Testbeam Requirements and Requests

ATLAS Software Week

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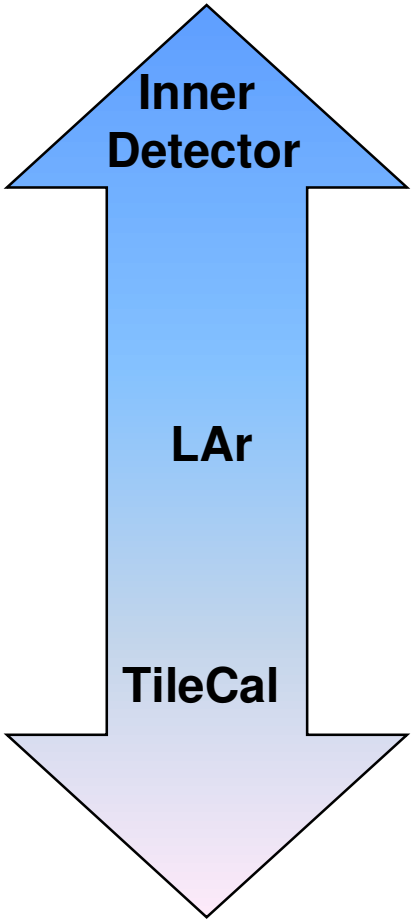
Outline

- Two Testbeam Communities
  - Detector Developers
  - Detector Calibrators
  - They have different requirements
- Developer Community Requirements
- Calibrator Community Requirements
- Assorted other requests

- Some useful links:
  - http://atlas.web.cern.ch/Atlas/GROUPS/SOFTWARE/OO/Architecture/meet/17apr00

Two Reasons for Testbeams

- **As Part of Detector Design**
  - **Prototype detectors are put in the beam and their performance studied**
  - **Analysis must be timely**
  - **Data (usually) is of short-term interest**
- **As Part of Calibration**
  - **Production detectors are put in the beam**
  - **Analysis still must be timely**
  - **Data is of long term interest: it has to be accessible throughout ATLAS operation with the then-current software**
    - Size is manageable: a few TB's.



Detector Designers

- Are taking data now
- Are analyzing data now
  - In general, this data doesn't have to be easily accessible in the distant future
- This work will go on no matter what happens in this room.
  - They are presently working in a "standalone mode"
- Our challenge is to bring these people into the fold: get them to do their development within the framework.
  - Some (e.g. Liquid Argon & ATLAST) are

Detector Calibrators

- Will begin taking data in July (Tile)
- Data must be accessible for the life of ATLAS
  - Readable within the then-current framework
  - It is probably not necessary to contain both an old calibration event and a current pp event in memory at the same time.
  - Data is a small fraction of the pp collision data
- Calibration and Run Conditions databases necessary
  - Presently, detector groups are using their own
  - Can an ATLAS-wide solution be ready in time?

TileCal: Why Objectivity?

- **Last run, we wrote data in ZEBRA format**
  - **Analyzed data on-line with “TileMon”**
  - **Copied the data into Objectivity**
  - **Analyzed data off-line with TileMon, OO “Pilot” software, and ntuples**
- **There is a strong desire within the Tile community to have only a single analysis program for on- and off- line**
  - **If we want to continue OO analysis, that means we have to make it work in the online environment**
  - **The most straightforward way to do that is by dropping ZEBRA**

Why NOT Objectivity?

- **Speed**
  - **Expect data at 3 kHz for Tile**
  - **Objectivity benchmarked at 75 Hz**
  - **This is a little mysterious**
    - Pilot software spends 90% of its time in ZEBRA and 10% in Objectivity
- **Too "Heavyweight"**
  - **Liquid Argon requests Root I/O (for benchmarking as well)**
  - **The real requirement (how heavy is too heavy?) is murky**
- **It's not 100% obvious to me that Objectivity can't be made to work**

Tile Plans & Requirements

- **We need to move data from ZEBRA to whatever the ATLAS-wide format is:**
  - **We don't want to do this over and over again**
  - **Right now, Objectivity seems not to be the right solution at the DAQ level**
    - I understand BaBar came to a similar conclusion
    - Tile doesn't want to invent its own format
- **We want access to testbeam data to look the same to an application as pp data**
  - **Some algorithms will be developed under testbeam**
- **We want a calibrations and run conditions database**
  - **We want to use the ATLAS-wide solution**
- **Testbeam data arrives in a few months (May run is over!)**

Other Requests

- **Pixels**
  - **Presently, they "do everything themselves"**
  - **Would like to have support in adapting their code to the framework**
  - **Would like to store their data at CERN**
- **Overall**
  - **Lots of interest in comparing GEANT3/GEANT4 data with testbeam data**
    - Does this mean we need to bring simulated data along too?
    - Do we have a chicken and egg problem here?
      - We can't do everything first