

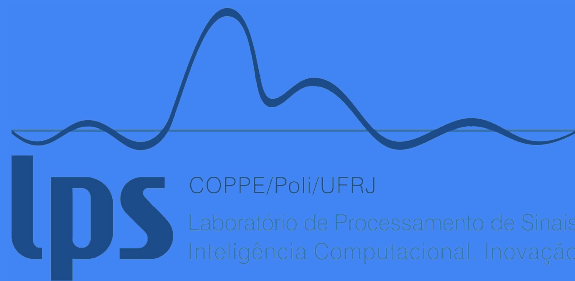
# The migration to a standardized architecture for developing systems on the Glance project

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DO RIO DE JANEIRO





The Glance Project logo

## The Glance Project

- Active since 2003
- Used by 3 CERN experiments
- +20 web systems

The FENCE (**F**ront-end **EN**gine for gla**NCE**) framework

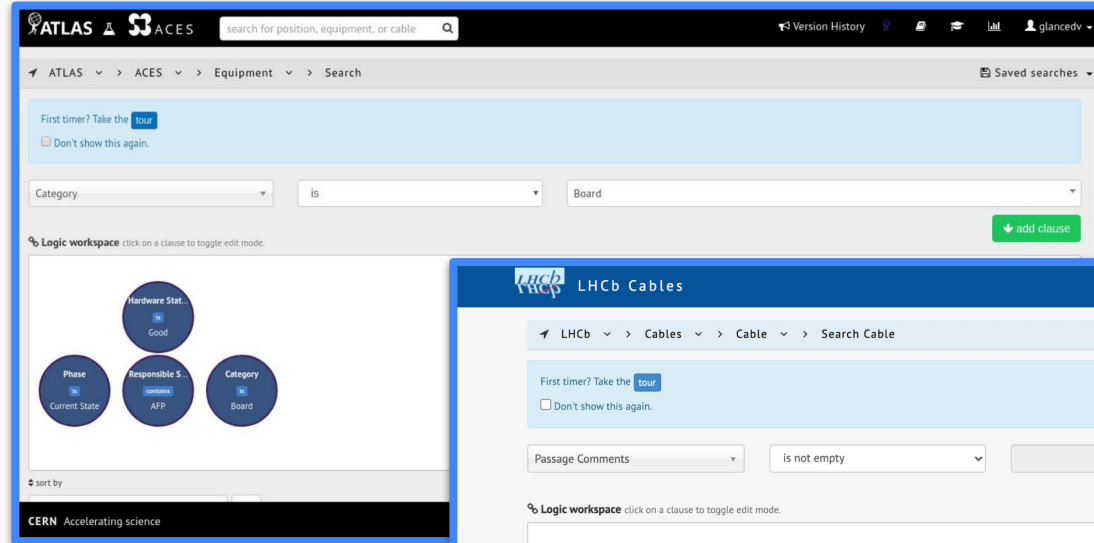
- Easily configurable with the use of .json files
- First attempt at a standard on the Glance project

```
$fence = new \Fence\Fence();  
  
$dbmanager = new DBManager();  
  
$fence->add_content(  
    new CableSearchInterface(  
        "cable_super_search_model.json",  
        "cable_super_search_view.json",  
        "source/cable.json",  
        $dbmanager  
    )  
);  
  
$fence->render();
```

