LHCb Offline Application Framework

Status
20 October 1998
P. Mato, CERN
Project Goals (reminder)

- Development of an O-O framework for the LHCb data processing applications (simulation, reconstruction, analysis). Completed by 2000.
- Periodic releases with added functionality.
- Release 1.0 at the end of this year. The functionality:
  - Definition of input/output data. Job parameters.
  - Loop over events. For each event, access MC data truth from ZEBRA files produced by SICB.
  - Provide placeholders for analysis user code.
  - Output results in form of histograms and/or ntuples.
Progress from last week

- Main activity: Architecture design.
- Visit to LAL (Orsay)
- Some changes on the overall architecture since last week.
- Studied in more detail:
  - Detector description
  - Visualization aspects
- Compiling the list of scenarios.
Visit to LAL (Orsay)

- Confront our current architecture ideas to experts.
  - Positive reassurance.
  - Suggestions of presentation (scenario diagrams, semantic of lines in graph, ...)
  - Other suggestions: time-evolution relationship (from new to old).

- Detector description
  - Transient model to many specific models (see later)
  - Importance of “Identifiers”. There is the need to have references to detector elements from event store or detector description.

- Visualization
  - Graphical converters and “selectors” (see later)
This week Architecture
Architecture (class diagrams)

Services

- PersistencySvc
- JobOptionSvc
- EvtDataSvc
- EventPersSvc
- DetPersSvc
- MessageSvc

<<interface>> IService
<<interface>> IPersistencySvc
<<interface>> IQueryOptions
<<interface>> IEvtDataSvc
<<interface>> IMessageSvc
Architecture (use cases)

- AppManager
- Algorithm A
- Algorithm B
- AlgorithmFactory
- EventDataSvc

1: CreateAlgorithm()
2: New
3: Initialize()
4: CreateAlgorithm()
5: New
6: Initialize()
7: NextEvent()
8: DoEvent()
9: DoEvent()
10: Find(char*)
11: Process
12: Register()
Detector Description

- ATLAS approach:

  - ASCII descriptions
  - Transient Model
  - Persistent Model
  - Interface to C++ applications (recons/simul)
  - FORTRAN commons
  - Transformation use visitors

20/10/98
Detector Description (2)

- Detector Elements need to be “identified”
- Strong hierarchical structure
- Versioning

Diagram:
- Detector Data Service
  - Transient Detector Store
  - Persistency Service
  - ToGeant4 Service
  - Geant4 Detector description
  - Persistency Detector Store
  - Converter
Visualization

- Transient Event/Detector Store
- Rep. Service
- Converter
- Selector
- Representations Store (graphical, textual)
- Graph Store
- User Interface

Mark objects in Store
## Work Breakdown

<table>
<thead>
<tr>
<th>Domain</th>
<th>Components</th>
<th>Who</th>
<th>Deliverables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data processing</td>
<td>Application Manager</td>
<td>PM</td>
<td>description, diagrams</td>
</tr>
<tr>
<td></td>
<td>Algorithm Interface</td>
<td>PMy</td>
<td>description, diagrams</td>
</tr>
<tr>
<td></td>
<td>Job Options Service</td>
<td>MC</td>
<td>description, diagrams</td>
</tr>
<tr>
<td></td>
<td>Event Selector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event data model</td>
<td>Event Data Service</td>
<td>MF</td>
<td>description, diagrams</td>
</tr>
<tr>
<td></td>
<td>Transient Event Store</td>
<td>MF, PMy</td>
<td>description, diagrams</td>
</tr>
<tr>
<td></td>
<td>Event Persistency Service</td>
<td>MF</td>
<td>description, diagrams</td>
</tr>
<tr>
<td></td>
<td>Transient Event Model</td>
<td>PB</td>
<td>Raw Event - diagram, model</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Monte Carlo Event - diagram, model</td>
</tr>
<tr>
<td>Detector data model</td>
<td>Detector Data Service</td>
<td>MF</td>
<td>description, diagrams</td>
</tr>
<tr>
<td></td>
<td>Transient Detector Store</td>
<td>MF</td>
<td>description, diagrams</td>
</tr>
<tr>
<td></td>
<td>Detector Persistency Service</td>
<td>MF</td>
<td>description, diagrams</td>
</tr>
<tr>
<td></td>
<td>Detector Data Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Histogram model</td>
<td>Histogram Service</td>
<td>IL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transient Histogram Model</td>
<td>IL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Histogram Persistency Service</td>
<td>MF</td>
<td></td>
</tr>
<tr>
<td>Visualization</td>
<td>Visualization components</td>
<td>JH, IL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graphical Representation Service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Interface</td>
<td>Interactive User Interface</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Message Service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Networking</td>
<td>Distributed Object Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>System kernel</td>
<td>IL</td>
<td></td>
</tr>
</tbody>
</table>
1 week delay for the moment.

Hopefully this translates into better design.