Implementing a Modular Framework in a Conditions Database Explorer for ATLAS

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DB Data from ATLAS online and offline

• Offline ATHENA → DB objects defined from transient C++
• The LCG/COOL interface is used to store simple types or POOL oid's
• LCG/POOL object introspection ⇆ object browser.
• POOL/CASTOR batch operations **not** for browser.
Online:
• DB Objects from **Configuration Database** (OKS)
• DB Objects from online **Information System** (ONASIC2)
• DB Objects from **Monitoring:** stored as root histograms in Castor.
• **Detector Calibrations** accessed also outside ATHENA framework.

Object store - mixed technologies

• Examples of Complex object stores:
  • Defined as ATHENA classes – stored in LCG/POOL - conversion services – OID's stored in COOL ORACLE with "file/path" names.
  • Online monitoring histograms – shared as online objects – saved as root histograms in huge Castor files.

Interactive Browsing ?

Object Schema Problem and TIDB2
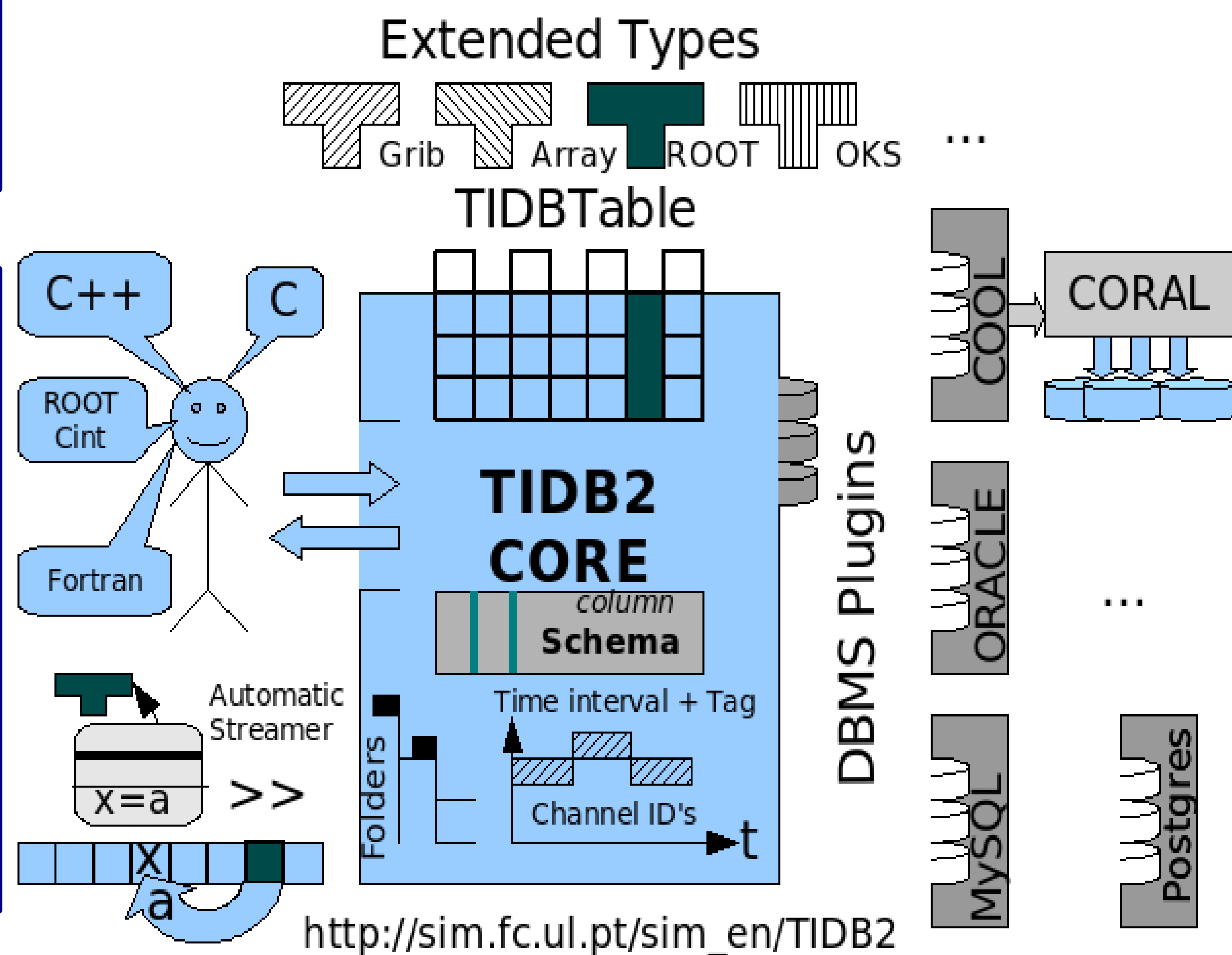
The **Temporal Instrumental Database (TIDB2)**