Fence framework

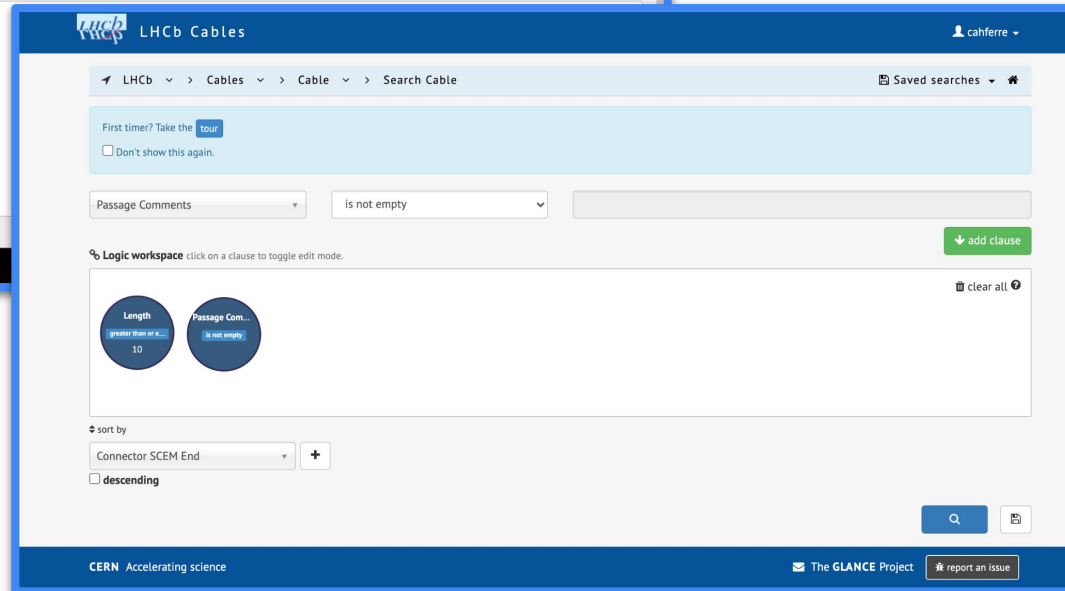
The screenshot shows the 'LHCb Cables' web application. The header includes the LHCb logo and the text 'LHCb Cables'. A user profile 'caherre' is in the top right. The breadcrumb navigation is 'LHCb > Cables > Cable > Search Cable'. A 'Saved searches' dropdown is also present. A light blue banner asks 'First timer? Take the tour' with a 'tour' button and a checkbox 'Don't show this again.'. Below this is a search form with a 'Serial Code' dropdown, a 'contains' dropdown, and an empty text input. A green 'add clause' button is to the right. A section titled 'Logic workspace' with a note 'click on a clause to toggle edit mode.' contains a large empty box and a 'clear all' button. At the bottom, there's a 'sort by' section with a 'Connector SCEM End' dropdown and a '+' button, and a 'descending' checkbox. A search button and a print icon are at the bottom right. The footer contains 'CERN Accelerating science', 'The GLANCE Project' with an email icon, and a 'report an issue' button.

