HEP Software Foundation (HSF)
What has been done so far

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for the HSF Startup Team

Jan 20-21 2015
HEP Software Foundation Workshop

The HEP Software Foundation

- **Goal: Facilitate coordination and common efforts in HEP software and computing**
- Motivated by:
  - 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

History

- Initial Workshop: 3-4 April 2014 at CERN
- **10 White Papers** with the ideas for scope, goals, formation process, governing models, etc.
- **Interim Foundation Board (iFB)**
  - Formed by WP authors and other interested people
  - Started meeting from mid July
  - Favored a **bottom-up approach**: invite projects to join (‘endorsed’ and ‘hosted’), produce specific proposals on services and eventually agree on a governance strategy
  - Decided to **assemble a startup team** of volunteers with a broad representation and expertise interested in getting the HSF started

Startup Team Membership Today

Amber Boehnlein (SLAC)

Peter Elmer (Princeton)

Daniel Elvira (FNAL)

Frank Gaede (DESY)

Michel Jouvin (LAL, IN2P3)

Pere Mato (CERN)

Dario Menasce (INFN)

Elizabeth Sexton-Kennedy (FNAL)

Graeme Stewart (Glasgow)

Craig Tull (LBNL)

Andrea Valassi (CERN)

Brett Viren (BNL)

Torre Wenaus (BNL)

Objectives of the HSF

- 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 for the community 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

Principal activities of the startup team thus far

- **Synthesizing the white papers**, other inputs, startup team views into a summary analysis and proposed initial plan
  - Released in November, updated in January
- Establishing **basic infrastructure and tools**
  - Website hepsoftwarefoundation.org
  - Mailing lists (including a HEP-wide community mailing list for broad announcements)
  - Prototypes for a software knowledge base and information exchange
- **Discussing with people across the community** how the HSF could help them, what they can bring to it
- **Planning the workshop at SLAC** Jan 20-21 to gather input to guide the HSF in its next steps
  - And a next face to face meeting at CHEP 2015 in April
- **Preparing materials to guide the input and the discussion**: prospective services, possible focus areas, questionnaire on how the HSF could be useful...

White Paper Analysis and Proposed Startup Plan

- Lays out initial ideas, proposals for building the HSF
  - The HSF will be what people bring to it; all encouraged to get involved
  - The HSF aims to marshal existing resources so they are used more effectively
- Document has twofold purpose:
  - Analyse and summarise the many proposals and ideas expressed in the White Papers
  - Take the next step beyond a bare summary: synthesise, together with other inputs, into a proposal as to how to proceed
    - Sections include, as well as a factual summary, the startup team's assessment of how the HSF should approach the area
    - Document concludes with a summary of the startup team's recommended (and partially underway) course of action
    - The plan will evolve as practical experience is gained and as a result of further discussions, in particular those at this workshop

White Paper Analysis and Proposed Startup Plan

HEP Software Foundation (HSF)
White Paper Analysis and Proposed Startup Plan

The HSF Startup Team
Version 1.1, January 7 2015

For more information see hepsoftwarefoundation.org

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The website: hepsoftwarefoundation.org

- An early objective for the HSF was to *animate discussions between all stakeholders, including users, and provide a system for facilitating information exchange*
- hepsofwarefoundation.org was established as one basis for this
- A nexus for HSF activities
- And also a prototype knowledge base and information exchange
- Objectives:
  - A communication and info exchange tool with contributions from all
  - Facilitate collaboration and common efforts, and avoid redundant efforts, by increasing awareness of the activities and resources within our field
  - Promote awareness of useful software and tools from outside our community, e.g. open source
  - Define, describe, encourage “membership in the HSF” on the part of projects
- Anyone can request an account -- you’ll be given an editor role and can add and modify content (yours and others; all changes versioned and revertible in a wiki-like way). Add your favorite software and experiment, describe the software your experiment uses

Mailing lists

- HSF Forum (the open list, self-defined ‘IFB’)
  - http://groups.google.com/d/forum/hep-sf-forum
  - 84 people (send invitation to all members precursor list)
  - Feel free to sign up
- HEP S&C community website
  - http://groups.google.com/d/forum/hep-sw-comp
  - ~175 people have signed up, ie a long way to go to be a true community list: please help propagate the word
  - And please sign up yourself!
- It is easy to sign up to the lists, no need for Google account or email address
  - Simply send mail with ‘subscribe’ as the *subject* (not content) to <listname>+subscribe@googlegroups.com, e. g. for the list above, hep-sw-comp+subscribe@googlegroups.com

Contacts

- Discussing with people across the community to introduce the HSF and collect their inputs
- One on one contacts, small discussions, presentations (have been a principal activity
- These discussions often involve correcting mistaken impressions!
- Some common examples:
  - HSF is concerned only with big players (no!)
  - High barrier to entry, like requirements on packaging, software process (no!)

Contacts thus far

- Generators/theory: January 13th
- ATLAS
- CMS
- Linear collider
- LHCb
- ALICE: January 12th
- Intensity frontier: January 8th
- Fermilab experts: January 9th
- Astro: post-workshop (Thu 22nd)
- Belle II
- Photon science: face to face post-workshop (Thu 22nd)
- Nuclear (beyond ALICE): later, not in first round
- Geant4: face to face on Thu 22nd

Workshop Goals

Main goal: Refine next steps for building HSF

- Status of the startup, white paper synthesis: where we're at now
- Hear from a range of large and small projects expressing their views on how the HSF could be useful to them, and what they can bring to it
- Hear also from experiments, science communities, individual users
- Discuss new project initiatives which might be launched under the Foundation umbrella
- Hear the views of institutions and funding agencies
- Come to consensus and conclusions on the next steps in starting up the HSF

Focus areas for HSF

What do you think should be the main areas of focus?

- Evolving software to optimize performance
- Promoting compatibility, interoperability and integration testing
- Promoting common software developments
  - A place where people can bring their ideas and projects and turn them into common efforts
- Improving communication and expertise sharing within HEP and with non HEP partners
- Support for software careers and on training
- Incubating and promoting innovation
- Others?

Potential activities/services the HSF could offer

Which of these could be useful to you as HSF activities/services? Have we missed others?

- Project hosting infrastructure
  - code repository, issue tracker, web site, etc.
- Building and testing infrastructure
  - continuous testing and integration on many different platforms and compiler combinations (e.g. Genser at LHC)
- Teams for certification and integration
  - teams helping port to new compilers, integration, certification and validation
- Software repositories and package managers
  - delivering packages with dependencies (binary or sources) in a easy way (e.g. APT, Homebrew)
- Access to computing resources on many platforms and architectures
  - new or non-standard hardware for testing and developing

Potential activities/services the HSF could offer (2)

- Access to software development tools
  - licenced tools (e.g. coverity), HEP-wide agreements
- Training in software technologies and tools
  - coordinating and organizing HEP-wide training
- Support for IP and licensing issues
  - recommended licences, access to juridic service, etc.
- Peer reviews
  - common pool of experts to review projects and experiments
- Access to scientific software journals
  - e.g. creation of a HEP S&C open access journal
- Task forces or “SWAT” teams to solve specific issues
  - experts helping on concrete problems for limited time
- Consultancy for new experiments or projects
  - helping new experiments to make the right choices