· Collaborative tools and projects Commercial Concurrency Concurrent I/O · CPU and co-processor architectures • Data mining and analytics Data preservation Data storage and access · Data structures and algorithms Databases Detector geometry description Detector simulation · Development and integration Build management Code management Development environment tools Packaging and distribution Testing tools and frameworks · Distributed software Data management systems Grid middleware Networking Workload management systems

Analysis tools

· Calibration and alignment

Building a HEP software knowledge base

Torre Wenaus (BNL) Brett Viren (BNL)

Jan 21, 2015

 User HSF Workshop, SLAC

 Environment Management Virtualization and clouds

Documentation

Event generators

Event display

High performance

Infrastructure and

operating systems

Processing frameworks

Software performance and

Software sustainability

computing

Languages

Monitoring

Open source

validation

Statistical tools

Trigger/DAQ

!Chaos

Reconstruction

Software design

Geometry Visualization

Graphics

Web

Web based tools and

• Web app frameworks 1

services

HEP S&C Knowledge Base

- Proposition: HEP S&C should have a grass roots information gathering and exchange hub
 - Facilitate collaboration by increasing awareness of resources, projects, activities
 - Provide a place to look for solutions, learn from the choices made by others
 - Promote awareness of software and tools from outside our community, e.g.
 open source
- The HSF process agreed: Number one on the task list was: "provide a system for facilitating information exchange"
 - Also "Animate discussions between all stakeholders" (and here we are)
 - There are other important elements also, like expert consultants
- Must be grass roots to succeed built and maintained by the community
- HSF website hepsoftwarefoundation.org hosts the beginnings of such a system (two, even)

hepsoftware.org (TW 7/2014) Django, xml, mysql

Welcome The HEP Software Foundation Advancing high energy physics community software

HEPsoftware.org aspires to become a grass ro software and computing community. (The score also!)

Goals

Drupal

- · Facilitate collaboration by increasing awarer
- · Make this site a honey pot for contributions and technical experts directly in creating an
- Add a grass roots element to the more form wide HEP Software Foundation seeded by (created by the DOE in the US.
- Promote awareness and use of open source computing community.

HSF website (TW 10/2014)

The one in production that we

If we migrate to a new version,

we'll migrate the data as well

ask you to contribute to!

High intensity, neutrino

Documents Events Organization Plan Needs Startup team Site development Google

T2K Submitted by costas and reopoulos on Wed. 2015-01-07 07:12

Tokai to Kamioka (T2K) long-baseline neutrino oscillation experiment

· Adding/editing content Science field: High intensity, neutring

HSF website

Content summary

Recently added

HSF what's new

1/7 guidelines & questions

11/28 How to add content

Jan 2015 SLAC workshop

Join the HEP S&C list!

1/7 HSF iFB meeting 1/7 Startup document 1.1

Wiki

Q

GENIE

Submitted by costas.andreopoulos on Wed, 2015-01-07 06:37 GENIE is a popular neutrino Monte Carlo event generator used by almost all accelerator

It provides a bridge between theory and experiment and it plays an important role through every experiment, from design and optimization till the final physics publication.

Software catalog

Software list Software by category

artdag

Submitted by jbkowalkowski on Mon, 2015-01-05 16:14

artdaq is a data acquisition toolkit for particle physics experiments. It provides core fu commonly used in DAQ systems, and it provides a framework for experimenters to build components that are unique to their experiment

LArSoft

Submitted by wenaus on Thu. 2014-10-23 18:36 Historical Context

LArIAT

Submitted by wenaus on Thu, 2014-10-23 18:25

LArTPC in a testbeam; develop particle ID & reconstruction.

Prototyping since last summer



Main page

Recent changes Random page

Categories Software

> Experiments Programming

languages

▼ Tools What links here Related changes Special pages Printable version Permanent link Page information

Browse properties

Category:Software

wiki.hepsoftwarefoundation.org/wiki/Category:Software

This category uses the form Software.

Subcategories

Category Discussion

This category has the following 6 subcategories, out of 6 total.

A

Analysis tools

D

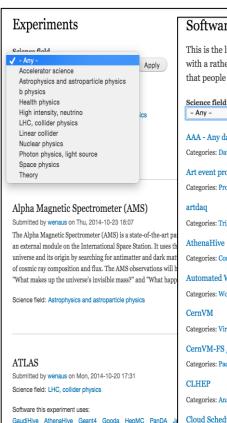
Detector simulation

HSF wiki (BV 12/2014)

Semantic MediaWiki

In development

- Software Framework
- Software Toolkit



Belle II

Submitted by wenaus on Thu, 2014-10-23 18:19

The Belle II detector is a general purpose spectrometer for the n The Belle II efficiently collects data of e+-e- collisions made by

Research focus: Heavy flavor physics, CP asymmetries, new ma

Science field: b physics

BES III

Submitted by wenaus on Thu, 2014-10-23 18:20

Research focus: Precision measurements charm, charmonium,

IHEP, Beijing, China.