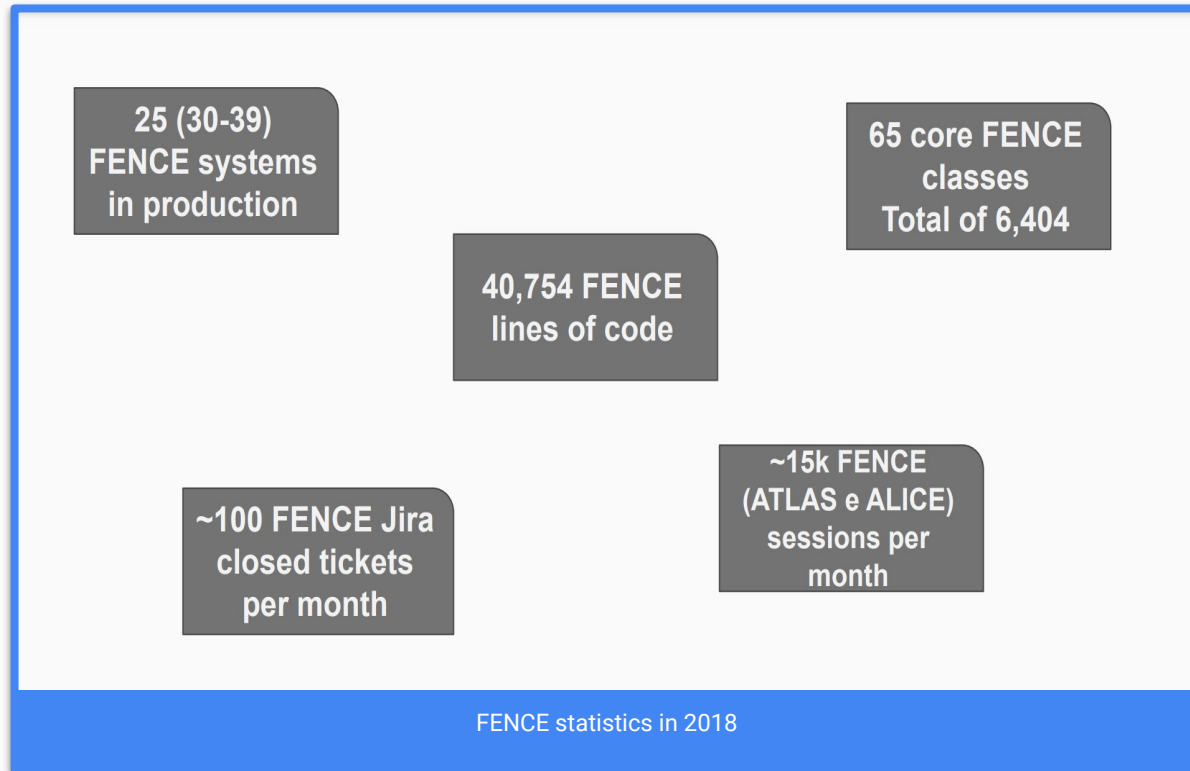
# FENCE - Issues



## ! Issues

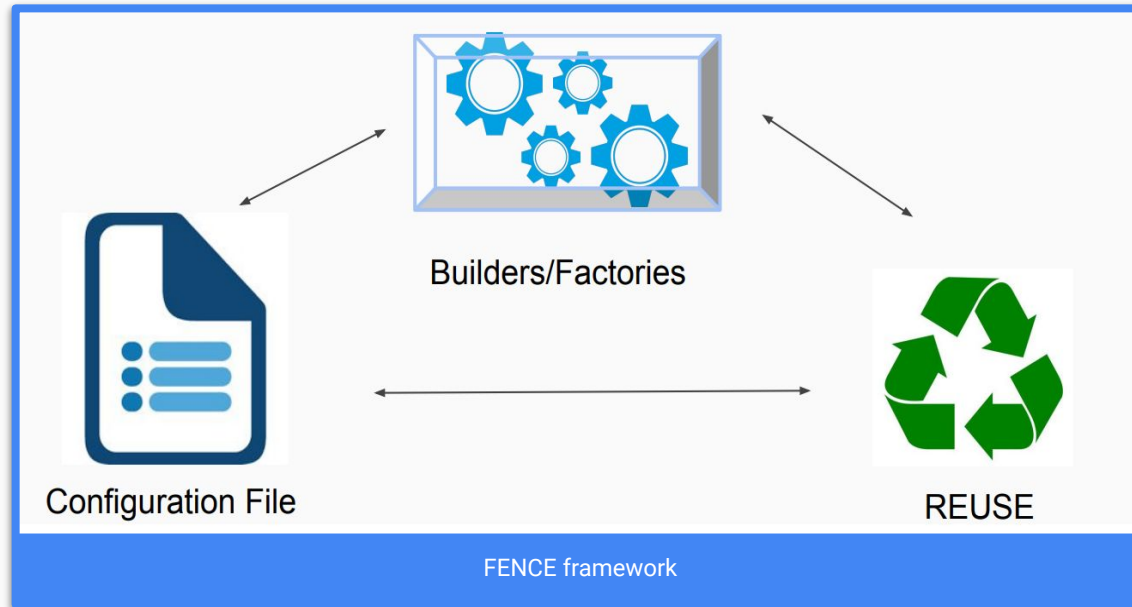
- Limited customization





## ⚠ Issues

- Lack of documentation



## ! Issues

- High coupling
  - not using Glance as an API
  - no separation of concerns
  - in-house built tool used for fetching data

