LHCb Detector Description

DDDB Meeting

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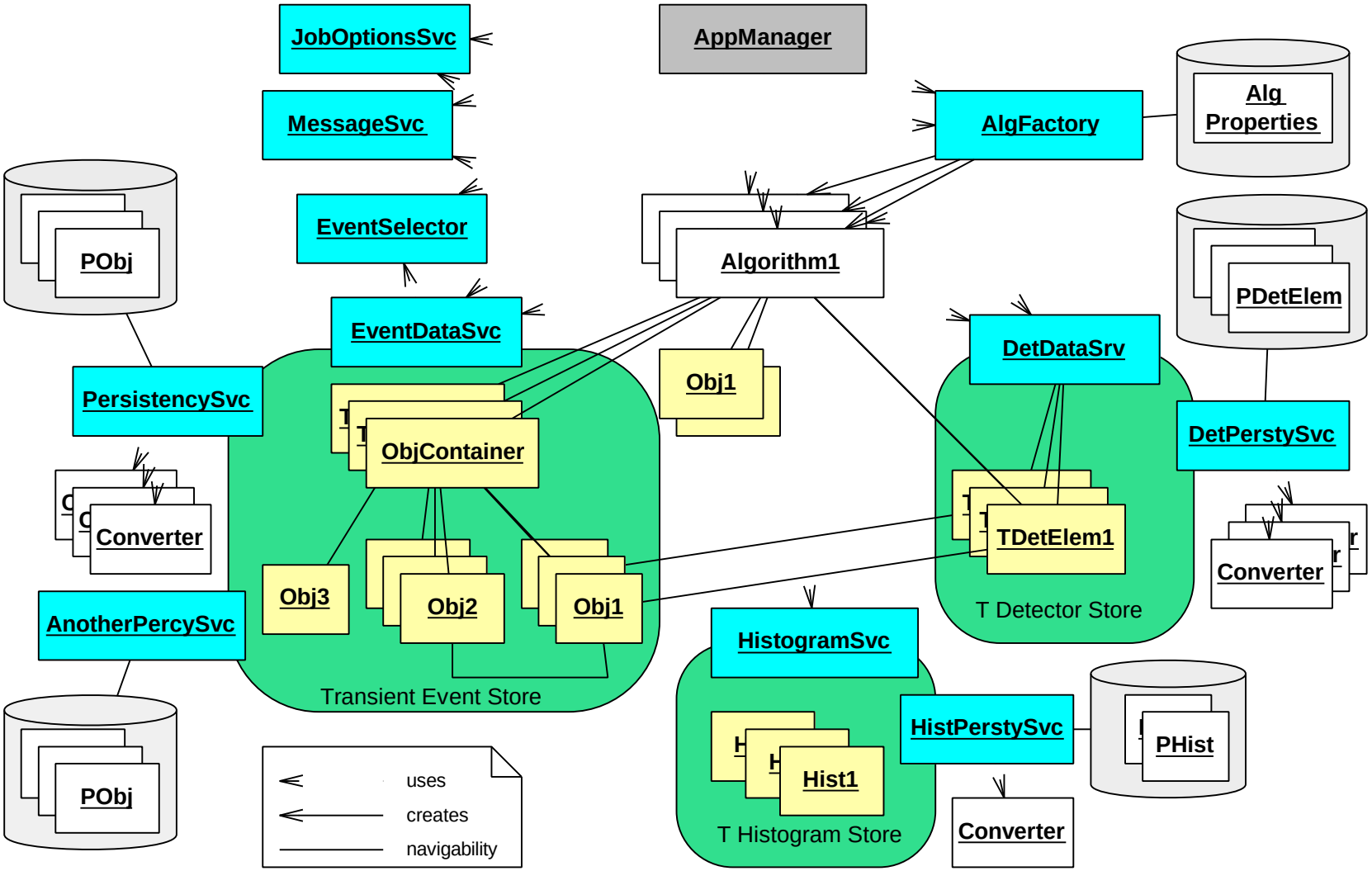
Foreword

- We have started recently (4 weeks ago) to design the architecture of the LHCb data processing applications.
  - Simulation, reconstruction, analysis, high level triggers, etc.
  - The ideas are still very preliminary.
  - The detector description not in the critical path.
- We will try the ideas before end of the year.
- Operational detector description needed by spring 1999.

