Software workshop summary

Helge Meinhard / CERN-EP

Atlas software workshop

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Tutorials

- Configuration management (A. Khodabandeh)
  - Good introduction into what the problems are, the terminology, possible ways of problem solving
  - Choosing the tools is secondary!
- OODBMS for HEP (D. Düllmann)
  - Reminder of basic Objectivity features
  - Practical examples: define persistent classes, create federation, create event objects
  - HEPODBMS shields against vendor dependencies, provides more functionality

Changes in Atlas Computing

- Action plan following the computing review
  - Aim at bringing communities together, obtain institutional commitments
  - Architecture task force, quality control group, national board, system s/w coordinators and task leaders (reconstruction, simulation, data base)
  - Unavoidable uncertainties during transition period
  - Mandates for computing coordinator (project leader for core software, coordinator for system software) and physics coordinator (set requirements and verify performance)

Changes in Atlas Computing (cont'd)

- Discussion
  - Need for clarification:
    - Overall reconstruction, simulation, data base coordinators (full time effort needed)
    - Chief architect (full time effort needed)
    - Role of CERN team, in particular ATC group
    - Role of domains not taken into account in action plan
    - Steps and time table for new organisation
    - To which extent should previous activities go on?
    - Communication channel between architecture task force and systems
    - Role of regional centres in software effort

Changes in Atlas Computing (cont'd)

- Discussion (cont'd)
  - Other issues
    - Delay in starting task forces worrying
    - Schedule tight for end 1999 status report to LHCC
    - Criticism that computing community has not been consulted
    - Hope that people will still look at changes in a positive and future-oriented spirit

Repository and releases

- Mostly stable production software, C++ software evolving steadily
- Platforms: HP-UX, Linux, DUX, Solaris, AIX
- Release ~ every two weeks, nightly builds
- Production release in preparation
- Problem areas:
  - Generators outdated
  - List of people responsible of packages
  - Building both optimised and debug
  - Deputy librarian
  - SRT maintenance
  - Non-global releases, sharing of binaries

TDR software and productions

- Dice frozen 2/98 (except muon geometry)
  - Decision about ID geometry change
  - Cvs version to be checked
- Reconstruction: more moving target
  - Not all algorithms in repository, particularly for combined reconstruction
  - CBNT very useful tool, should be replaced by something more powerful in future software
- Simulation production well organised, suffering from manpower
- Reconstruction production more ad hoc, user driven - information not centrally available

Platforms, other Focus issues

- CERN-IT proposal: concentrate on Linux and NT/2000 on Intel, end date for support of commercial Unixes, discourage investments in Risc
- Storage strategy: 3 levels, HSM for second one - HPSS for time being, but study alternatives. Decision only when needed
- New printer architecture, print clients
- LHC++, Geant4 distribution scheme
- Changes in IT division

LCB workshop

- Marseille, France, 28/09 to 01/10/99
- Topics: Architecture, technology tracking, world-wide computing, simulation, analysis tools
- Rapporteurs to introduce discussions
- Steps to be taken:
  - Propose rapporteurs and conveners
  - Guidelines concerning issues to be discussed
  - Propose and prepare Atlas contributions

Simulation

- Geant 4 status and experience
  - Generally in good shape, surpassing Geant 3 in most areas of physics processes in terms of completeness, correctness, and performance
  - Major experience in Atlas, CMS, BaBar, Borexino
  - 4.0.1 in May, 4.1.0 in late July 99

Simulation (cont'd)

- Atlas activities: CHAOS project
  - Core group for definition of categories, high-level design
  - Numerous prototypes (muon system, silicon tracker, Tile test beam, TRT, …); many bugs in Geant 4 found and fixed
  - Training courses
- TRT test beam simulation with Geant 4
  - Uses G4 particle gun, all physics processes
  - Used G4 tools to debug geometry
  - Results (energy deposit, no of hits) good for incident pions, problems for electrons