# FENCE - Issues

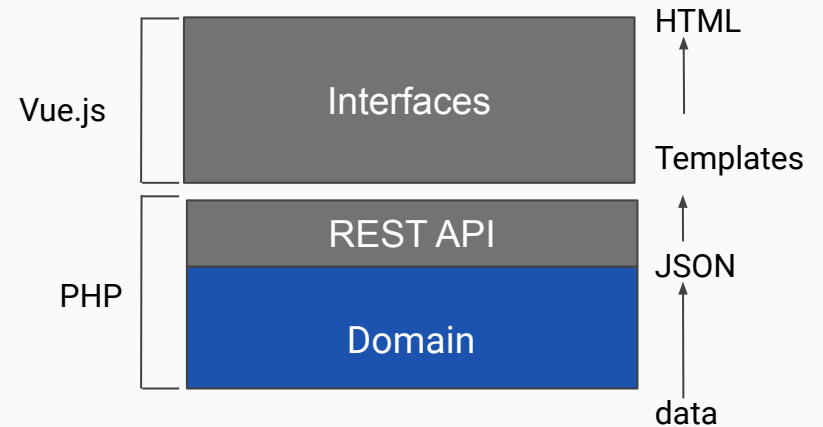
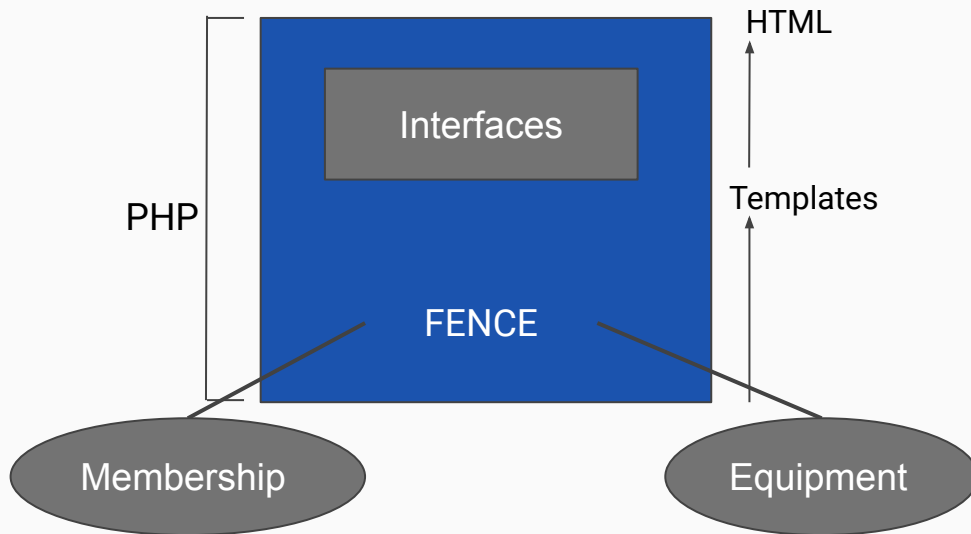
## ! Issues

- Glance's in-house built Object-Relational-Mapper (ORM): FacTree

```
$dbmanager = new DBManager();  
$members = FacTree::envBuild('member')  
->order([  
    'firstName',  
    'lastName',  
    'initials',  
    'membershipAccessId'  
])  
->build($dbmanager, $id);  
return $members;
```

```
{  
  "table": "ME_MEMBER_VIEW",  
  "primary_key": "id",  
  "model": "\\LHCb\\Membership\\Models\\Member",  
  "components": {  
    "firstName": {  
      "column": "FIRST_NAME",  
      "carrier": "setFirstName"  
    },  
    "lastName": {  
      "column": "LAST_NAME",  
      "carrier": "setLastName"  
    },  
    "orcid": {  
      "column": "ORCID",  
      "carrier": "setOrcid"  
    },  
    ...  
  }  
}
```

