Proposal of a CoE in "Physics at the extreme scale"

WP5 - High-speed real-time data processing

Mauro Morandin - 3 Sep. 2014

Agenda of the meeting

- News from the project management (L. Tripiccione) – 10'
- Group consolidation (M. Morandin) – 10'
- Updates on the evolution of the activity description documents (5-10' each)
  - A1 Maximum Likelihood Fits on Heterogeneous Many Core Architectures (M. Rotondo)
  - A2 Exploitation of HPC clusters for LHC data intensive workflows and analysis applications (A. Washbrook/P. Clarke - F. Giacomini)
  - A3 Development of a parallel framework for LHC real time filtering applications (M. Corvo/ M. M.)
  - A5 Exploitation of HPC centers for large scale Monte Carlo and detector simulation application (S. Wenzel)
  - A6 SKA Real time Data ingestion and pseudo-real time data calibration (J. Yates)
- Next steps (all)
- AOB

Groups in WG5

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- The current groups participating are listed in the spreadsheet I circulated in August
  - available in our google drive repository
    - b.t.w.: we probably need to restrict the access to the CoE collaboration members: is there any obstacle in using gmail accounts ?
- we decided to keep the discussions related to LHC and SKA activities within WG5, but by the time of the WS in Ferrara, the final assignment to the WG will have to be finalized

Consolidating the LHC contributions

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- two CERN groups have joined the collaboration
  - GEANT4 development group: F. Carminati et al. (PH-SFT)
    - SoFTware Development for Experiments
  - LHCb online group: N. Neufeld at al. (PH-LBC)
    - LHCb experiment Computing
- the first group will work on the activity:
  - **A5 Exploitation of HPC centers for large scale Monte Carlo and detector simulation applications**
- the second will provide a solid base for the developments related to the activity
  - **A3 Developments of a parallel framework for LHC real time filtering applications**

Additional possible contributions II

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- **A4 Performance optimization tools**
  - main topic: evolution of open source profiling tools developed within the LHC community (IGProf) to encompass heterogeneous architectures
  - there is interest in at least one INFN theoretical group, so this would be an activity involving both exp. and theor. colleagues
  - we will prepare a description of the activity in the next couple of weeks

Next steps

- by Sep. 14 we need to have ready the components to be included in the proposal document, both general and activity-specific
- the proposal template is available
  - see: http://ec.europa.eu/research/participants/data/ref/h2020/other/call_ptef/pt/h2020-call-pt-ria_einfra_en.pdf
- the call will open on 24-09-2014
  - deadline 15-1-2015

Topics to be addressed in the proposal

- **Provision of services**, such as:
  - developing, optimising (including if needed re-design) and scaling HPC application codes towards peta and exascale computing;
  - testing, validating and maintaining codes and managing the associated data;
  - quality assurance;
  - co-design of hardware, software and codes;
  - consultancy to industry and SMEs;
  - research in HPC applications;
  - addressing the skills gap in computational science.
- Working in synergy with the **pan-European HPC infrastructure**
  - including by identifying suitable applications for co-design activities relevant to the development of HPC technologies towards exa-scale.

Topics to be addressed (II)

- **Sustainability** embracing a wide range of service models and funding from a mixture of sources, including through sponsorship by industry or hybrid public-private models. Clear business plans are expected to be presented in the proposal.
- **Creating communities** around specific codes that impact the target sectors, involving ISVs (independent software vendors) where appropriate, and exchange of best practices in particular for SMEs.
- A **governance structure** driven by the needs of the users. Commercial management expertise will be needed along with technical expertise to manage industry clients and supply chains, in addition to users from academia.

Expected impact

- How are going with our activity to get:
  - **Improved access** to computing **applications** and **expertise** that enables **researchers** and **industry** to be more **productive**, leading to scientific excellence ?
  - Improved **competitiveness** for companies and SMEs through **access** to CoE **expertise** and **services** ?
  - European **leadership** in applications that address **societal challenges** or are important for **industrial applications** through better **code performance** and **better code maintenance** and **availability** ?
  - More **scientists and engineers trained** in the use of **computational methods** and **optimisation of applications**

Some questions to be considered when planning our activities

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- what kind of expertise are we going to create and how ?
- what services are we going to provide to researchers ? and industries ?
- what collaborations are we pursuing with the Pan-european HPC infrastructure ?
- what communities are creating/consolidating around specific
- what is the business model to support the services ?