

# FairDB: The FairRoot Virtual Database

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## Introduction

Since the setup of a typical heavy ion experiment at FAIR [1] is varying depending on the physic case to study, the FairRoot framework for simulation and analysis [2] should be able to handle a large amount of different parameters and their variation in time. Currently the FairRoot framework uses the Hades Runtime Database Library [3] as third-party code to initialize parameter from ascii or ROOT [4] input files. This report describes the new FairDB Virtual Database Library which extends the FairRoot framework initialization scheme to any SQL-Databases systems.

## Database Interface

FairDB provides the user with a well-defined and uniform API for database manipulation. Using internally the ROOT TSQLServer class [4], the same user code can be executed independently on Oracle, MySQL, PostgreSQL and even SQLite SQL database engines (Fig. [1]).

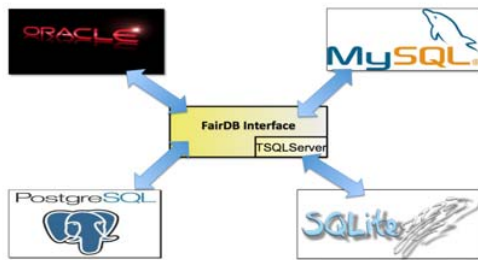


Figure 1: FairDB supported SQL-Database engines.

## Design

FairDB separates the connectivity to the DBMS into a *front-end* and a *back-end* (Fig [2]). The *front-end* delivers the relational data model and implementation (tables, query algorithm, versioning etc ...) together with the database connectivity layer. The *back-end* defines the communication layer to specific DBMS using the appropriate client library. Recently the PostgreSQL lower level driver TPgSQLServer.cxx has been corrected and partially rewritten. The patch has been accepted and is part of the ROOT release 5-34-15.

## Initialization

The SQL-Database input can be added to the FairRoot initialization scheme (Fig [3]) using the services of the gen-

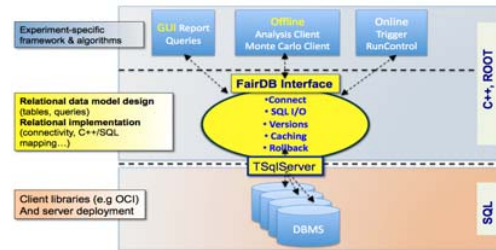


Figure 2: FairDB Design

eral parameter input FairRunTimeDB. For accessing the data more than one database connection can be used according to a given user-defined URLs list.

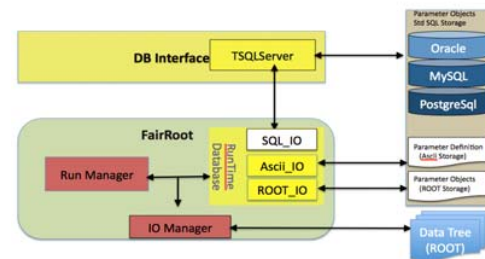


Figure 3: FairRoot initialization scheme including SQL Database input.

## User Manual

In order to smooth the learning curve for the FairDB usage, a complete User Manual in PDF format has been written. It covers the general concept, database installation and all the FairDB interface features with tutorials [5].

## References

- [1] <http://www.gsi.de/fair/>
- [2] The FAIR simulation and analysis framework 2008 J. Phys.: Conf. Ser. 119 032011
- [3] <http://web-docs.gsi.de/ilse/initialization.htm>
- [4] R. Brun, F. Rademakers, P. Canal, I. Antcheva, D. Buskulic, O. Couet, A. and M. Gheata *ROOT User Guide* CERN, Geneva 2005.
- [5] FairRoot Virtual Database (User Manual). <https://panda-wiki.gsi.de/foswiki/pub/Computing/PandaRoot/FairRootVirtualDatabase.pdf>