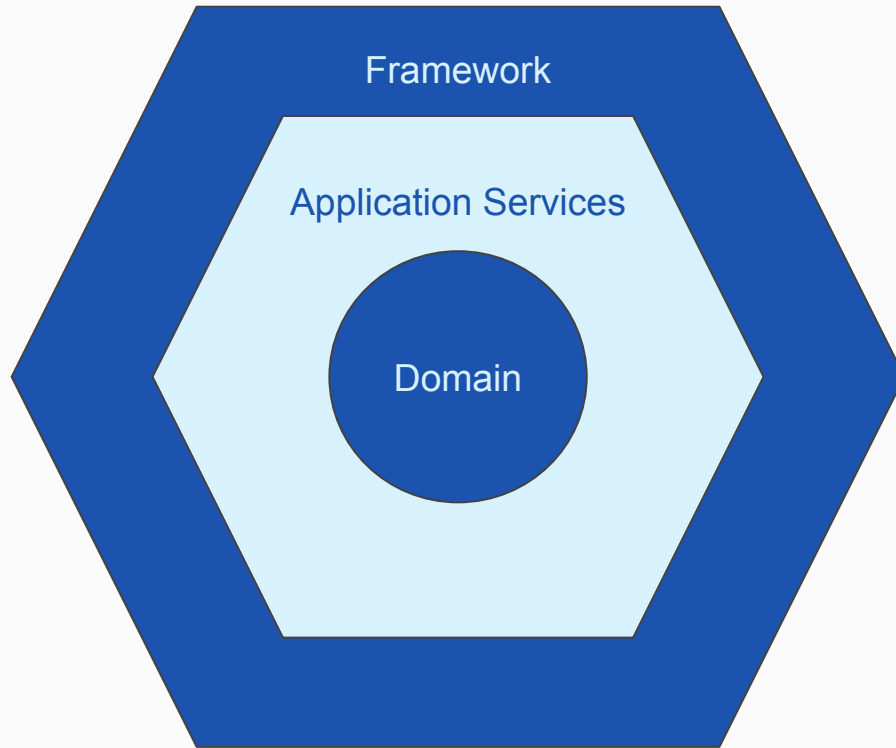
# New architecture



- Hexagonal Architecture
- Backend:
  - REST API
- Frontend:
  - Modular and reusable components

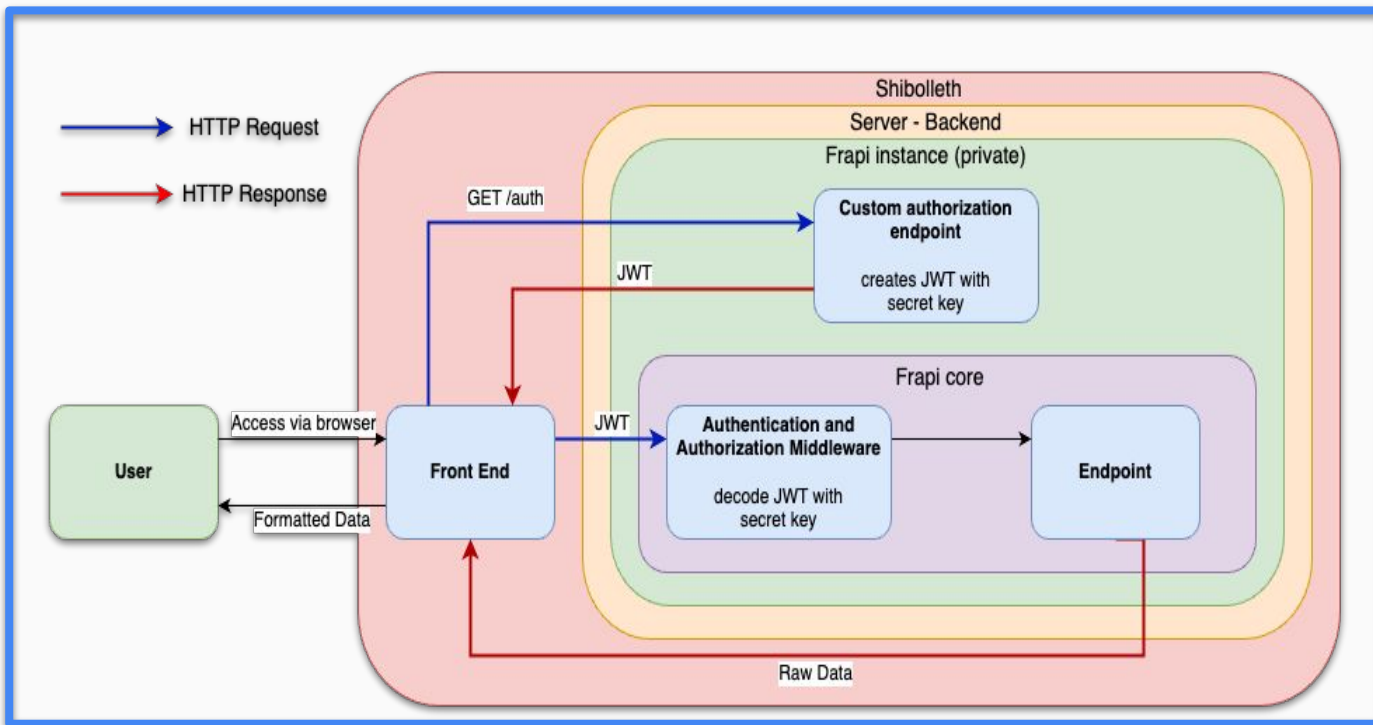


# New architecture



## Hexagonal architecture

- Loosely coupled concerns
- Flexibility
- Scalability



## Backend: FENCE REST API (FRAPI)

- Handling authorization with CERN's services
- Building endpoints
- Logging HTTP requests

# FRAPI authentication

CERN Accelerating science Directory

## CERN Single Sign-On

Sign in with a CERN account

Username

Password

[Forgot Password?](#)

**Sign in**

Or use another login method

☐ Two-factor authentication

☐ Kerberos

By logging in, you agree to comply with the [CERN Computing Rules](#), in particular OCS. CERN implements the measures necessary to ensure compliance.

