

DØ Online Use Of & Plans For ROOT

- **Examine Framework**

- Online Monitor of Experiment - Histogram Comparison to References.
- Two Separate but Co-ordinated Pieces: Executable & GUI.
 - * Executable - Reconstructs events, calculates physical quantities, fills histograms.
 - * GUI interacts with Executable allowing user control and histogram display.
- Examine Executables - Calorimeter, Muon, Tracker, Beam, Global, & Trigger.
- Need system for physics analysis, histogram generation & display, and system for Executable-GUI communication.
- Want flexibility and ability to generalize Framework to offline analysis.
- Must run on various platforms and operating systems.
- ROOT based applications provide the Needs, Wants, and Musts.

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- **Examine Control Panel Application (ECP)**

- C++ GUI Using ROOT Classes
- Easy User Display & Manipulation of Histograms to monitor performance of the detector and the data collection process.
- Control Examine Process

- **Client - Server Model**

- Server - ROOT or Application using ROOT Classes
 - * Makes histograms available
- Client - Examine Control Panel
 - * Select & Control Examine Process
 - * Select & Request Histograms from Server

- **Present Implementation**

- Server - ROOT running Macro
 - * Communication - TServerSocket, TSocket, TMessage Classes
 - Listens on Specified Port for Requests & Commands
 - Sends Histograms & Info
 - * Histograms - TFile Class
 - On Disk - Location pointed to by Environment variable. If not set, prompts user for location. (Could be in Memory or Remote.)
- Client - ECP
 - * Communication - TSocket, TMessage, TTimer Classes
 - Sends Requests & Commands
 - Receives Histograms & Info
 - Synchronous
 - * GUI - TG* Widget Classes
 - Buttons, Listboxes, Menus, Dialogs, Text Areas

- **Present Functionality**

- Buttons

- * **START/STOP** - Toggle. **START** opens communication channel with Server. Retrieves lists of TFiles and their histograms. The TFile names are displayed in the Category listbox. When a category is clicked and highlighted the histograms in the corresponding TFile are shown in the Histogram listbox. **STOP** closes communication channel with Server. Ends Cycling if active.
 - * **PAUSE/RESUME** - Toggle. Send Pause or Resume command to Examine Process. Pause or Resume Cycling if active.
 - * **HDISPLAY** - Display highlighted histograms in one or more windows. Number and arrangement of histograms in window is user configurable via Preferences setting.
 - * **CYCLE** - Toggle. Cycles through the display of all entries in histogram listbox. Block of histograms displayed is highlighted in listbox. Number and arrangement of histograms in window, and delay between cycles is user configurable via Preferences setting.

- Menu Items

- * **CLOSE** - Closes all visible histogram windows.
 - * **EXIT** - Stop communications channel with server if active. Stops Cycling if active. Exits ECP.
 - * **PREFERENCES** - Initiates dialog to set user preferences: Histogram Grid, Cycle Delay, Server Address, Server Port. ECP supports reading of preferences from a file at start up. First looks for file pointed to by environment variable, if not defined looks for default pref. file, if not found use default values.
 - * **ABOUT** - Shameless plug.

- **Future Functionality**

- Interact with the Histogram Interface of the Complete Examine Framework.
- Buttons
 - * ABORT - Abort Examine Operation
 - * COMPARE - Compare Histograms
 - * DISPLAY - Event Display
 - * DUMP - Dump Event
 - * PRINT - Print Highlighted Histograms
 - * RESET - Clear Highlighted Histograms
 - * SAVE - Save Histograms To File
 - * STATUS - Examine Status Report
 - * STEP - Step Through Histogram List One at a Time
 - * UPDATE - Update Highlighted Histograms
- Menu Items
 - * EDIT - Manipulate Message Area
 - * EXAMINE - Select an Examine Process
 - * FILE - Select Input Mode and Other Utilities
 - * HELP - Give the Poor User Some Clues

