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

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The Glance Project

- Active since 2003
- Used by 3 CERN experiments
- +20 web systems
The FENCE (Front-end ENgine for glaNCE) framework

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

Fence framework

```php
$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 - Issues

⚠ Issues

- Limited customization
FENCE - Issues

- Issues
  - Lack of documentation

FENCE statistics in 2018

- 25 (30-39) FENCE systems in production
- 65 core FENCE classes Total of 6,404
- 40,754 FENCE lines of code
- ~100 FENCE Jira closed tickets per month
- ~15k FENCE (ATLAS & ALICE) sessions per month
FENCE - Issues

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

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

```php
$dbmanager = new DBManager();

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

return $members;
```

```json
{
    "table": "ME_MEMBER_VIEW",
    "primary_key": "id",
    "model": "\\HCB\Membership\Models\Member",
    "components": {
        "firstName": {
            "column": "FIRST_NAME",
            "carrier": "setFirstName"
        },
        "lastName": {
            "column": "LAST_NAME",
            "carrier": "setLastName"
        },
        "orclid": {
            "column": "ORCID",
            "carrier": "setOrclid"
        }
    }
}
```
New architecture

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

Hexagonal architecture
- Loosely coupled concerns
- Flexibility
- Scalability
Backend

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

- Handling authorization with CERN's services
FRAPI endpoints

FENCE REST API (FRAPI)

- Building endpoints
  - Easy setup
  - Highly configurable

FRAPI setup

```php
use Fence\Frap\Api;

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

FRAPI configuration file

```json
{
  "auth": {
    "ss0": "keycloak"
  },
  "user": {
    "class": "LHCb\Membership\User"
  },
  "endpoints": {
    "folders": ["configuration/routes"
    ]
  }
}
```

FRAPI endpoint example

```json
{
  "type": "controller",
  "class": "\Member\Infrastructure\Web\MemberController",
  "paths": {
    "/members": {
      "GET": {
        "method": "findAllMembersBasicInformation"
      },
      "PATCH": {
        "method": "insertMembers",
        "schema": "resources/schemas/member-update.json"
      }
    }
  }
}
```
FENCE REST API (FRAPI)

- Logging HTTP requests
Frontend

Qualities sought:
- Open-source
- Well documented
- Reusable components

Single-page applications. Source: https://stackoverflow.blog/
Frontend technologies

- Vue.js
- Vue libraries
  - Vuetify
  - Vuex
Vuetify

- UI library
- Modular and reusable components
Vuex

- State management library
- Reactive container that holds the application state
Glance in the future

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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