

Towards an HL-LHC Scientific Software Innovation Institute (S2I2)

Goals, Governance, and Management

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Let's Get Started



Some Key Ideas for an HL-LHC Scientific Software Innovation Institute

- **should serve as an intellectual hub for HEP software and computing, with the primary goal enabling the best possible HL-LHC science; should also serve as a bridge to computer science;**
- should develop algorithms and build prototype software for use by the HL-LHC experiments;
- should embed some of its developers inside the LHC experiments to help them develop and deploy the software they need;
- should develop community software.

From the Proto-HSF Meeting

<https://indico.cern.ch/event/297652/>



U.S. DEPARTMENT OF

ENERGY

Office of
Science

HEP Software Collaboration Governance, Fermilab Perspective

Panagiotis Spentzouris, with Daniel Elvira and Rob Roser
HEP Software Collaboration Meeting
CERN, April 3rd 2014

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HEP Computing Facing Many Challenges Ahead

- Supporting current and future HEP program requires significant resources and infrastructure (e.g. HL-LHC)
 - resources (funding) are becoming a limiting factor
- Evolution of computing architectures and software technologies calls for major software re-engineering and could impact our software development model
 - multicore/many-core, accelerators (GPU, MIC, ...), ARM
 - reduced footprint of memory/core
 - the emergence of cloud concept as a scientific computing tool
- Software engineering a necessity not just a “best practice” requirement
- Leveraging resources and expertise, and coordinating existing efforts in the field at large is an appealing solution to overcome resource and funding limitations

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HEP Software collaboration

- A collaboration that leverages and coordinates HEP software activities could
 - Provide consistent strategy and maximize resource deployment efficiency
 - Enable contact with other scientific fields to contribute either resources or software development
 - Many of our tools have broader applicability for science outside HEP
 - Generate new funding opportunities outside our traditional funding “sandbox”
 - increase visibility and appeal of our software efforts

Stakeholders

from the inside, moving outwards

- the NSF and the S2I2 team;
- the US-LHC community;
- the LHC experiments;
- CERN, the DOE labs, and the DOE;
- the wider HEP software world;
- the wider scientific software world, explicitly including computer science, software engineering, information technology, networking, etc.

Management and Governance

Layered and Overlapping Responsibilities

- The Principal Investigator will serve as Executive Director and will be the point-of-contact to the NSF.
- The PI and four Co-PIs (from different institutions) will serve on the Executive Board (EB); others may be asked to serve; the EB will be responsible for allocating resources on an annual basis;
- A Technical Board (TB) will comprise the Executive Director and Project Leaders; it will monitor and guide the work done by the various S2I2 projects; it will also
- A Steering Committee will comprise stakeholder representatives; it will advise the Executive Board.
- An Advisory Board will be appointed to provide an external perspective; the members will be chosen for their scientific software and other domain expertise. They will review the S2I2 semi-annually.

Operational Structure

Some Ideas

The Institute will serve as intellectual hub for HEP software and computing R&D, and it will house projects focused on enabling the scientific success of the HL-LHC experiments.

- The Institute will **house a Developer/Expert/Consultant pool** that will both develop algorithms and prototypes, and work with experiments to develop and deploy experiment-specific software;
- The Institute will **directly sponsor 3 – 4 projects** (of ill-defined duration) led by members of the Institute and (primarily) funded by the Institute;
- The Institute will **engage the larger scientific software world** through its own workshops, sponsoring participation in other workshops and conferences, and providing Fellowship opportunities for individuals to participate in activities beyond their home domains;
- The Institute will **provide a forum and mechanisms for evaluating software** developed by others for use in the HEP world.

Call to Action

Get involved.

Encourage your colleagues to get involved.

Now.