Science field: High intensity, neutrino

Software entries

This is the list of entries describing software that are with a rather random collection of software entries that people take over and improve existing entries,

Apply

AAA - Any data, Anytime, Anywhere

Categories: Data management systems

Art event processing framework

Categories: Processing frameworks Science fields: High intensity

Categories: Trigger/DAO Science fields: High intensity, neutrino

Categories: Concurrency, Processing frameworks

Automated Workflow Engine (Pipeline)

Categories: Workload management systems Science fields: Astro

Categories: Virtualization and clouds

CernVM-FS / cvmfs

Categories: Packaging and distribution, Grid middleware, Virtuali

Categories: Analysis tools, Statistical tools

Cloud Scheduler

Categories: Virtualization and clouds

Categories: Concurrency, CPU and co-processor architectures, Op

Fabric For Frontier Experiments (FIFE)

Categories: Processing frameworks Science fields: High intensity

Categories: Data management systems

Categories: Processing frameworks

Categories: Concurrency, Processing frameworks

Categories: Detector simulation Science fields: Accelerator science physics, Health physics, High intensity, neutrino, LHC, collider ph source, Space physics

Categories: Detector geometry description

Organizations

ATLAS Future Software Technology Forum (FSTF)

Submitted by wenaus on Mon. 2014-10-20 21:33

Goals of the ATLAS Future Software Technology Forum (FSTF):

- · Collect and exchange experience from various groups within ATLAS who are investigating new software
- · Create a knowledge pool.
- · Improve communication within developer communities.
- · Improve exchange with other experiments.

Read more

Concurrency Forum

Submitted by wenaus on Mon, 2014-10-20 22:18

Software engineering is moving towards a paradigm shift in order to accommodate new CPU architectures with many cores, in which concurrency will play a more fundamental role in programming languages and libraries. HEP software will also need to accommodate the new hardware architectures by introducing parallelism whenever possible in order to make efficient use of all the available cores.

Distributed ROOT I/O working group

Submitted by wenaus on Tue, 2014-10-21 10:43

Cross-domain working group to improve ROOT I/O performance in deployed, distributed environments, with particular but not exclusive attention to analysis use cases.

Read more

HEPiX - The High Energy Physics Unix Information Exchange

Submitted by wenaus on Thu, 2014-10-23 18:30

The HEPiX forum brings together worldwide Information Technology staff, including system administrators, system engineers, and managers from the High Energy Physics and Nuclear Physics laboratories and institutes, to foster a learning and sharing experience between sites facing scientific computing and data challenges. Participating sites include BNL, CERN, DESY, FNAL, IHEP, IN2P3, INFN, JLAB, NIKHEF, RAL, SLAC, TRIUMF and many others.

Read more

Open Science Grid (OSG)

Submitted by wenaus on Mon, 2014-10-20 18:04

A community of scientists, researchers, and experts in high throughput computing, based in the US and extending around the world. The OSG represents US LHC and the US LHC cyberinfrastructure in WLCG.

Production services for operation of access to heterogeneous resources across the US - 5 US labs and over 100 universities:

US DOE HEP Forum for Computational Excellence (FCE)

Submitted by wenaus on Thu, 2014-10-23 18:32

What's in it?

Software

- By science field
- By category
- Experiments using it
- Other software using it
- Related software