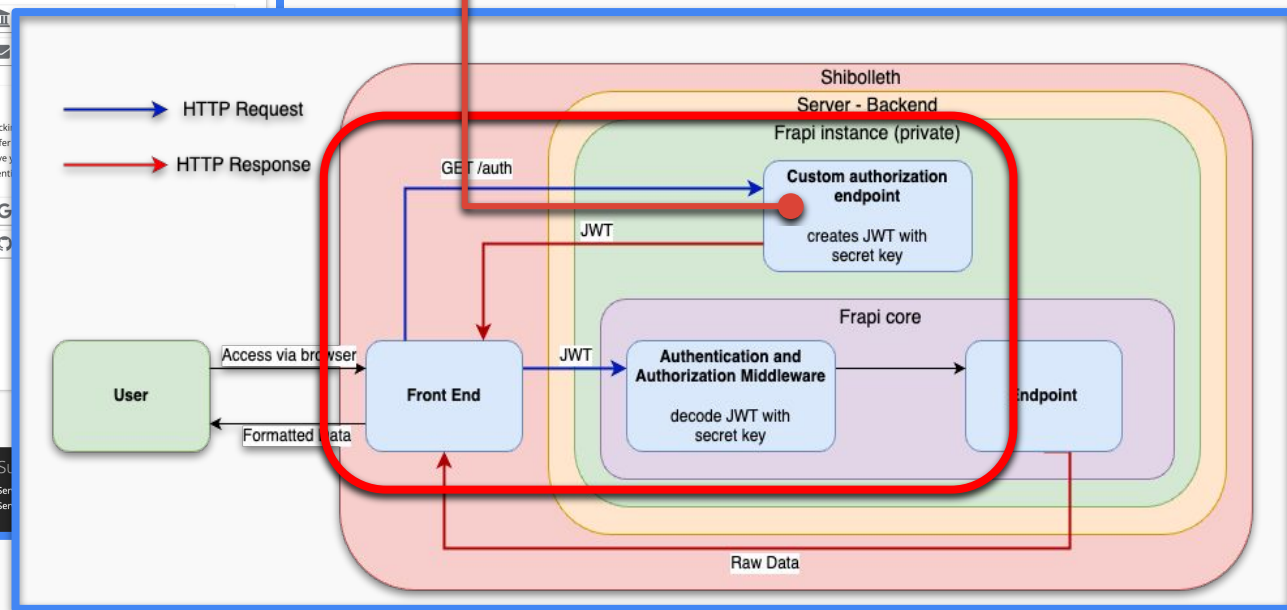
Account  
Manage your account  
Manage your eduGAIN settings

Privacy  
Privacy Notice

Support  
Service Desk

## FENCE REST API (FRAPI)

- Handling authorization with CERN's services



# FRAPI endpoints

```
use Fence\Frapi\Api;  
  
$api = new Api("configuration/api.json");  
$api->setContainer($container);  
$api->run();
```

FRAPI setup

## FENCE REST API (FRAPI)

- Building endpoints
  - Easy setup
  - Highly configurable

```
{  
  "auth": {  
    "sso": "keycloak"  
  },  
  "user": {  
    "class": "LHCb\\Membership\\User"  
  },  
  "endpoints": {  
    "folders": [  
      "configuration/routes"  
    ]  
  }  
}
```

FRAPI configuration file

```
{  
  "type": "controller",  
  "class": "\\Member\\Infrastructure\\Web\\MemberController",  
  "paths": {  
    "/members": {  
      "GET": {  
        "method": "findAllMembersBasicInformation"  
      },  
      "PATCH": {  
        "method": "insertMember",  
        "schema": "resources/schemas/member-update.json"  
      }  
    }  
    ...  
  }  
}
```

