

Environmental Database

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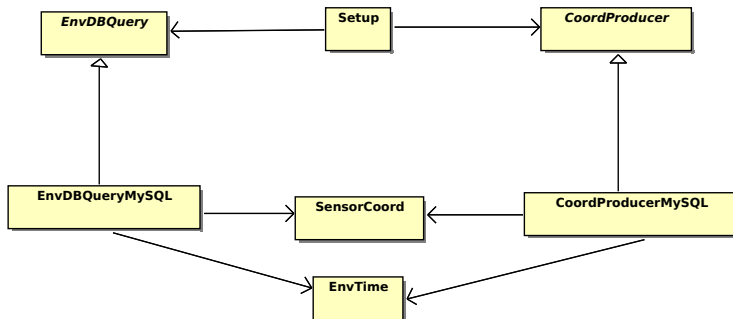
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- Slow control monitors environmental values and stores them in a database
 - Temperatures
 - Humidity
 - Voltages, currents of power supply
 - Status of power supplies, VME crates etc.
- EMC prototype Proto192 is also a prototype for PANDA Slow Control
- Beam tests with Proto192 at CERN and ELSA
- How to get data from environmental database?
- There was no solution available \Rightarrow Made a first implementation for PANDA

- User should not have to know about databases
⇒ User interface of library should not depend on database implementation
- Values depend on time and position
⇒ Abstract time and coordinate objects
- Make it easy to replace database engine
⇒ Currently using MySQL, will be replaced by PostgreSQL in near future
What will be used for PANDA in 2017?



Abstraction of Database Engine:

- Abstract base class *EnvDBQuery* with singleton design pattern
- Implementation of database access in derived class
- If database engine is replaced: Only need to add derived class for new engine
⇒ No changes in user programs or other classes!

Setup:

- Unrestricted usability
- Site-specific settings (engine, host, user, password, port)
- *Setup* parses configuration file and creates corresponding instance of class derived from *EnvDBQuery*

```
Setup *config = new Setup( " preferences.ini" );

SensorCoord mySensorByPosition( "1-x3y3-d",
                                SensorCoord::front ,
                                SensorCoord::bottom );

SensorCoord mySensorBySerial( 29 );

EnvTime myTimeByDate( 2011, 10, 28, 12, 0, 0, 0 );

EnvTime myTimeByEpoch( 1320321600. );

EnvDBQuery *myQuery = EnvDBQuery::getInstance();

dbResult value = myQuery->getValue( mySensorByPosition ,
                                    myTimeByDate );

std::vector<dbResult> values =
    myQuery->getValueRange( mySensorBySerial ,
                           myTimeByDate ,
                           myTimeByEpoch );
```

- Needed API to get data from environmental database
- Implemented abstract objects for time, (sensor-)coordinates
- Abstraction of database engine
- Implement a solution for PANDA
 - Which values/coordinate types are needed by other detectors?