Experiments

- By science field
- The software they use

Organizations

- Involved in HFP S&C
- Common projects

Institutions, facilities

Scoped to S&C, initial emphasis on software

To come

Project proposals

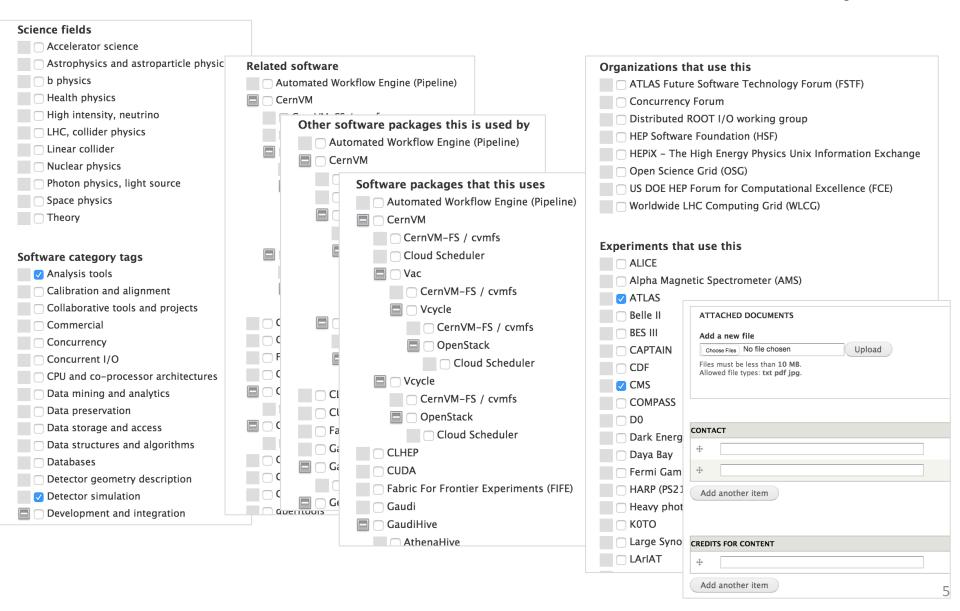
New collaborative opportunities

Job listings

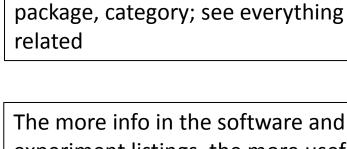
Licensing info, guidance

... your ideas

Add software, add its relationships



Search Search by experiment, software Enter your keywords related Advanced search Search results ATLAS Future Software Technology Forum (FSTF) Goals of the ATLAS Future Software Technology Forum (FSTF): Collect and exchange experience from various experiment listings, the more useful groups within ATLAS who are investigating new software technologies. Create a knowledge ...



to search, navigate, discover...

GaudiHive AthenaHive Geant4 Gooda HepMC

Analysis tools Detector simulation Event display Rec

ROOT Framework meetings, CERN SFT group

Pere Mato (CERN), ROOT team leader

Software this experiment uses:

Science field:

Links:

Website

Twitter

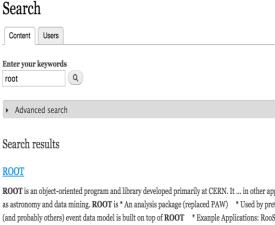
ATLAS CMS

Contact:

LHC, collider physics

Software category tags:

Experiments that use this:







... Software packages that this uses: ROOT Other software packages this is used by: LArSoft ...

t event processing framework	

HSF - Software - wenaus -	2014-12-01	11:09 - 0	comments

ALICE

HSF - Experiment - wenaus - 2014-10-23 17:54 - 0 comments

ATLAS

... Gooda HepMC PanDA Jenkins ROOT XRootD FAX Links: Collaboration website ... HSF - Experiment - wenaus - 2014-10-23 17:44 - 0 comments

... this experiment uses: GaudiHive Geant4 ROOT Links: Website ...

... physics Software this experiment uses: ROOT Links: Website ...

LHCb

HSF - Experiment - wenaus - 2014-10-23 17:51 - 0 comments

ATLAS

Science field: LHC, collider physics Software this experiment uses: GaudiHive AthenaHive Geant4 Gooda HepMC PanDA Jenkins ROOT XRootD FAX Links: ...

HSF - Experiment - wenaus - 2014-10-23 17:44 - 0 comments

HSF - Organization - wenaus - 2014-10-20 21:35 - 0 comments

AthenaHive

ATLAS Athena variant of GaudiHive Software category tags: ... GaudiHive Experiments that use this: ATLAS Contact: Paolo Calafiura (LBNL) ...

HSF - Software - wenaus - 2014-10-20 21:46 - 0 comments

ROOT

... building (CERNLIB on steroids) * For example, the ATLAS (and probably others) event data model is built on top of ROOT * ... Twitter Experiments that use this: ATLAS CMS Contact: Pere Mato (CERN), ROOT team leader ...

HSF - Software - wenaus - 2014-10-20 21:18 - 0 comments

FAX

... system based on xrootd, designed to * Create a common ATLAS namespace across all storage sites, accessible from anywhere * ... XRootD Experiments that use this: ATLAS Contact: Rob Gardner (U Chicago)

HSF - Software - wenaus - 2014-10-20 21:31 - 0 comments

CernVM

... website Experiments that use this: ATLAS CMS LHCb ...

GENIE

Software categories

- Analysis tools
- · Calibration and alignment · Collaborative tools and
- Commercial
- Concurrent I/O
- · CPU and co-processor
- · Data mining and analytics
- Data preservation
- Data storage and access
- · Data structures and
- Databases
- · Detector geometry description
- Detector simulation
- Development and integration
- Build management

- · Packaging and distribution
- · Testing tools and frameworks
- Distributed software

- Networking
- · Workload management
- Documentation
- · Event generators
- Graphics · Event display
- Geometry Visualization
- computing
- Infrastructure and operating systems
- Languages
- Open source Processing frameworks
- Reconstruction · Software design
- · Software performance and validation
- Software sustainability
- Statistical tools
- Trigger/DAQ

Environment

- !Chaos
- Management · Virtualization and clouds
- · Web based tools and
- · Web app frameworks

Look interesting? Ways you can help

- Add, correct, extend info at hepsoftwarefoundation.org
 - All hepsoftwarefoundation.org account holders have edit rights
 - Add your favorite software, add links to info and docs, show who uses it, what other software does it use, who to contact...
 - Add your favorite experiment, improve its entry, declare what software it uses, who to contact...
 - Add HEP S&C events of interest
- Give us your ideas
- Help us develop it!

HEP Software and Computing Events

Conferences, workshops, meetings, schools, tutorials etc. Feel free to add events of community interest, past or future. All events appear in the calendar.

\$



The CHEP 2015 organizers have kindly agreed to include in the Conference planning a HEP Software Foundation meeting early Friday afternoon Apr 17, just after the conclusion of the Conference. Time and details are to be determined, but with very many flights to Tokyo available in the late Friday afternoon and evening we