• includes COOL (CORAL) features:
  • Abstract interfaces to different RDBMS
  • DB tables as hierarchical folders
  • Replacing SQL by a transient table for storing and retrieving
  • Managing of validity intervals, versions and tags
• **Extra features:**
  • Knows about extended object types in DB entries.
  • Automatically associates simple table columns to object parameters
  • Manages the schema evolution of extended objects
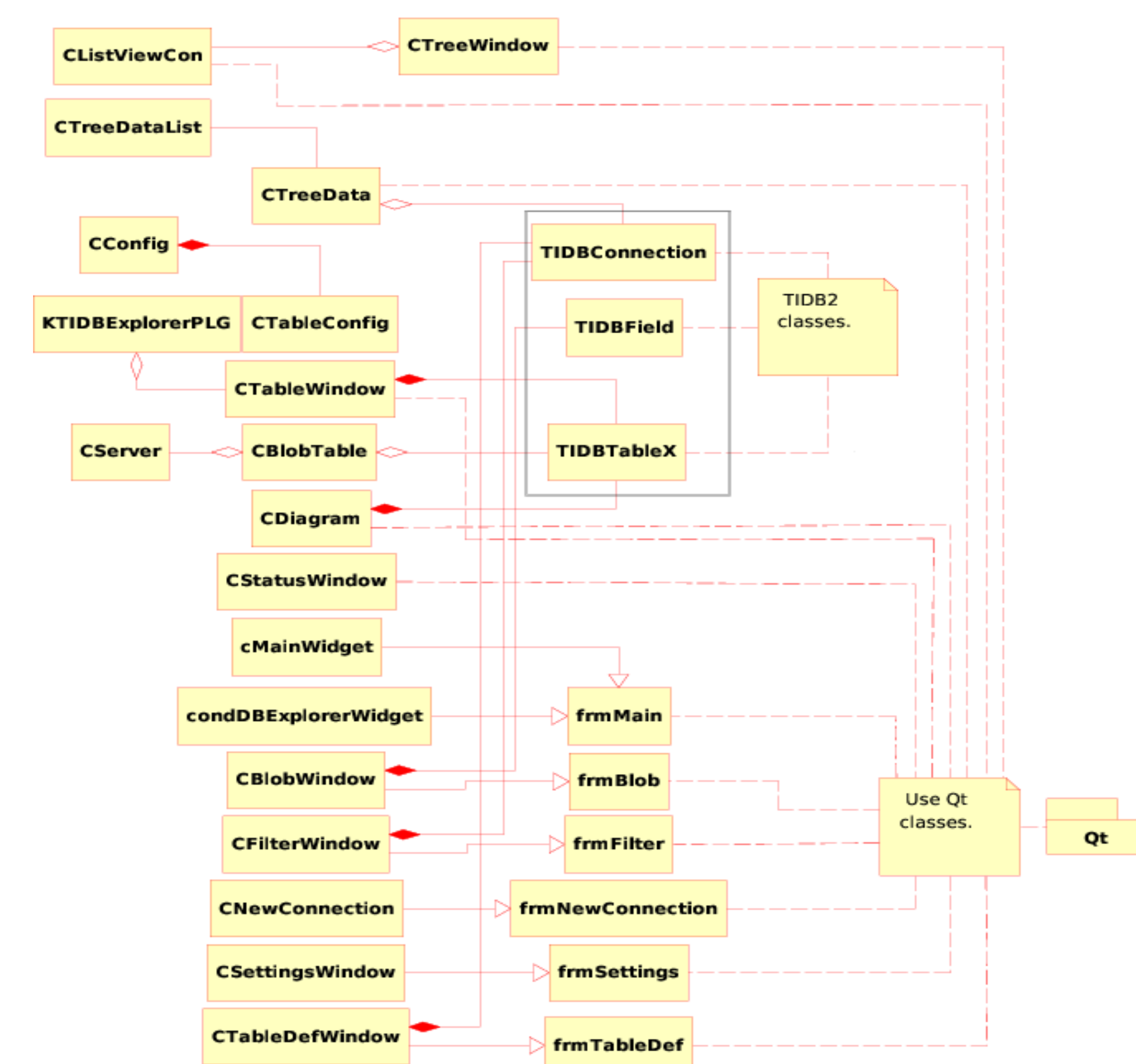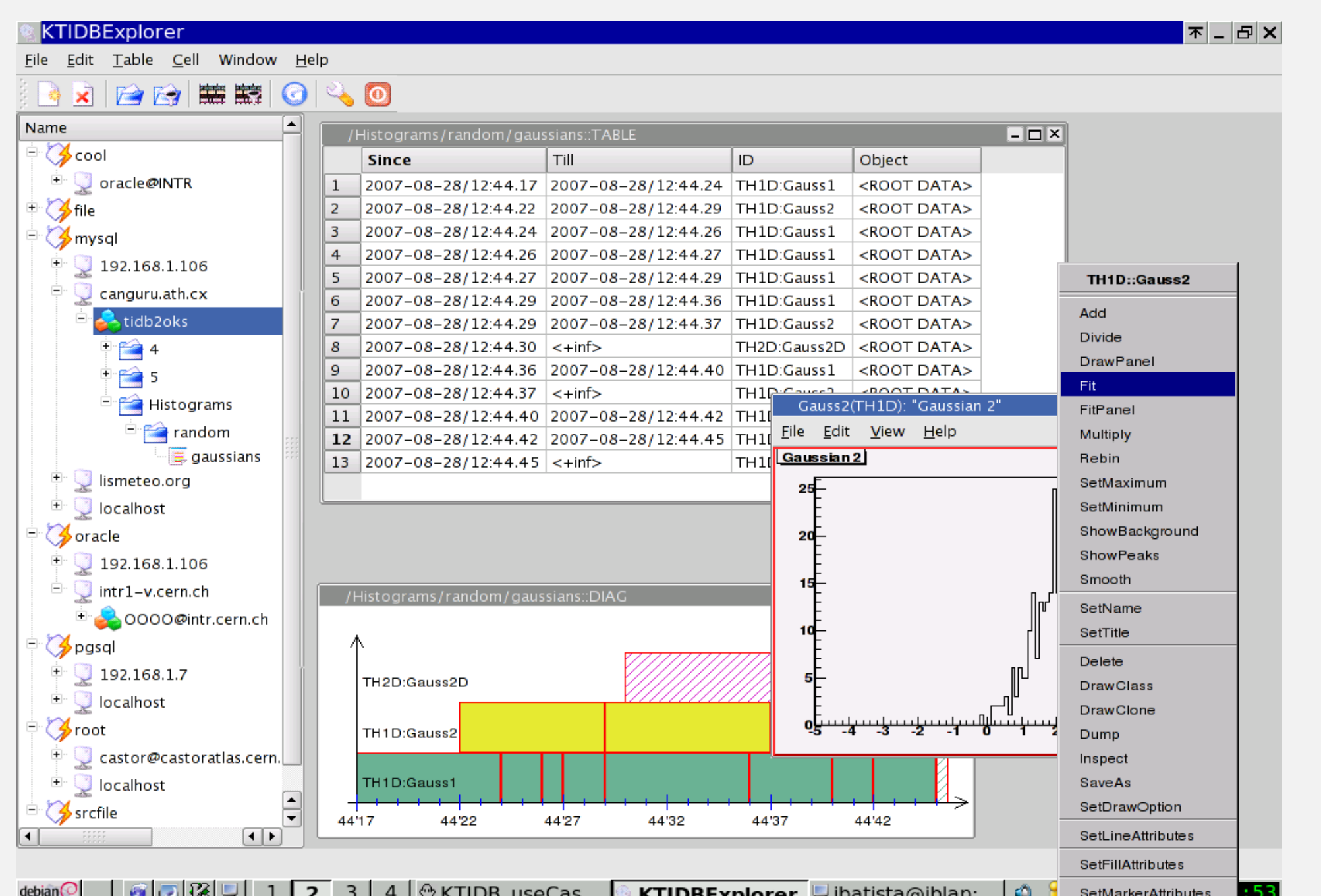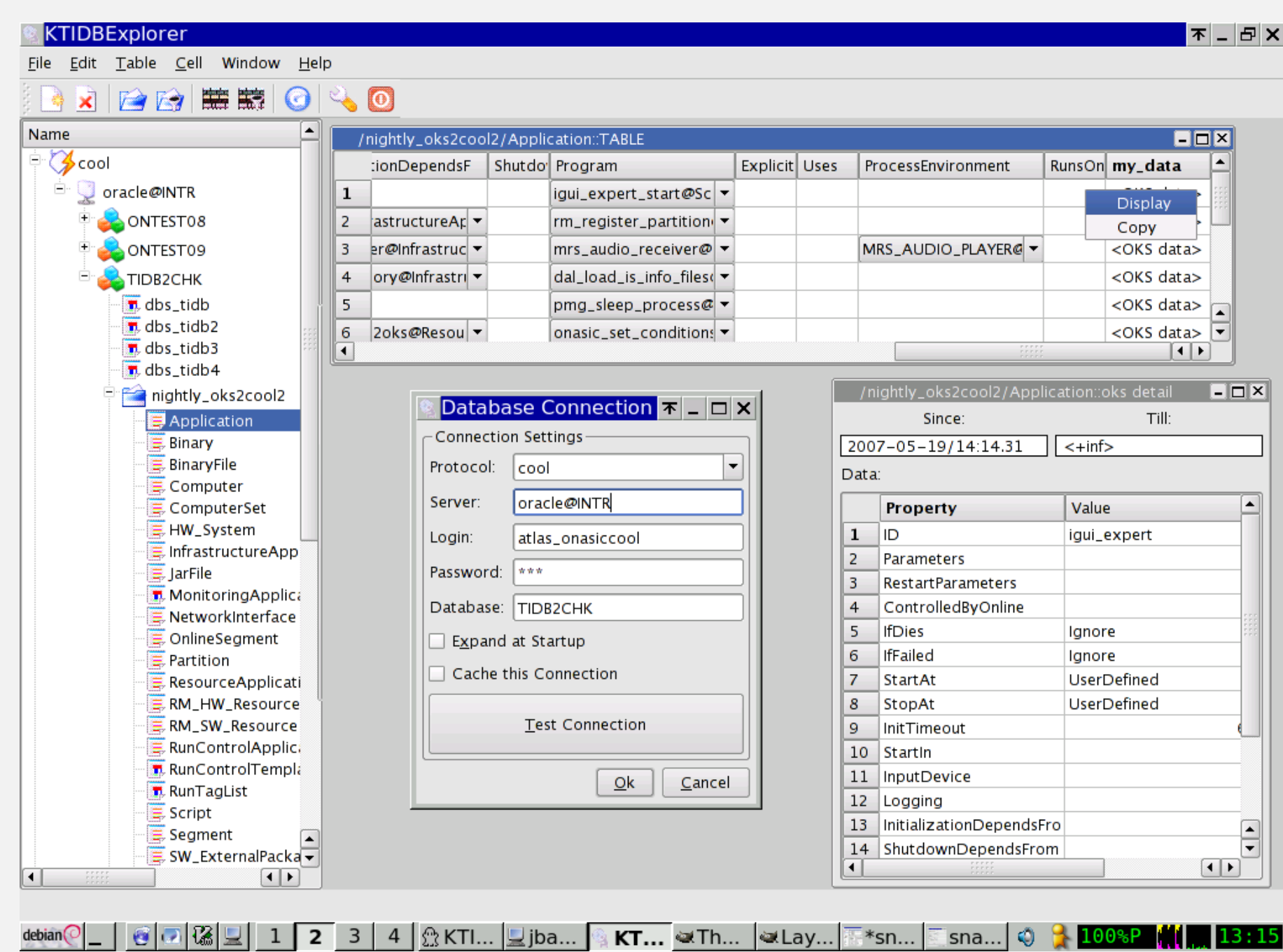COOL plugin; Stream API; Root Cint binding with table <-> TTree