FRAPI endpoint example

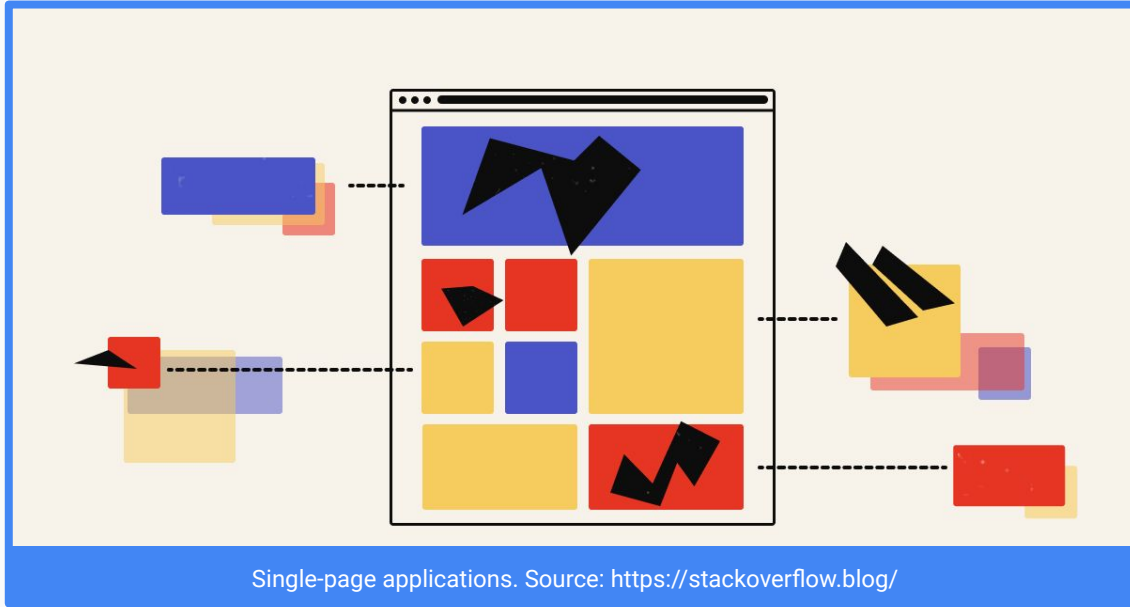
The screenshot shows the LHCb Membership portal for Carlos Brito. The profile includes a photo, email (carlos.brito@cern.ch), and various fields for personal and professional information. A terminal window is overlaid on the bottom right, displaying a series of log entries for an FRAPI request.

**FRAPI Log Entries:**

```
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] Instance ID: FRAPI-6414350af3954
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] HTTP Method: GET
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] Request URL: /membership/api/members/22625
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] Request Headers:
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] --> Host: lbfence31.cern.ch
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] --> Connection: keep-alive
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] --> Content-Length:
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] --> Origin: http://localhost:8080
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] --> User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/111.0.0.0 Safari/537.36
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] --> Content-Type:
[17-Mar-2023 10:38:19 Europe/Zurich] [INFO] --> Accept: application/json, text/plain, */*
```

