HEP Software Foundation (HSF) Initiatives

Pere Mato (CERN) for the HSF Startup Team

CMS Fall O+C Week, CERN, October 15 2015
Motivations

- Much of our HEP software is now old (> 20 years) and needs to be adapted to more modern standards
- Paradigm-shift resulting from the evolution of CPUs
- Use of all resources available to our community such as HPC, commercial clouds, volunteer resources
- Must attract people with the required advanced skills and experience
- Ensure interoperability with software developed by other scientific communities
- Opportunity for sharing software between different experimental programs
Objectives

- Share expertise
- Raise awareness of existing software and solutions
- Catalyze new common projects
- Promote commonality and collaboration in new developments to make the most of limited resources
- Aid developers and users in creating, discovering, using and sustaining common software
- Support training career development for software and computing specialists
- Provide a framework for attracting effort and support to S&C common projects
- Provide a structure to set priorities and goals for the work
- Facilitate wider connections; while the HSF is a HEP community effort, it should be open enough to form the basis for collaboration with other sciences
HSF Timeline

- Jan 2014: HEP software collaboration proposed
- Apr 2014: HEP software collaboration meeting
- Spring/Summer 2014: gathering White Papers from the community.
- Oct 1 2014: Startup plan approved and startup team established. Agreement communities and software domains to focus on initially.
- Nov 11 2014: White Paper Analysis and Proposed Startup Plan released, followed by discussions and contact meetings with many parts of the community prior to the SLAC workshop.
- Jan 20-22 2015: SLAC HSF workshop established concrete activities and next steps for the HSF.
- Mar 3 2015: Working groups, services, activities emerging from the workshop established.
- Apr 17, 2015: HSF meeting at CHEP 2015, Okinawa to present progress, assess opportunities emerging from CHEP, and discuss next steps.
Startup Team

- Amber Boehnlein (SLAC)
- Peter Elmer (Princeton)
- Daniel Elvira (FNAL)
- Frank Gaede (DESY)
- Benedikt Hegner (CERN)
- Michel Jouvin (LAL, IN2P3)
- Pere Mato (CERN, co-lead)
- Dario Menasce (INFN)
- Elizabeth Sexton-Kennedy (FNAL)
- Graeme Stewart (Glasgow)
- Craig Tull (LBNL)
- Andrea Valassi (CERN)
- Brett Viren (BNL)
- Torre Wenaus (BNL, co-lead)
## HSF Working Groups

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Communication and Information Exchange

- HSF Web
- Mailing Lists (Fora)
- Knowledge Base
- Technical Notes
- Newsletter Proposal
HSF Website

- [http://hepsoftwarefoundation.org](http://hepsoftwarefoundation.org)

The HEP Software Foundation
*Advancing high energy physics community software*

- **New Main pages (tabs)**
  - **Community**
    - HEP software and computing job offers
    - Other projects related and/or relevant to the HSF
  - **Technical Notes**
    - Easy access to TNs
Mailing Lists: Update

- HSF Forum
  - [http://groups.google.com/d/forum/hep-sf-forum](http://groups.google.com/d/forum/hep-sf-forum)
  - 114 members
- HEP S&C community website
  - 222 people have signed up, a small increase from the 163 pre-workshop
- Other specialized lists
  - Training - [hep-sf-training-wg](http://groups.google.com/d/forum/hep-sf-training-wg)
  - Packaging - [hep-sf-packaging-wg](http://groups.google.com/d/forum/hep-sf-packaging-wg)
  - General HSF technical discussion forum - [hep-sf-tech-forum](http://groups.google.com/d/forum/hep-sf-tech-forum)

- Reminder: Google-free self-signup to lists
  - Simply send a mail (subject and content irrelevant, can be empty) to `<listname>+subscribe@googlegroups.com`, e.g. for the list above, `hep-sw-comp+subscribe@googlegroups.com`
- See the ‘Get involved’ page on the website for details
Topical Fora