Basic architectural choices

- Clear separation between “data” and “algorithms”
- Three basic types of data: event data, detector data, statistical data.
- Clear separation between “persistent data” and “transient data”. Data centered architectural style.
- *User code* encapsulated in few specific places: “ Algorithms” and “ Converters”
- All components with well defined “interfaces” and as “generic” as possible.

This week Architecture

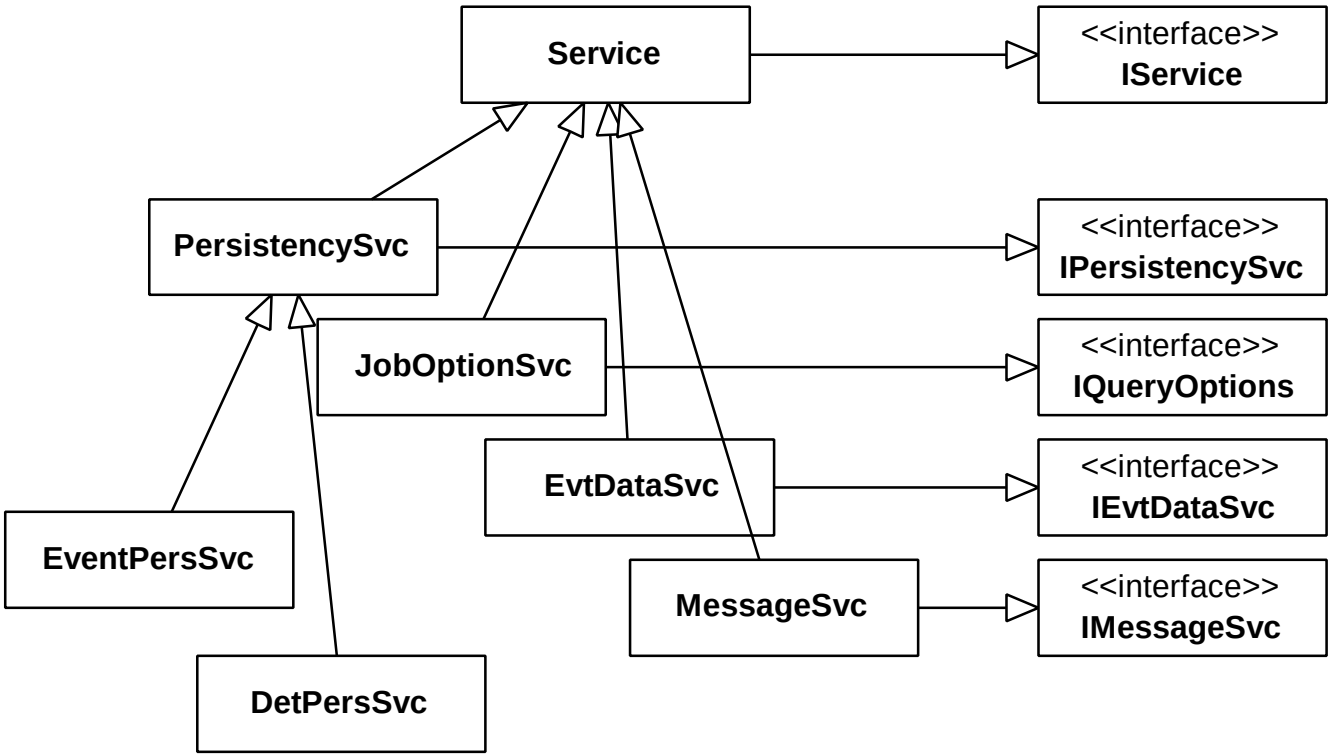


Classification of Classes

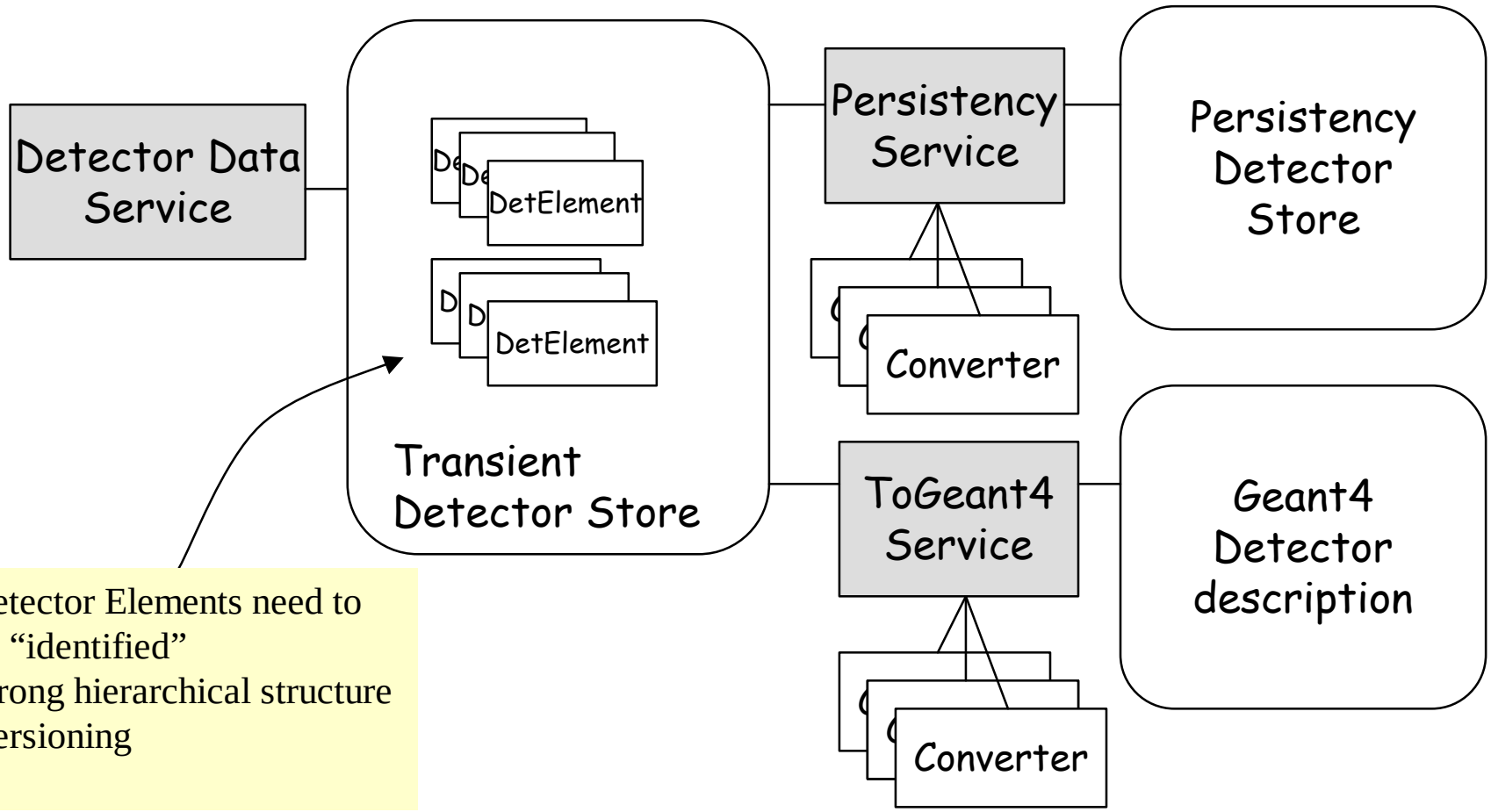
Application Managers	One per application. The chief of orchestra.
Services	Offering specific services with well-defined interfaces. Different concrete implementations depending with specific functionality.
Algorithms	Physics code. Nested algorithms. Simple and well defined interface.
Converters	In charge on converting specific event or detector data into other representation.
Selectors	Components to process a selection criteria for events, parts of events or detector data.
Event/Detector data	The data types that the algorithms and converters are using. No complex behavoir.
Utility classes	All sort of utility classes (math & others) to help on the implementation of the algorithms.

