

University of Pisa

Artificial Intelligence and Data Engineering

Distributed Systems and Middleware Technologies

FLconsole documentation

Authors: Çolak F. Messina F. Nocella F.

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Introduction and Project Overview

Context and Project Objective

In this section, the context and objective of the project are described.

Application Highlights

In this section, the highlights of the application are presented.

Analysis

Requirements

In this section, the requirements of the project are presented.

Functional Requirements

The functional requirements of the project are described in this subsection.

Non-Functional Requirements

The non-functional requirements of the project are described in this subsection.

Constraints/Other Requirements

Any constraints or other requirements on the project are described in this subsection.

Actors

The actors involved in the project are described in this section.

Use Case Modeling

In this section, the use case modeling of the project is presented.

Use Case Diagram

The use case diagram of the project is presented in this subsection.

Analysis Class Diagram

The analysis class diagram of the project is presented in this subsection.

Sequence Diagrams

The sequence diagrams of the project are presented in this subsection.

Design

Software Architecture

The software architecture of the project is described in this section.

Database Design

In this section, the database design of the project is presented.

MongoDB

Collections

ExpConfig document example:

```
{
  "id": "example_id",
  "name": "Example Experiment",
  "algorithm": "example_algorithm",
  "strategy": "example_strategy",
  "numClients": 10,
  "stopCondition": "example_condition",
  "threshold": 0.5,
  "parameters": {
    "param1": "value1",
    "param2": "value2",
    "param3": "value3"
  },
  "creationDate": "2024-03-14T00:00:00Z",
  "lastUpdate": "2024-03-14T12:00:00Z"
}
```

Experiment document example:

```
{
  "id": "example_id",
  "name": "Example Experiment",
  "expConfigSummary": {
    "id": "exp_config_id",
    "name": "Example Configuration",
    "algorithm": "example_algorithm"
  },
  "creationDate": "2024-03-14T00:00:00Z",
  "lastUpdate": "2024-03-14T12:00:00Z",
  "progressList": [
    {
      "creationDate": "2024-03-14T06:00:00Z",
      "parameters": {
        "param1": "value1",
        "param2": "value2"
      },
      "status": "In progress"
    },
    {
      "creationDate": "2024-03-14T09:00:00Z",
      "parameters": {
        "param1": "value1",
        "param2": "value2",
        "param3": "value3"
      },
      "status": "Completed"
    }
  ]
}
```

User document example:

```
{
  "id": "example_user_id",
  "email": "user@example.com",
  "password": "example_password",
  "creationDate": "2024-03-14T00:00:00Z",
  "configurations": ["config_id1", "config_id2"],
  "experiments": [
    {
      "id": "experiment_summary_id1",
      "name": "Experiment 1",
      "configName": "Configuration 1",
      "creationDate": "2024-03-14T06:00:00Z",
    },
    {
      "id": "experiment_summary_id2",
      "name": "Experiment 2",
      "configName": "Configuration 2",
      "creationDate": "2024-03-14T09:00:00Z",
      "lastUpdate": "2024-03-14T12:00:00Z"
    }
  ],
  "role": "example_role"
}
```

Erlang Message Handler

The Erlang message handler design is described in this subsection.

Message structure

- Error message

```
{
  "type": "error",
  "cause": "error_in_collecting_data",
  "timestamp": "2024-03-13T12:34:56"
}
```

- Stop message

```
{
  "type": "stop",
  "cause": "experiment_finished",
  "timestamp": "2024-03-13T12:34:56"
}
```

- Data message

```
{
  "type": "data",
  "parameters": {
    "param1": "value1",
    "param2": "value2"
  },
  "timestamp": "2024-03-13T12:34:56",
  "status": "running"
}
```


Implementation

Development Environment

The development environment used for the project is described in this section.

Main Modules

The main modules of the project are described in this section.

Configuration

The configuration of the project is described in this section.

Data Access

The data access layer of the project is described in this section.

Data Transfer

The data transfer mechanisms used in the project are described in this section.

Service

The services provided by the project are described in this section.

User Interface

The user interface of the project is described in this section.

Adopted Patterns and Techniques

The patterns and techniques adopted in the project are described in this section.

Testing

Structural Testing

The structural testing performed on the project is described in this section.

JUnit Testing

The JUnit testing performed on the project is described in this section.

Functional Testing

The functional testing performed on the project is described in this section.

Test Cases

The test cases used for the project are presented in this section.

Conclusion

In this chapter, we summarize the key points of the document and discuss possible future directions for the project.