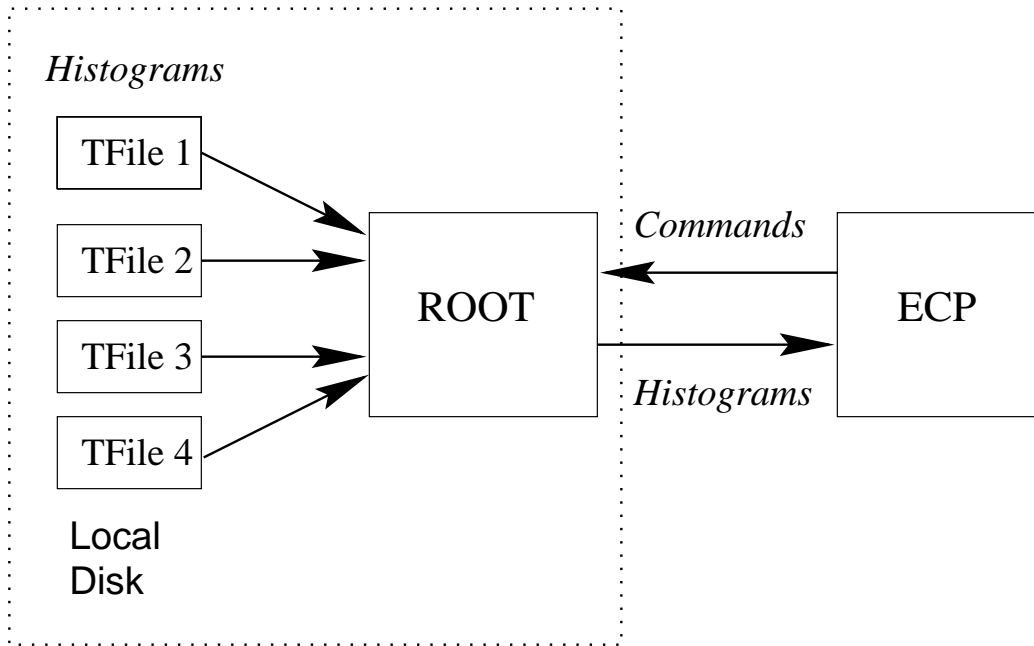
- **Future Plans**

- ECP → General Analysis Browser
 - * Open ROOT file on disk within GUI using File Menu options, and Display and Manipulate them.
 - * Setup, Control, & Report Status of Analysis Job.

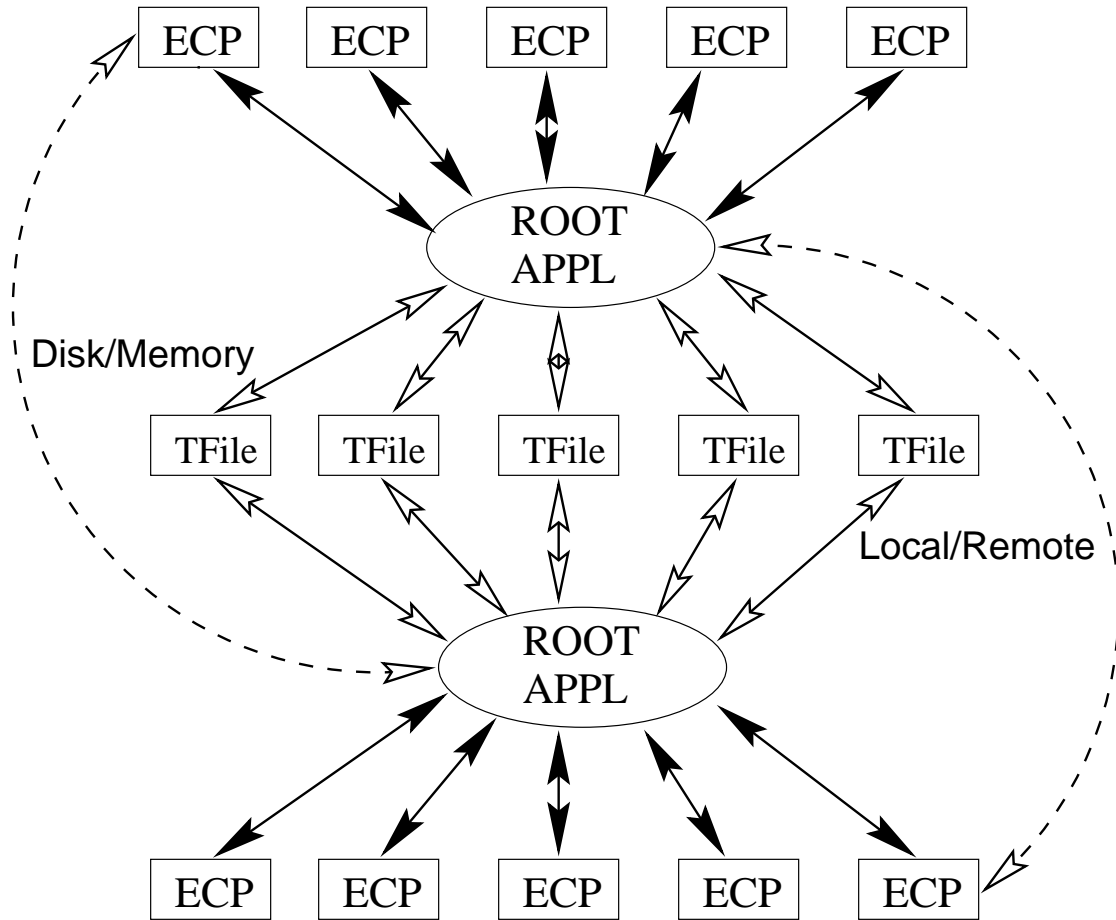
- **Caveats, Joys, & Wishes**

- ECP is Embryonic. Incarnation is sure to transmogrify.
- ROOT Classes provide the scope and flexibility necessary to accomplish the task at hand.
- Integration of CORBA and ROOT communication packages.
- JAVA/ROOT Interface.
- Like to see from ROOT more docs, examples, widgets, and thread control.

Present Configuration



Possible Future Configuration



Examine Control Panel

File Edit Examine

Help

Processing

Start

Pause

Abort

Status

Dump

Display

Category: ele50-1000evt

Available Histograms

ele50-1000evt

mu50-1000evt

pi50-1000evt

ttb-100evt

Cell Energy, layer1

Cell Energy, layer2

Cell Energy, layer3

Cell Energy, layer4

Cell Energy, layer5

Cell Energy, layer6

Cell Energy, layer7

Cell Energy, layer8

Cell Energy, layer9

Histograms

Display

Step

Compare

Update

Reset

Cycle

Print

Save

Messages

Examine Control Panel V1.00