

The GEO Online Detector Characterization System

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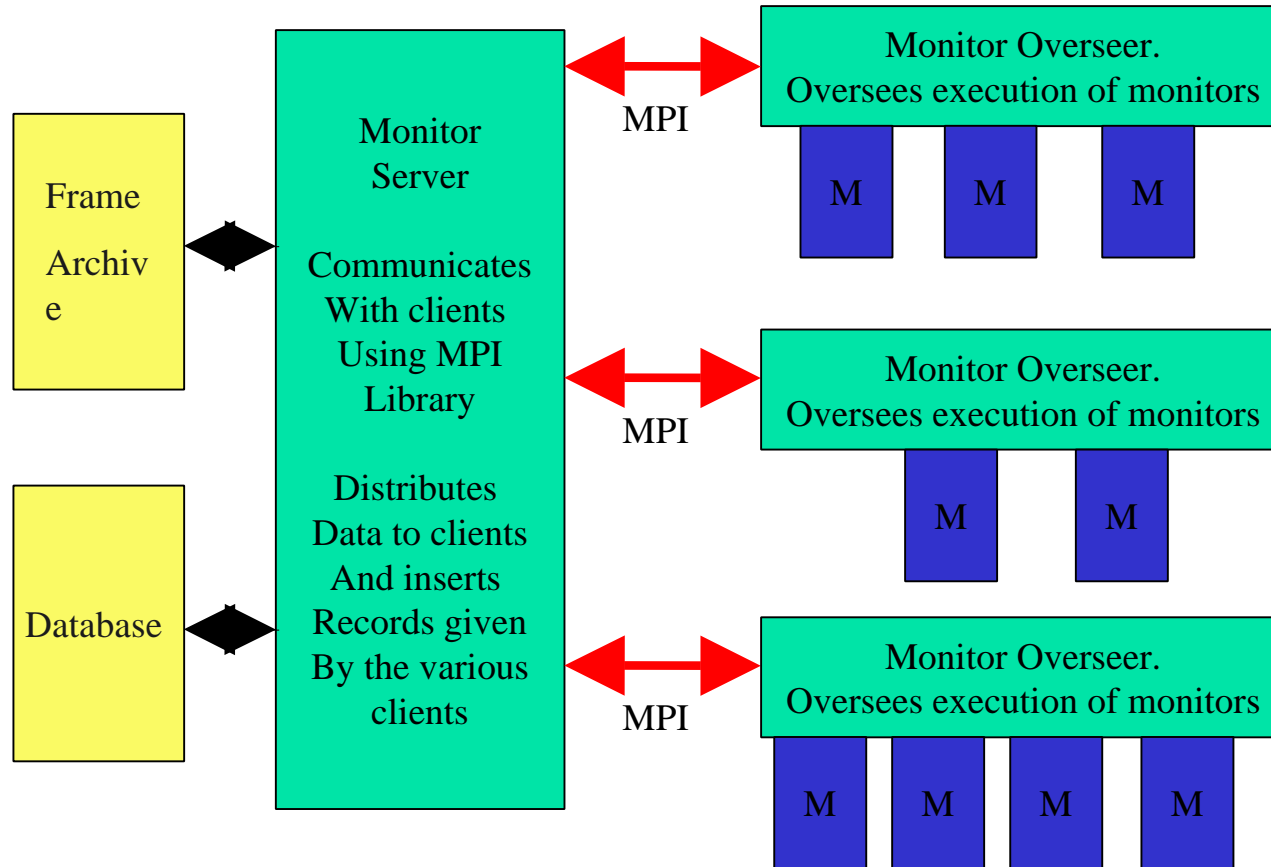
GODCS

- The basic purpose of the online detector characterization system is to monitor and characterize the various channels produced by the interferometer.
- The software is written in C++ and includes a signal processing library
- The software includes Frame Data I/O and database I/O
- The system is designed to be highly extensible. All analysis is carried out by *monitors* and users can determine which monitors they wish to execute.
- The system produces results primarily in the form of database records.
- Monitors can be distributed over a Beowulf Cluster.

People Involved

- Main Development Group
 - Stas Babak
 - R.Balasubramanian
 - David Churches
- Validation and monitors
 - Karsten Koetter
 - Uta Weiland
 - Martin Hewitson
 - Siong Heng
 - Thomas Cokelaer

GODCS Architecture



GODCS Monitors

Event Monitors

- LockStatusMon
- SaturationMon
- PowerTrackerMon
- GlitchInPowerLineMon
- HACRMon
- InspiralSenseMon
- LineDetectMon
- PQMon
- InspiralSearchMon
- GlitchMon
- PowerLineMon
- BicoherenceMon
- CrossCorrelationMon