## FENCE REST API (FRAPI)

- Logging HTTP requests



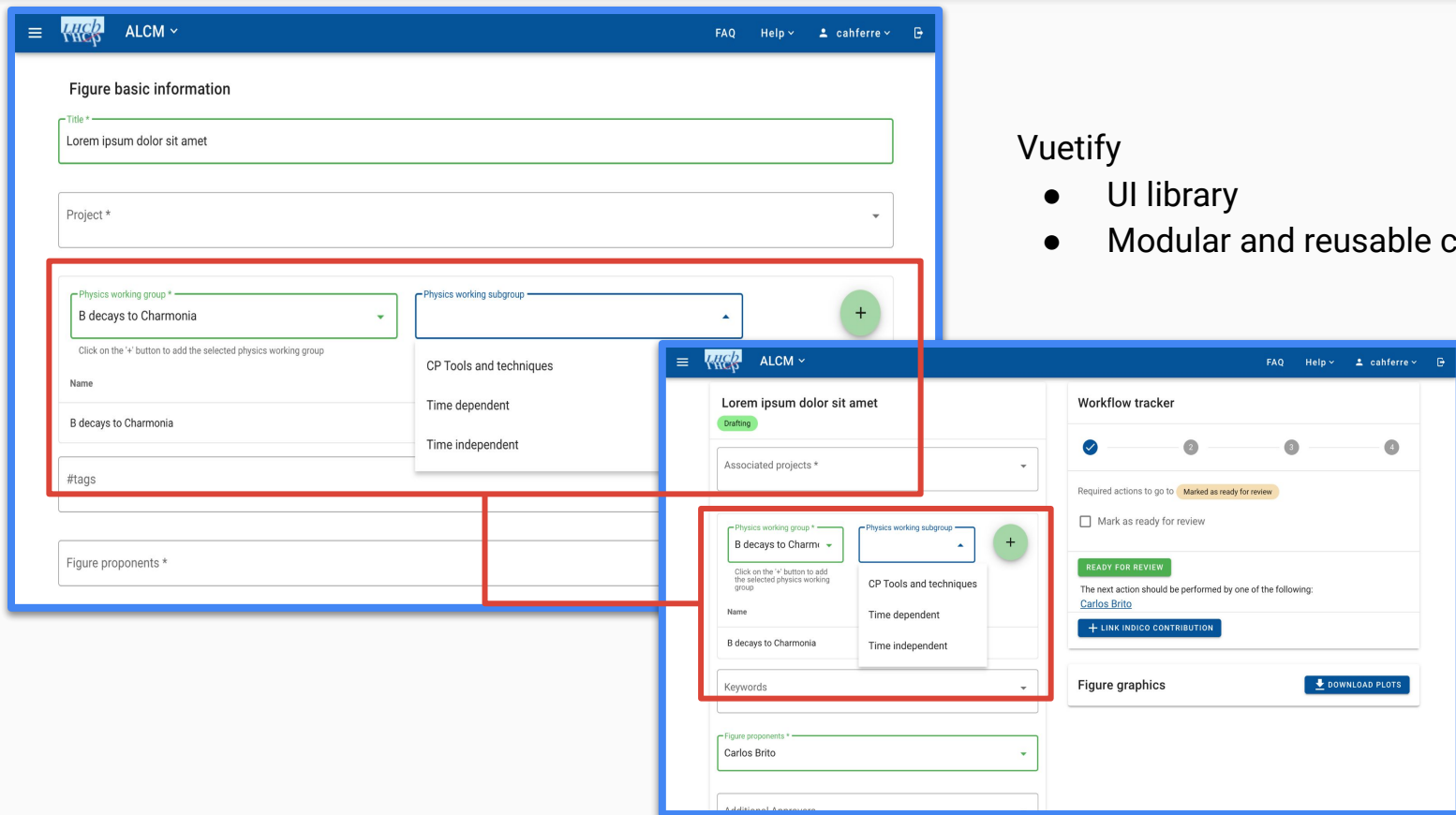
Qualities sought:

- Open-source
- Well documented
- Reusable components



Frontend technologies

- Vue.js
- Vue libraries
  - Vuetify
  - Vuex



## Vuetify

- UI library
- Modular and reusable components



```
const getters = {  
  member: state => state.member,  
  loadingMember: state => state.loadingMember,  
  ...  
};
```

```
const actions = {  
  async fetchMember({ commit }, memberId) {  
    commit('SET_LOADING_MEMBER', true);  
    const response = await memberApi.getMember(memberId);  
    commit('SET_MEMBER', response.data.member);  
    commit('SET_LOADING_MEMBER', false);  
    return response;  
  },  
  ...  
};
```

```
const mutations = {  
  SET_MEMBER(state, member) {  
    state.member = member;  
  },  
  SET_LOADING_MEMBER(state, loadingMember) {  
    state.loadingMember = loadingMember;  
  },  
  ...  
};
```

## Vuex

- State management library
- Reactive container that holds the application state



2020:

- Started developing the new architecture

2021:

- Launch of the first system in the new architecture: LHCb authorship

2023:

- Adopting the standard across the experiments
- Removing FENCE as a dependency from our applications

Future:

- Implement new systems with the new architecture
- Implement a more robust logging solution

# Thanks!

Glance project presentations at CHEP 2023:

- The ALICE Glance Membership system
  - Poster session, Poster #13, 15:30 - 16:30
- The ALICE Glance Service Work system
  - T8 May 8th, 2023, 15:00 - 15:15
- Iterative and incremental development of the ATLAS Publication Tracking system
  - T5 May 9th 2023, 14:00 - 14:15
- Enhancing data consistency in ATLAS and CERN databases through automated synchronization
  - T5 May 9th 2023, 14:15 - 14:30
- Glance Search Interface
  - T5 May 9th 2023, 14:30 - 14:45

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