Hep Software Foundation and Community White Paper

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Terascale Annual Meeting, 22.11.16
Outline

- Motivation
- HSF Overview
- HSF Activities
- Participating in HSF
- Community White Paper (CWP)
- Summary and Outlook
Motivation

- much of the HEP software is more than 20 years old and needs to be adapted to
  - more modern software standards (c++11/c++14)
  - parallel and heterogeneous hardware architectures
  - be more efficient for coping with experiments' needs
  - need to be able to 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
- opportunity for sharing software between different experimental programs
  - do not re-invent the wheel all the time

Hep Software Foundation (HSF) has been created to address these issues
Objectives and Activities of HSF

Objectives

- catalyze new **common projects** and promote collaboration (*limited resources*)
- provide a framework for attracting effort and support to common S&C projects (*new resources*)
- provide a structure to set **priorities and goals** for the work
- support the **career development** for software and computing specialists

selected Activities

- working groups
- discussion fora
- technical notes
- knowledge base (http://www.hepsoftware.org/)
<table>
<thead>
<tr>
<th>Date</th>
<th>Meeting</th>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>Jan 2015</td>
<td>HSF Workshop (SLAC)</td>
<td>First formative HSF workshop. Refined the continuous building process of the HSF.</td>
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<td>Apr 2015</td>
<td>HSF Meeting at CHEP 2015 (Okinawa)</td>
<td>Presentation of HSF to CHEP audience. Concrete discussions about next steps in work packages.</td>
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<tr>
<td>May 2015</td>
<td>HSF Workshop (LAL, Orsay)</td>
<td>Discussion on progress an further plans. First discussion on CWP.</td>
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<td>Oct 2016</td>
<td>HSF-CWP Meeting at CHEP (San Francisco)</td>
<td>Dedicated Meeting initiating the CWP process.</td>
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Open to everybody
Anyone willing to participate and contribute is most welcome
startup team holds open weekly meetings
announced in hep-sf-forum
to subscribe send mail to:
hep-sf-forum+subscribe@googlegroups.com
so far little contribution from German community!
HSF Web site

http://hepsoftwarefoundation.org/
your entry point to all HSF activities
<table>
<thead>
<tr>
<th>Working Group</th>
<th>Objectives</th>
<th>Goggle forum:</th>
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<tbody>
<tr>
<td>Communication and Information Exchange</td>
<td>Address communication issues and building the knowledge base. Technical notes.</td>
<td>hep-sf-tech-forum</td>
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<tr>
<td>Training</td>
<td>Organization of training and education, learning from similar initiatives.</td>
<td>hep-sf-training-wg</td>
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<tr>
<td>Software Packaging</td>
<td>Package building and deployment, runtime and virtual environments.</td>
<td>hep-sf-packaging-wg</td>
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<tr>
<td>Software Licensing</td>
<td>Recommendation for HSF licence(s).</td>
<td>hep-sf-tech-forum</td>
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<tr>
<td>Software Projects</td>
<td>Define incubator and other project membership or association levels.</td>
<td>hep-sf-tech-forum</td>
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<tr>
<td></td>
<td>Easy-start project templates.</td>
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<tr>
<td>Development tools and services</td>
<td>Access to build, test, integration services and development tools.</td>
<td>hep-sf-tech-forum</td>
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HSF Topical Fora

- Software Technology Forum
  - replaced *Concurrency Forum*
  - discuss all sorts of technical issues including concurrency in our software

- Reconstruction Algorithm Forum / Common Tracking Software Forum
  - all matters of (track) reconstruction and pattern recognition software
  - 3 meetings so far (one at “Connecting the Dots” workshop)

- Machine Learning Forum
  - ML discussions and code development in the context of HEP
  - development of relevant tools, methodology and applications
- HSF Technical Notes can be proposals, ideas, whatever people want to publish and share
- existing TNs (more to come):

<table>
<thead>
<tr>
<th>TN Number</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSF-TN-2016-04</td>
<td>Vacuum Platform</td>
<td>A. McNab</td>
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<tr>
<td>HSF-TN-2016-02</td>
<td>Machine/Job Features</td>
<td>M. Alef et al.</td>
</tr>
<tr>
<td>HSF-TN-2016-01</td>
<td>Software License Agreements HSF Policy Guidelines</td>
<td>J. Harvey et al.</td>
</tr>
<tr>
<td>HSF-TN-2015-01</td>
<td>HSF Technical Notes policy</td>
<td>A. McNab</td>
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</tbody>
</table>
first discussions on CWP process started at HSF Workshop 2015 and continued at WLCG meeting at CHEP 2015

the planned outcome is to create:

A Roadmap for HEP Software and Computing R&D for the 2020s

- address the challenges in software and computing for the next 10 years
- LHC (HEP) computing models will have to change
- need a white community white paper describing the strategy and Roadmap
- LHC experiments have been officially charged by WLCG
- other HEP experiments are invited to participate
- timeline: have consensus document by summer 2017 (!)
CWP Working Groups

- **active groups:**
  - Computing Models, Facilities, and Distributed Computing
  - Detector Simulation
  - Event Reconstruction
  - Visualization
  - Data Access and Management
  - Security and Access Control
  - Machine Learning
  - Conditions Database
  - Event Processing Frameworks
  - Monitoring

- **planned groups:**
  - Triggering
  - Workflow and Resource Management
  - Physics Generators
  - Data Analysis and Interpretation
  - Data and Software Preservation
  - Software Development, Deployment and Validation/Verification
  - Careers, Staffing and Training
  - Math Libraries
  - Various Aspects of Technical Evolution
Getting involved in CWP

- details at http://hepsoftwarefoundation.org/cwp.html
- documents have been setup in Google docs for all CWP working groups
- everyone can contribute by editing these documents
- need to register (with google account):
  - mailto: hsf-community-white-paper+subscribe@googlegroups.com
- you can also start new working groups if needed
- participate in next HSF workshop (next slide)
San Diego Supercomputing Center (SDSC), Jan 23-26, 2017
main focus of workshop on CWP
plenary sessions on CWP
topical parallel working groups
your chance to get involved

http://indico.cern.ch/event/570249/overview
Summary and Outlook

HSF
- promote common SW&C projects
- foster cross experiment collaboration
- provide a structure to set priorities and goals

CWP
- define roadmap for HEP Software and Computing R&D for the 2020s
- open process with many working groups
- goal to have consensus document in summer 2017

Get Involved
- sign up for HSF and CWP mailing lists
- attend HSF meetings and workshops