Architecture (class diagrams)

Services

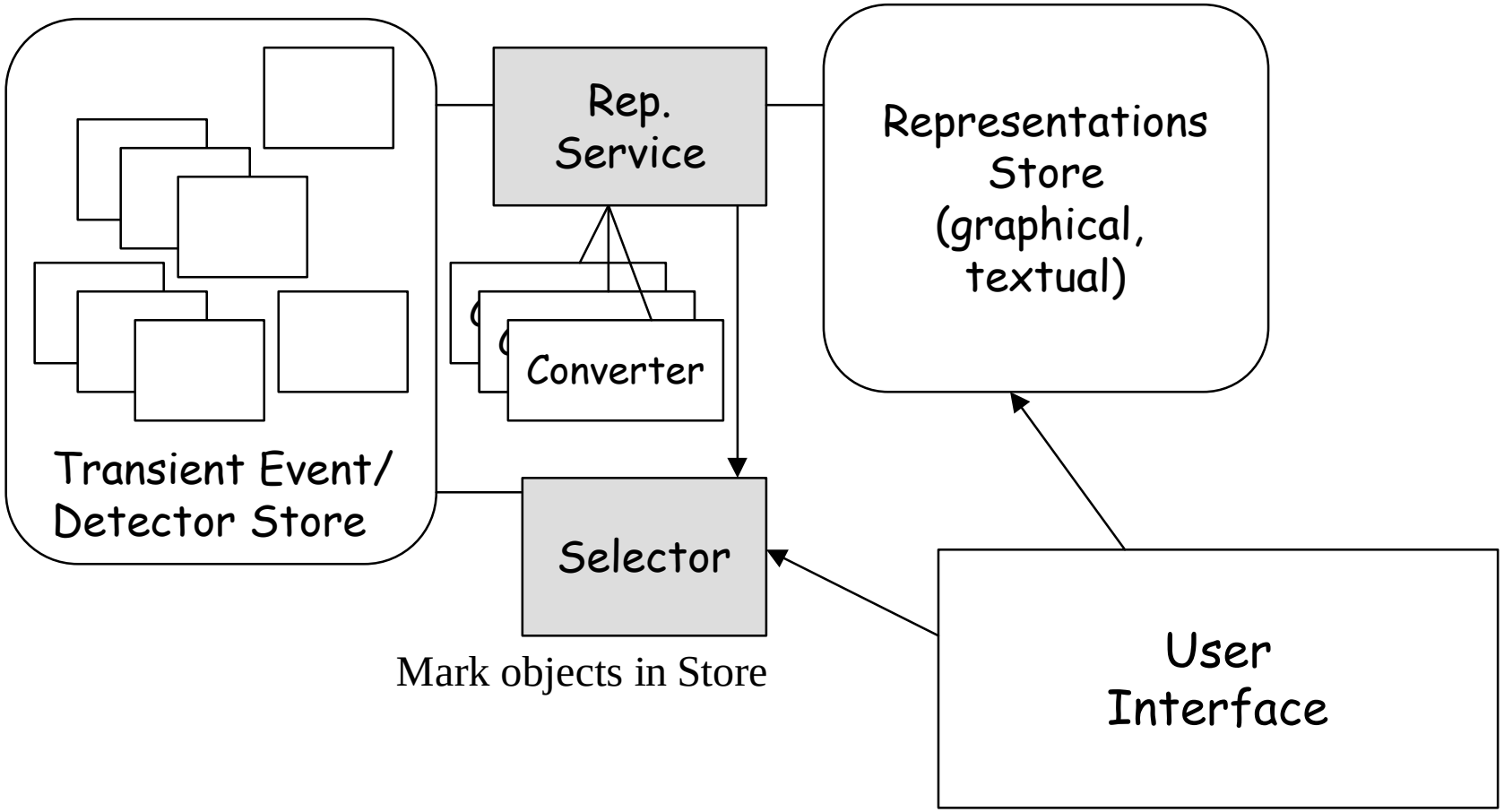


Detector Data Store



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

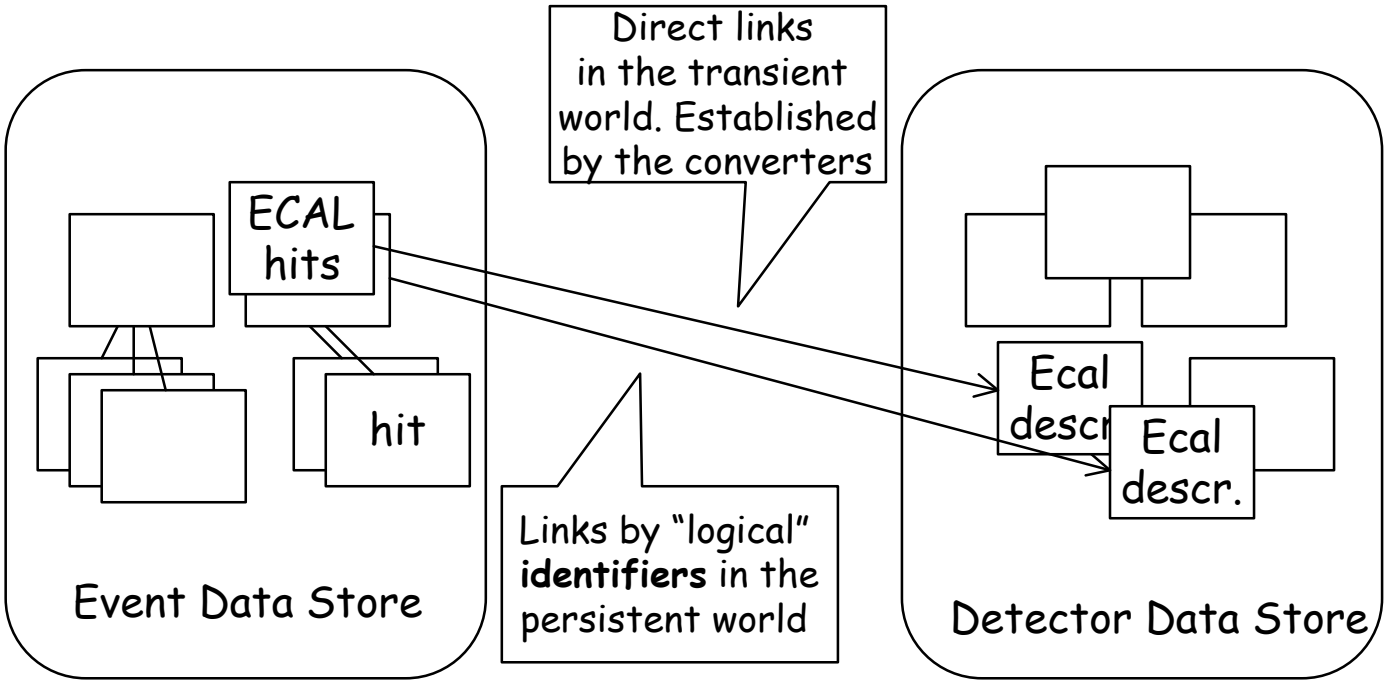
Detector description: Visualization



Detector Description

- It includes:
  - Detector structure (final detector, test beam, etc.)
  - Geometry & Positions (Ideal, Real, Simulation). Versioning based on time, run #, etc. Material.
  - Mapping electronic channels to detector cells. Dead channels.
  - Detector control data needed for reconstruction (time based).
  - Calibration and alignment data.
- The transient detector store contains a “snapshot” of the detector data valid for the event currently being process.

Links between Event/Detector



– A priori different "persistent stores". Logical identification needed.

Summary

- Software architecture currently being designed. Strategical choices being done.
- The different views of the “detector description” will be implemented going through the “transient data store” using a set of converters.
- The Detector Description database will contain a big variety of data related to the detector. Powerful editing tools will be required.
- The schema of the database will be needed soon.