



LAr Testbeam Offline Software Status and Plans

**Combined-Combined TB Meeting
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**Rob McPherson
University of Victoria**



Goals



- 1) **Have working software!**
 - Technical runs: late 2003 / early 2004
 - Beam tests: starting ~ May 2003
- 2) **Close as possible to ATLAS data and code structures**
 - Anticipate standard TDAQ data format
 - Only event-type data in input-stream
 - Heavy use of conditions DB for run, spill, calibration, ... , information
- 3) **Common software with other systems**
 - Essential in particular for H8 TB – need to analyze EMB, Tile, etc. data together
- 4) **Backward compatibility?**
 - May be difficult ...
 - **Possibility: convert old TB data to newer format**



Existing LAr ATHENA TB software: EMB, HEC, EMEC+HEC, FCAL (I) data reading



◆ Event Selector:

- Reads and decodes raw data files, and makes object collections as local data members
 - **EMB and EMEC standalone:** invokes wrapped EMTB code
 - **HEC and EMEC+HEC:** EPIO data reader
 - **FCAL :** New reader for custom data format
- Stores pointers to objects in the **Event Iterator**
 - **Misused data proxy??**

◆ LArXXTBCnv:

- Uses pointers to access objects made when reading event
 - **EMB and EMEC standalone:** makes standard LArTB objects
 - **HEC, EMEC+HEC and FCAL:** objects already LArTB objects
- Stores standard ATHENA and LArTBEvent objects in Storegate

This prescription does not follow the (rumours of) standard ATHENA practice ...

(it does work though)



Plans for LAr 2004 combined TB software (I) data reading



◆ Raw event reader

- Called from Event Iterator??
- Reads (TDAQ-format) data into memory, makes list of pointers to ROD data fragments

◆ Data converters

- Only invoked by Storegate when object collection requested
 - Data proxies? How does this work?
- Reads and decodes TDAQ data fragment(s), makes ATHENA object collections, put into Storegate

**Lack technical expertise ⇒
discussion/tutorial with Srini *et al.* Tuesday**

◆ Note:

- This just covers the “calorimeter event data”
 - LArDigits (time samples), some FEB information, ...
- Non-event data was previously handled in the data converter ⇒ must change in 2004

