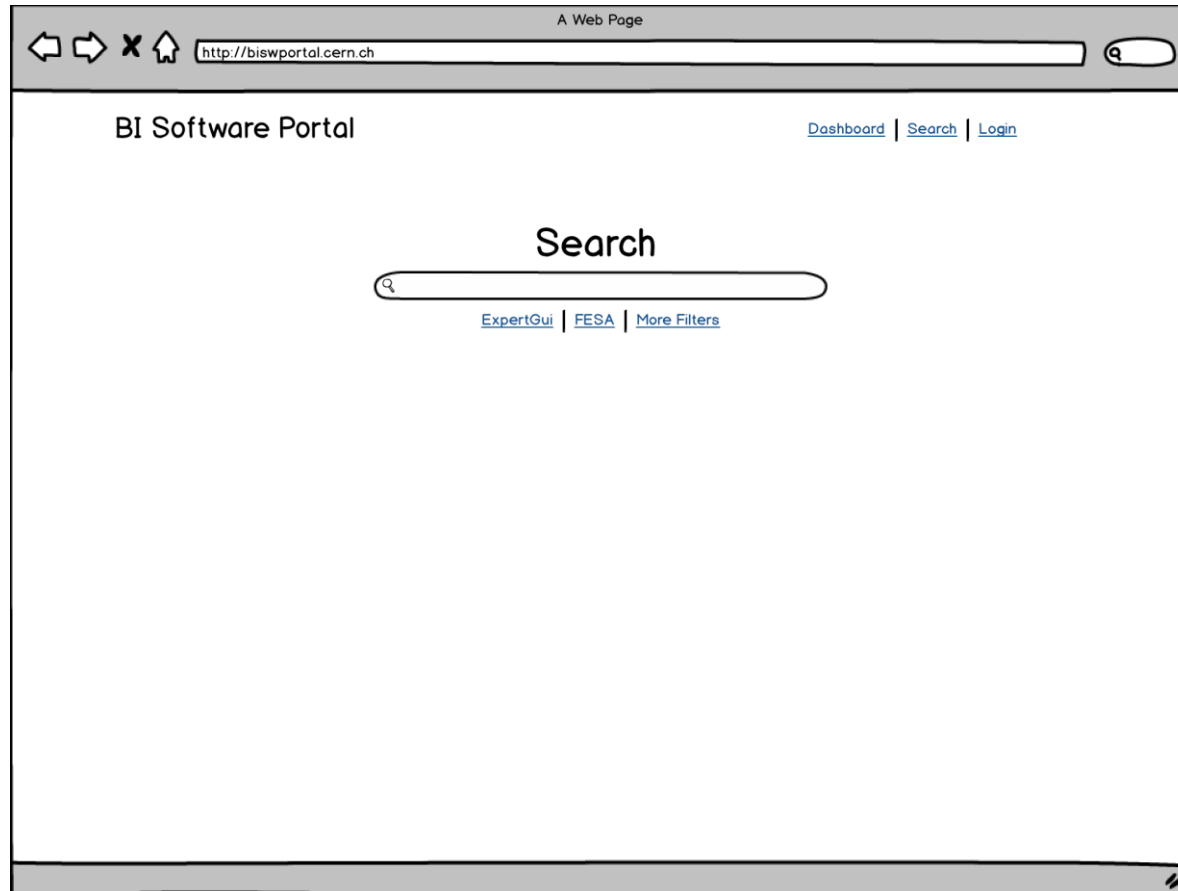
- **Overview**
  - Instrument Use (guidelines)
  - FESA class(es) Graph (auto-generated when delivering)
  - API (auto-generated when delivering)
  - SW Links (Expert GUIs etc...)
- **People**
  - SW, HW (from egroups)
- **Device Instances (table view - CCDB)**
- **Jira links**
- **Version Control links (svn, git links)**
- **Documents links (EDMS)**
  - Functional & Interface Specifications
- **General Domain Info: (additional side-goodies)**
  - Timing
  - elogbook Domain OP, BI
  - Machine Schedule
  - Vistar

# Mockups

# Portal Dashboard



# Portal Search



# Portal Search - ExpertGUI

BI Software Portal

[Dashboard](#)

[Search](#)

[Log in](#)

## Search



[ExpertGUI](#) ▾

[Responsible](#) ▾

[User](#) ▾

[More Filters](#) ▾

## Results

Expert Gui	Responsible	User		
Bpm Calibration	Iason Rodis (irodis)	Diogo Alves (dlouroal)	<a href="#">Launch</a>	<a href="#">Edit</a>
Lhc Calibration	George Smith (gsmith)	Stephen Self (sself)	<a href="#">Launch</a>	<a href="#">Edit</a>
MOPOS Calibration	Stephen Jackson (sjackson)	Stephen Jackson (sjackson)	<a href="#">Launch</a>	
Example	Example	Example	<a href="#">Launch</a>	<a href="#">Edit</a>
Example	Example	Example	<a href="#">Launch</a>	<a href="#">Edit</a>

# Conclusion & Future work

- **Introduction to the concepts of:**
  - Applauncher
  - LIDS
  - Useful links, first “portal”
- **Detailed description of new BI Software documentation plans**
- **Future work**
  - Implementation
  - ExpertGUI creation within the portal from the new component-based javafx applications
  - Investigate the possibility of launching Python applications

# Thank you