Training

- National contact persons being nominated
- Courses at CERN being organised (hands-on OOAD and programming)
- Consultancy: use developer mailing list
- Pushing for C++ tutorials by IT division
- UCO in building 40
- Recommendations for books, CDs, videos on the Web
- To do: de-centralised training, walkthroughs

CASE tools for Atlas

- Questionnaire to investigate user experience and expectations
  - More than one tool
  - NT, Linux, Solaris
  - Must be customisable
- 12 tools looked at
- Rose falling short on UML support, bad on Unix
- Candidates: StP version 7 (much improved), Together (Java, reasonably priced), Argo (Java, OpenSource, free - buggy, no C++ as yet)

Reviews

- SRT documentation and design: waiting for updated deliverable
- Muon code, graphics code: waiting for feedback from one reviewer
- Handling of comments not to be resolved in review process: ask QC group
- Discussion: All are encouraged to submit their work (design or code) for reviews, contact Steve Fisher

Analysis Tools Workshop

- Requirements
  - Most important that they are complete; assignment of domains, formality not relevant now
- Architectural issues: strategic choices
  - OO, C++, components, migration of code from one application domain into another, independence of specific tools
- StAF: Analysis framework for Star, Phenix, …
  - modular, industry standards (Corba, XDR, scripting)

Analysis tools workshop (cont'd)

- Event status
  - Raw data from Objy
  - Work started on general tools for ESD and AOD
  - Need analysis scenarios to proceed
- Evaluation of tools
  - Analysis scenarios
  - Available tools, areas of interest
  - Questionnaire? HEP wide coordination activity?
- MLPfit: Neural network based on perceptrons
  - Implements most efficient learning phase
  - Interfaces: Ascii files and histograms, API, LabView, PAW

Analysis tools workshop (cont'd)

- Data mining
  - Knowledge discovery in large data volumes
  - Possible directions: Grand Challenge, data trains / carousels, rough sets
- Graphics for analysis
  - Reminder of main aims, design criteria of graphics
  - Status of all packages

Analysis tools workshop (cont'd)

- ATLFAST++ and LHC++
  - Eliminating dependencies on Root, comparing results with Fortran version, simple event collection in Objy
  - Test bed for analysis tools, Monarc
  - Future strategy for Atlfast/Atlfast++ to be defined
- Java agents
  - Steer distributed execution (serial and/or parallel) on many nodes (job to data)
  - Platform independent, no O/S changes
  - Prototype developed in CSC
  - Difficult to integrate C++

Spider, SRT

- Spider on hold, likely to die
- SRT: some functionality problems
- Unlikely that a Hep-wide SRT will arise
- Proposal: go ahead with requirements and wish list, review, evaluate existing solutions
- Many constraints…

Data base WG

- Production data base workshop: agreement on identifiers for built parts, recommendations for tools to follow
- Detector description: Infrastructure exists, organising working meetings with systems
- Simple persistency: single-user prototype (questions and comments on strategy)
- Monarc test bed on Objy: study performance on distributed federations

Graphics WG

- Plans and schedules
- Recommendations for use of XML

Reconstruction WG

- Atrecon: lots of work done for physics TDR, needs consolidation
- OO projects ongoing, Arve to be clarified
- End 99 milestone: ID in good shape, questions about calo and muon
- Muon identification, OO Kalman filtering in L2
- Common classes (Track!) emerging

World-wide computing WG

- Introduction to Monarc
- Activities centered about regional centres
- Assume 1/3 of CERN's resources for single experiment
  - Thinking going on everywhere
  - Different levels of confidence that goals can be reached
- Sophisticated simulation exists
- Objy over WAN tests

Atlas feedback for LCB workshop

- Atlas contributions: event scheme, detector description, Atlas part of Monarc, Geant4 experience, analysis tools
- Rapporteurs: emphasis on simulation
- Contributions: abstracts by mid June (Atlas deadline)

Preliminary remarks by McCubbin

- Assuming CB approval, ramp-up to 80% steady state in October 1999
- OO hoped to overcome Brookes' law
- Software MOU useful to get commitments
- Physics and software in symbiosis - one community
- Suggestions, thoughts, ideas, solutions… to Norman