
Software Common Task Group Report

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Composition & Recent Activity

- Software Common Task Group members:
 - Akiya Miyamoto (convener)
 - Norman Graf (deputy)
 - Yen-chu Chen
 - Frank Gaede
 - Corrado Gatto
- Preparing the Letters of Intent has been sufficiently demanding of our time that essentially all of the activities of the Common Task Group have been directed towards that effort.
- We have met formally at LCWS08 and TILC09 to discuss a number of issues and plan our near-term post-LOI activities.

The LOI Physics Benchmarks Process

- The full-detector simulation physics benchmarking represents the main difference between the LOI and the DOD & DCR exercises.
 - Although still far from “real”, the physics benchmarking requirements presented us with a large-scale, end-to-end exercise which stressed most aspects of the software systems.
 - Event Generation
 - Detector Simulation
 - Event Reconstruction
 - Physics Analysis
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Event Generation

- A number of important issues in the common data sample event generation were unresolved at the time of the transition from the WWS, regional-based software working group to the ILC/GDE, concept-based software panel.
- All concepts used events from a common pool, but details varied.
- Details matter! Will strive to ensure that future exercises will be more rigorously defined.

250 GeV SM Sample

- We used a copy of the guineapig acc.dat file in which do_isr was turned on to generate the input luminosity files for event generation.
- This resulted in an incorrect beamstrahlung distribution in the MC event samples.
- The resulting distributions were dominated by the input spectrum, masking differences in the intrinsic detector performance.
- An error was made, but resulted in a “fail-safe” state where all concepts were affected.

250 GeV SM Sample post-LOI

- The correct luminosity files have been generated using guineapig, including the corrected (asymmetric) electron and positron beam energy spreads.
- eeh and $\mu\mu h$ signal samples for the higgs recoil analysis have been generated and made available to the concepts.
- Background samples are being generated and will be made public.
 - Expect the concepts to handle backgrounds differently (e.g. some may reweight existing samples instead of rerunning new events).

Other event sample issues

- A zero-mass approximation for muons in some whizard processes (reported by the 4th concept) caused an excess in the amount of bremsstrahlung. This, too, has been fixed in the post-LOI samples.
- We will make sure that any additional event samples generated by concept groups in response to specific IDAG requests will be made publicly available, where appropriate.
- Thanks to Tim Barklow for single-handedly regenerating these events.

Common Tools

- Briefly discussed possible areas of common work. For example:
 - MarlinkinFit was used by all three concepts.
 - LCFIVertex was used by ILD and SiD (4th using RAVE)
 - Concern about continued support of this package.
 - Initial discussion on common geometry system for reconstruction between ILD & SiD.
- Agreed in principle that the sharing of common tools should be encouraged.
 - Marked differences in level of interoperability between concepts.

LCIO

- Access to a common event data model and a common persistence format played a large part in the successful merger of the LDC and GLD concepts into ILD.
- Events from SiD Java-based reconstruction were further processed using MarlinReco.
 - No need for a single monolithic framework.
 - Functionality of the tools themselves and common event data model more important than the framework into which they plug.
- Discussions initiated on LCIO2.0 in response to user experiences to-date.

LCIO



slic

org.lcsim

MOKKA

MarlinReco

JUPITER

Satellites

LCIO

Common Data Model

Common IO Format

Interoperable Reconstruction Geometry

Also successfully used by several experimental groups for their testbeam data.

← missing

Root

- Long history of using Root in LC Physics and Detector studies.
 - LCDRoot (Toshi Abe & Masako Iwasaki) Sitges99
 - JSF/SimTools
 - ILCRoot
- Discussions within ILD on possible integration or usage of Root
 - for I/O: using Root I/O in LCIO
 - for histograms and trees
 - fast interactive user analysis – (e.g.: a la JSF macros)
 - for application framework
 - details to be evaluated/studied

Beyond the concepts...

- “How LC software could profit from LHC software” presented by Pere Mato.
 - Number of topics and issues raised, but no time for discussion during the session.
 - We should come back to this! (Not clear to me personally if there is any interoperability between the LHC experiments.)
- Discussions with CERN CLIC group
 - Initiated last year (CLIC-ILC & CLIC08).
 - During TILC09.
 - Meeting scheduled at CERN, May 28-29.

The Grid

- Both ILD & SiD made extensive use of the LCG grid.
 - ILD (DESY, in2p3, UK,...)
 - SiD (RAL Tier 1)
- In general, no problems with the concept software
 - ILD software (Mokka & MarlinReco) ran very stably.
 - SiD software (slic & org.lcsim) just worked (also ran MarlinReco).
- Number of issues with Grid job submission, monitoring and file transfers.
- Grid is still high-maintenance & very LHC-centric.
- In the end, responsible for successfully processing many tens of millions of events.

Going Forward...

- Highest priority will be to respond to IDAG requests regarding LOI.
 - Need to make it past Albuquerque
- We need to understand the needs of TDP-1 (Summer 2010) and TDP-2 (2012).
 - Not that far away, so very little lead time if new functionality needs to be provided.
- Software Common Task group will start holding regular meetings.
 - Proposed date is about a week before the Physics and Experimental board meeting, which is held about once per month.