Subsidiary monitors

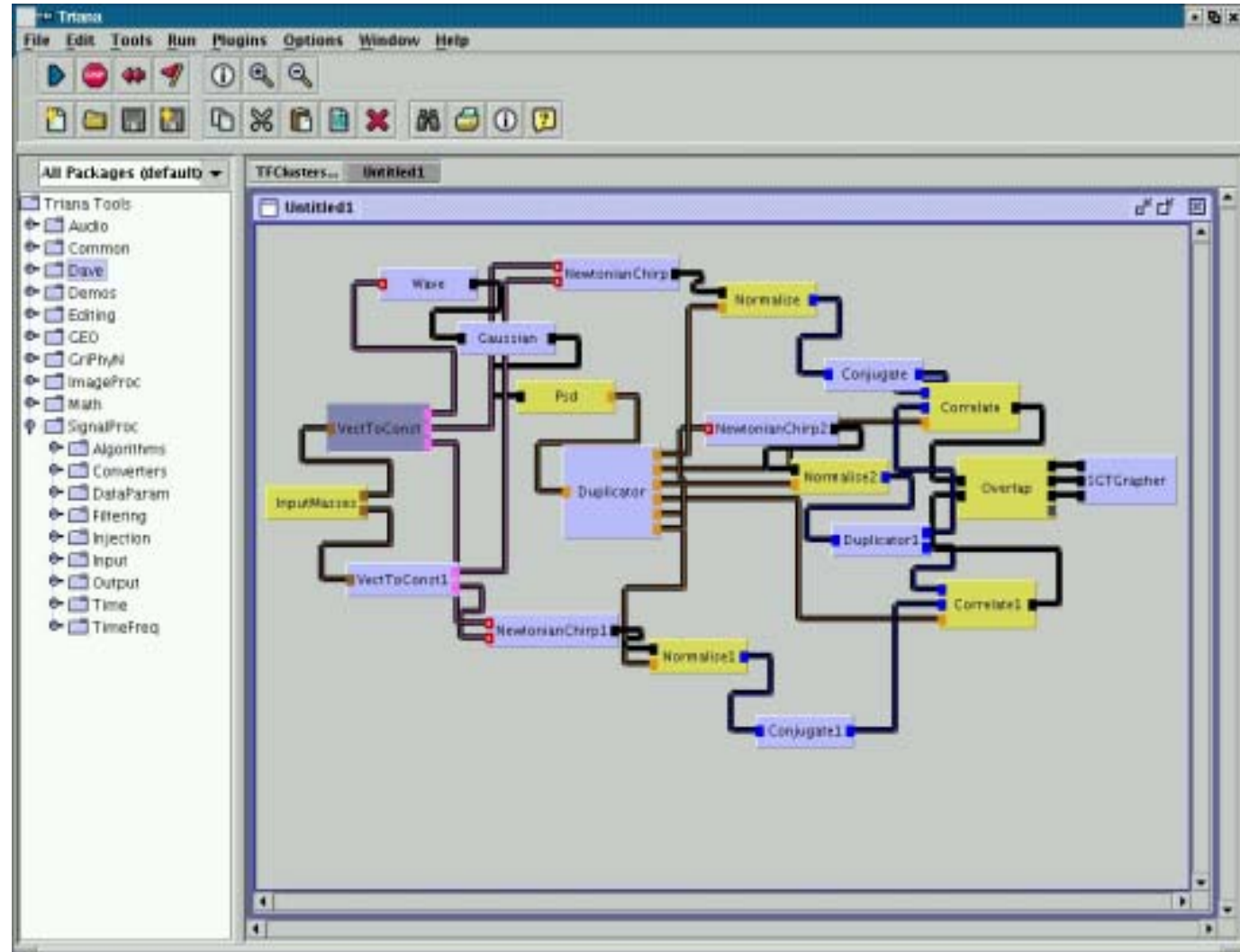
- FrameChannelSummaryMon
- DataDumperMon
- NoiseGeneratorMon
- NoiseGeneratorFreqMon
- IIRBandFilterMon
- IIRFilterMon
- FIRBandFilterMon
- FFTBandFilterMon
- PsdMon
- PsdRunMon
- SpectrogramMon
- TSpecDisplayMon
- LIGOCalibrationMon
- InspiralPreprocessMon
- DelayMon

TRIANA

- Triana is an open source platform independent Problem Solving Environment (PSE)
- It is a graphical environment which allows the user to compose applications and specify their distributed behaviour
- One builds an application by dragging and dropping algorithmic *units* from a toolbox into the workspace
- Triana is built upon a communication API called the GridLab GAT which will provide a consistent API to Grid services
- Triana implements SPMD parallelization – a *group* of units is duplicated onto available processing nodes and the data is split over the nodes

The TRIANA GUI

- Grey boxes are *units*
- Yellow boxes are *groups* of units
- The pipes carry data from one unit/group to the next



VISUALIZING THE GODCS DATABASES

- GODCS produces output in the form of database records (mySQL)
- Triana has database reading and graphical display capability
- We have constructed Triana groups which execute specific database queries which provide different *views* of the database
- These queries can be run retrospectively over old database records or run online as the data comes in
- For each of the GODCS database tables we will have a Triana group (s) which will keep track of the progress of the monitor

DATABASE MONITORING

- Database details (hostname, username, password, database) stored by DBDetails Unit
- Scheduling of database queries controlled by Timer Unit
- Specific database query formed by MonitorViewer Units
- All subsequent analysis and graphical presentation performed by 'standard' Triana units
- Applications can be saved, re-opened and restarted from the same state
- Applications are easily extensible and new MonotorViewers easily added

PLANS

- The GODCS monitors will run on the Hannover beowulf and the results written into a database there
- Triana will be installed at the site so experimenters can have an online view of these databases – delay determined by the time it takes to write the frames
- We will engage in communication with the experimenters to maximise the effectiveness of the tools for them