● Concurrency Forum
  ○ Technical issues to embrace concurrency in our software
  ○ Ongoing activity

● Reconstruction Algorithms Forum
  ○ All matters of event reconstruction and pattern recognition
  ○ Not yet really started

● Machine Learning Forum
  ○ ML discussions and code development in the context of HEP
  ○ Development of relevant tools, methodology and applications
Knowledge Base

- **Software catalog, software categories, science fields, community, and events**
- Developing new implementation (data migrated from Drupal). Main points:
  - data moved to DKB (data knowledge base prototype initiated in ATLAS) entity-relation schema in mysql
  - implementation is a browser-based app (javascript client, node.js server, json in between, MySQL)
  - authentication is via github, google, facebook etc.
  - emphasizes easy adding/editing of content, and extensibility. Adding content should be fun.
- Preview: [http://hepsoftware.org](http://hepsoftware.org)
  - Comments/feedback are welcome!
Technical Notes

- First TN with the TN policy has been published
- Notes can be proposals, ideas, whatever people want to add
- 3 more notes in preparation:
  - Licence Guidelines, Naming conventions, Brett Viren paper
- Repository and version control in GitHub
HSF Newsletter

● An attempt to improve the communication about what we do
  ○ probably our minutes are not read by many…
● Thus the idea of a curated information distributed as a HSF newsletter
● Monthly?
● We probably need to do it once to make an example of what it could be
● We’d really appreciate your comments and suggestions
Training

• **Document** developing HSF training and education plans

• Developing the training platform:
  ○ [WikiToLearn](#) site gaining momentum, people are starting to put material in, not all is relevant to HSF but some is

• HSF training and education working group forum
  ○ An open google group discussion forum, you are welcome to join and participate
  ○ [hep-sf-training-wg](#)
Software Packaging

● Topics
  ○ package building, deployment, runtime environment, new technologies like Dockers

● Organized a series of discussions/presentations on packaging and build tools (5 meetings)
  ○ Current practices at CERN, FNAL, Experiments, etc.
  ○ Ongoing discussions in hep-sf-packaging-wg
  ○ Document to summarize findings being prepared

● Agreed on the usefulness of common tools, which can be used to assemble individual software stacks

● HSF Organization in GitHub
  ○ https://github.com/HEP-SF
Software Licensing

- TN draft of the HSF Licensing Guidelines is being discussed in the technical forum
  - Plan to finalize it in 2-3 weeks
- Background information on open source licences approved by the Open Source Initiative
- Set of recommendations for choosing a licence and instructions for drafting text to include with the source code
Software Projects

- The essence of the Foundation are the **Software Projects** under its umbrella
  - HSF does not enforce any particular software process, project management or methodology, however packages should conform to some standards to facilitate integration
- Defined preliminary **Project Guidelines**
  - Project name, public repository, web site, issue tracker, version naming, mandatory documentation, best practices,...
Software Projects (2)

- The idea is to develop a project template implementing these guidelines
  - For example using the PODIO project (Toolkit for Event Data Models) as guinea pig developed under the AIDA 2020
- Prototype template available at https://github.com/HEP-SF/tools
Development Tools and Services

- Not much progress
- Offer from TechLab (Okinawa meeting)
  - Willing to support the goals of the HSF
  - Offer access to its systems
  - Collaborate with other organisations with similar systems
  - Participate in joint initiatives
- Plan to set up services such as Coverity (static code analyser)
  - Provide analysis report for any HEP software project
Conclusions

● We have made progress in some areas but on a lower pace than anticipated
● Areas for which we would like to have more help are:
  ○ Engagement of some more software projects and development of a project template
  ○ Migration of software catalog and knowledge base to a new system ensuring sustainability and completeness
● Please join and contribute to any of the working groups, the startup team, discussion fora
  ○ subscribe to the fora to follow progress and contribute