Extended Types

Grib   Array   ROOT   OKS   ...

TIDBTable

C++   C
ROOT Cint
Fortran

TIDB2 CORE
column
Schema

Automatic Streamer
x=a >>
Folders |x| a

Time interval + Tag
Channel ID's
t

DBMS Plugins
COOL → CORAL
ORACLE   ...
MySQL   Postgres

http://sim.fc.ul.pt/sim_en/TIDB2

Ktidbexplorer

Ktidbexplorer
TIDB2 → COOL   QT
Display of Root Object
TIDB2 Root plugin

CListViewCon — CTreeWindow
CTreeDataList
CTreeData
CConfig
KTIDBExplorerPLG CTableConfig   TIDBConnection   TIDB2 classes.
CServer   CTableWindow   TIDBField
   CBlobTable   TIDBTableX
CDiagram
CStatusWindow
cMainWidget
condDBExplorerWidget → frmMain
CBlobWindow → frmBlob
CFilterWindow → frmFilter   Use Qt classes.   Qt
CNewConnection → frmNewConnection
CSettingsWindow → frmSettings
CTableDefWindow → frmTableDef

Extending: Monitoring Data Archive browser

The **ONline Objects Extended Database BrowsEr (NODE)** the visualization tool for the MDA.

Extending **KTIDBExplorer**, for NODE's Graphical User Interface. The visualization plugin for ROOT histograms was developed. The interface with MDA is achieved through a set of TIDB plugins, now in development stage.

A Design study is under way to evaluate the software engineering choices for implementing a Comments facility in NODE, to allow human (time-based) tagging of histograms.
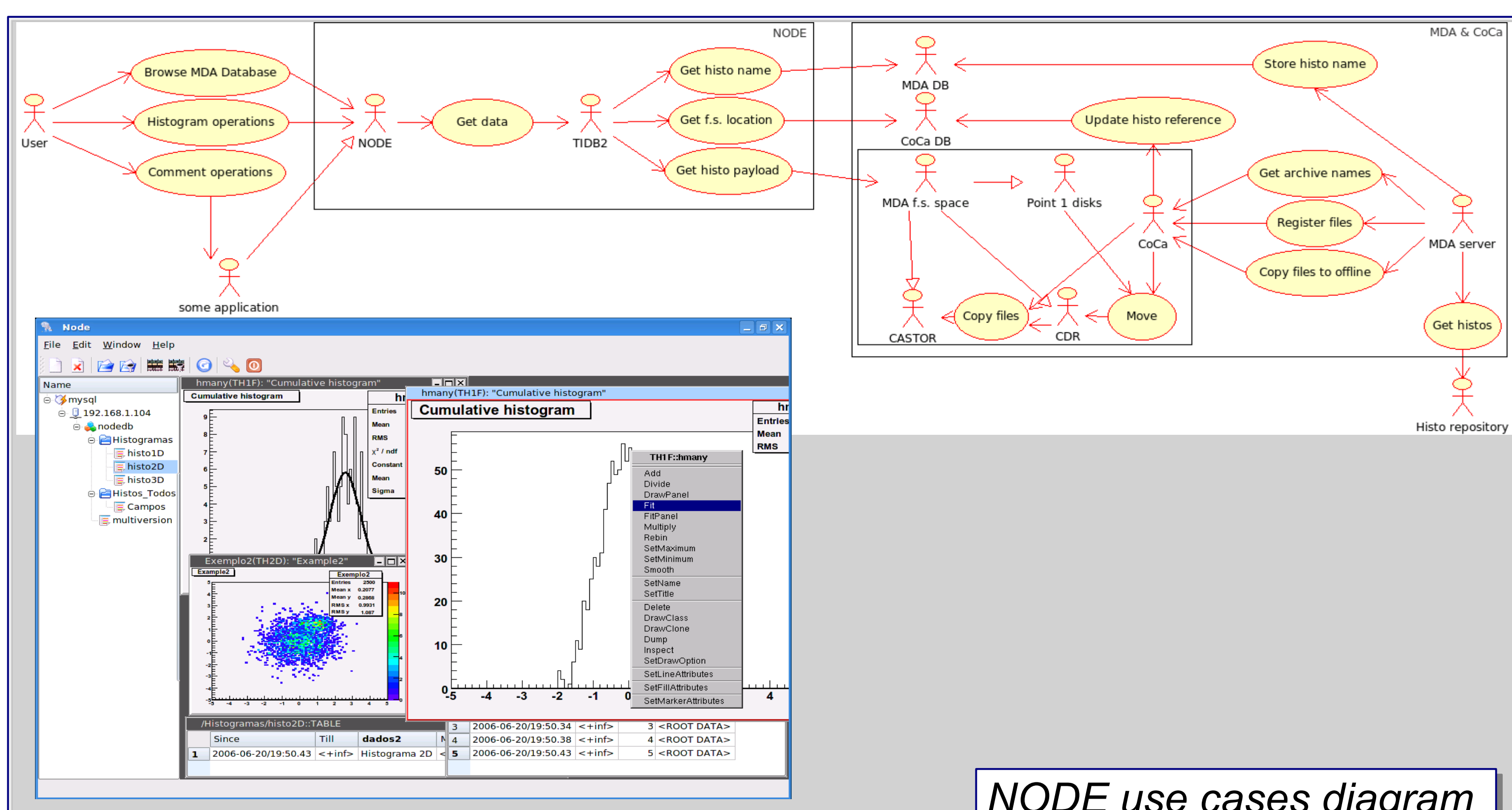
NODE use cases diagram and GUI snapshot