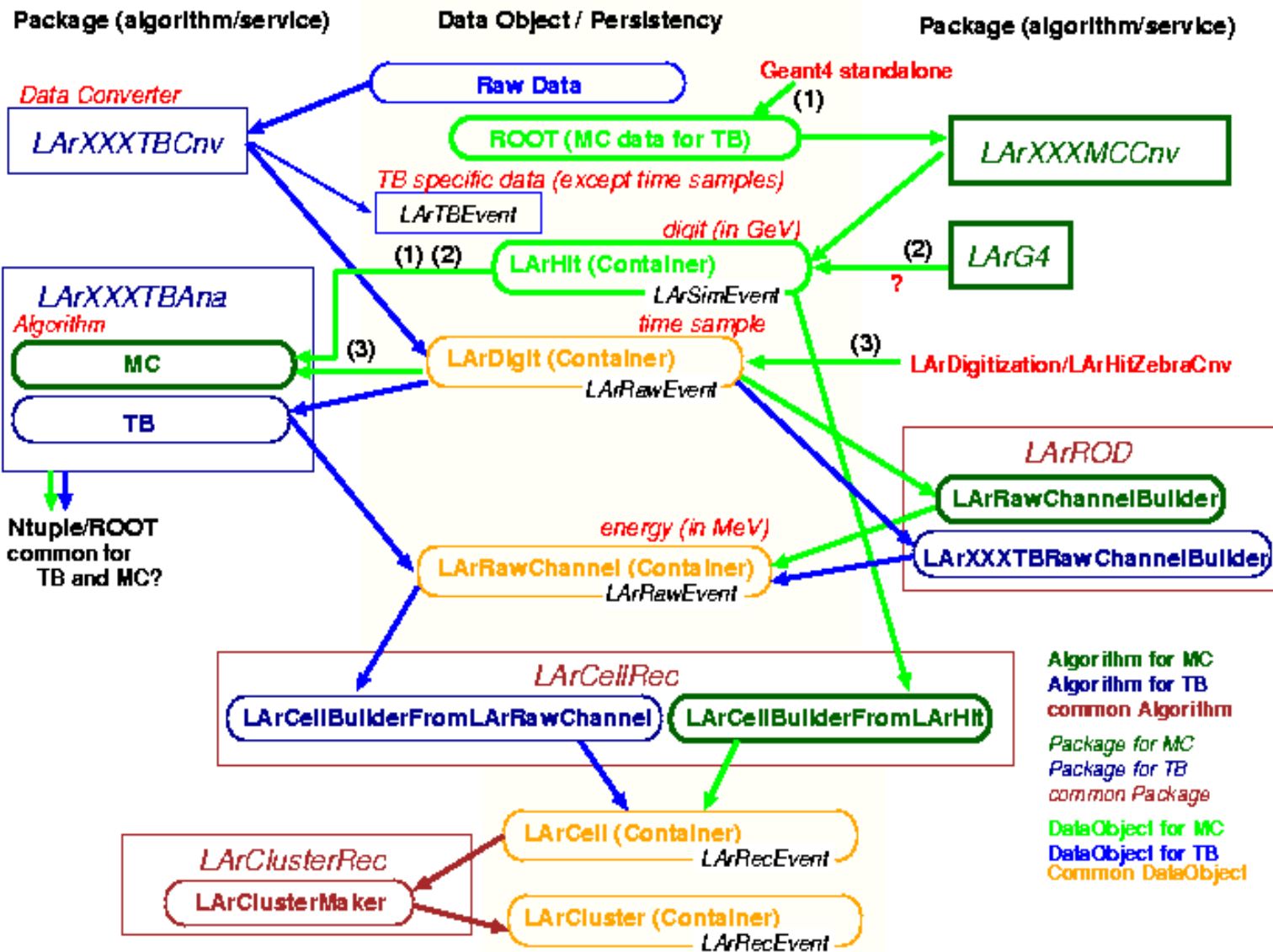


TB software (II) Derived quantities



- ◆ **Many quantities derived from LArDigits (time samples):**
 - **Pedestal unsubtracted/subtracted quantities**
 - **Pulse Height, time**
 - **Polynomial interpolations**
 - **Optimal filtering**
 - ◆ **Different weight calibrations for comparisons ...**
 - **Currently use LArTBEvent etc. for “non-standard” quantities**
 - **Eventually:**
 - **Fill ATHENA LArRawChannel as hook to downstream analysis**
- ◆ **Main question:**
 - **Do we want to make LArTBEvent etc. a non-TB ATHENA for later use in ATLAS commissioning**
 - **The answer is certainly yes, but we may not manage this before 2004 TB runs**

Possible Overview (general)





TB software (III) non-event data



- ◆ **Old TB data streams contain non-event data**
 - Run-type information in run header
 - Run number, cryostat position, beam y position, ...
 - Spill-type information in spill header
 - Spill scalars, ...
 - Slow controls information
 - HV, LV, module temperatures, FEB temperatures, ...
- ◆ **TDAQ data stream does not support non-event data!**
 - All such information written online to conditions DB
 - Information from DAQ: written by TDAQ software
 - Information from DCS: written by PVSSII application
 - Accessible online from conditions DB in ~ real time
 - Current thought (Beniamino *et al.*):
 - Online Book-keeper (OBK) DB with MySQL interface
 - ◆ Current tests: data can be read-back in ~ 20 μ sec



Plans (I) What?

- 1) **Finalize organization of LAr raw event reader, converters, ...**
 - Lafaye, Lampl, Loch, McPherson ... in consultation with LAr software team
- 2) **Write event reader(s), converters**
 - Bazan *et al.* (hope for some help from ATLAS TDAQ group)
 - May generate TDAQ-format input files from old testbeams (would need to read time sample information and fake ROD data – Lafaye?)
- 3) **Experience with TDAQ software, interface with DCS/PVSSII**
 - Ongoing effort from Chekulaev and Karev to set up a TDAQ and DCS workstation and develop the DDC communication system for 2004 TB
- 4) **Agree on common class design for derived LAr TB information**
 - Initially based on existing software structure
- 5) **Agree on common class design for non-LAr (beam etc.) info**
 - Need agreement with other detector groups (Tiles *et al.*).
- 6) **Need experience with OKB conditions DB !**
 - Who? When? Part of TDAQ tests?
- 7) **Need to agree on strategy for MC handling**
 - Much discussion, some plans, no work yet



Plans (II) When?

- ◆ **LAr TB offline software meeting ~ every 2 weeks**
 - **So far: have (hopefully) identified most major issues**
- ◆ **Rumour of a (stealth?) combined TB workshop ~ July 9th**
 - **Clarify plans and common efforts with Tiles *et al.***
- ◆ **Plan a LAr TB software “working days” in early September**
 - **Finalize all design issues**
 - **Allocate (human) resources**
- ◆ **Write code in time for**
 - **LAr EC (H6) technical run: late 2003**
 - **LAr EMB (H8) technical run: early 2004**

Lots to do ...