

Update on Experiment Software

FCC-hh detector meeting

March 7, 2017
Joschka Lingemann
EP-SFT - CERN

Working with your Laptop on FCC

We want to support standalone analysis:

- Similar to CMS “Framework Light”
- Currently two packages
 - FCC-Physics: Pythia interface
 - HEPPY: Python-based analysis framework
- The glue to make things work together: Event Data Model

Need to install and manage dependencies correctly:

HepMC - Pythia - FastJet - PODIO - FCC-EDM - FCC-Physics - HEPPY

Want to simplify the setup for users!

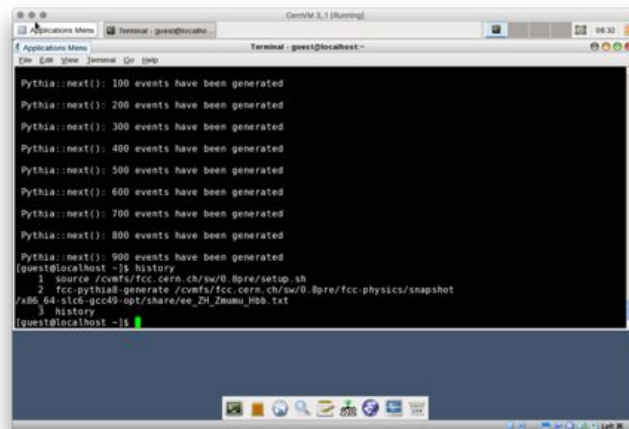
Using CERN Virtual Machine

Small CernVM image

- Contains CVMFS (distributed file system)
- Also provides our software (use setup script)
- CVMFS needs internet connection

User Workflow:

1. Install VirtualBox (or other hypervisor)
2. Add CernVM image
3. Pair image with our CernVM description
4. Work in Virtual Machine

A screenshot of a terminal window titled 'CernVM 3.1 (Running)'. The terminal shows a series of messages from 'Pythia' indicating the number of events generated, ranging from 100 to 900. At the bottom, a user prompt shows the user running 'history' and listing the contents of a file named 'ee_zh_zmumu_hbb.txt'. The file contains two lines of shell commands: 'source /cvmfs/fcc.cern.ch/sw/0.8pre/setup.sh' and 'fcc-pythia8-generate /cvmfs/fcc.cern.ch/sw/0.8pre/fcc-physics/snapshot'.

```
Pythia:next(): 100 events have been generated
Pythia:next(): 200 events have been generated
Pythia:next(): 300 events have been generated
Pythia:next(): 400 events have been generated
Pythia:next(): 500 events have been generated
Pythia:next(): 600 events have been generated
Pythia:next(): 700 events have been generated
Pythia:next(): 800 events have been generated
Pythia:next(): 900 events have been generated
[guest@localhost ~]$ history
 1 source /cvmfs/fcc.cern.ch/sw/0.8pre/setup.sh
 2 fcc-pythia8-generate /cvmfs/fcc.cern.ch/sw/0.8pre/fcc-physics/snapshot
 3 history
[guest@localhost ~]$
```

Can we simplify more?

Using FCC Docker images

Software containers: Package and deploy applications

- Docker is de-facto standard
- Image based on ubuntu
- Contains all necessary software

User workflow:

1. Install Docker
2. Load FCC image
3. Work with your native tools

```
joschka@mbp $ docker load -i ubuntu16.04_root6.08.02_fcc0.8.tgz
joschka@mbp $ docker run -ti --name fccsw --rm fccimage
+-----+
                FCC  ##                .
                ## ## ##                ==   Welcome to the FCC software doc
                ## ## ## ##            ===   REMINDER: Containers are dispos
                /"////////////////////\___/  ===           Keep your data in vol
~{~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ /  =====~
  \_____o_____ \___/  ___/
   \_____ \_____ \___/  ___/
+-----+
fccuser@ee0dc3be57e4:~$ fcc-pythia8-generate $FCCBASE/share/hh_
```

[More information](#)

Feedback welcome.

Other activities (partly covered in other talks)

Reconstruction software progressing:

- Calorimetry - towards combined ECal + HCal reco
- Tracking - track event data model finalised
first FCCSW integration of ACTS being finalised

Re-organising our EOS space:

- With more users, now properly structuring the space
- New [e-groups](#) to manage write access rights:
 - **fcc-eos-access-user**: default user quota is 100 GB with 10 k files
(seeded from previous fcc-eos-access [which now is for admins only])
 - **fcc-eos-access-hh**: larger quota for shared samples, upper limit 50 TB
(only if you want to generate general purpose samples)

AFS phase out

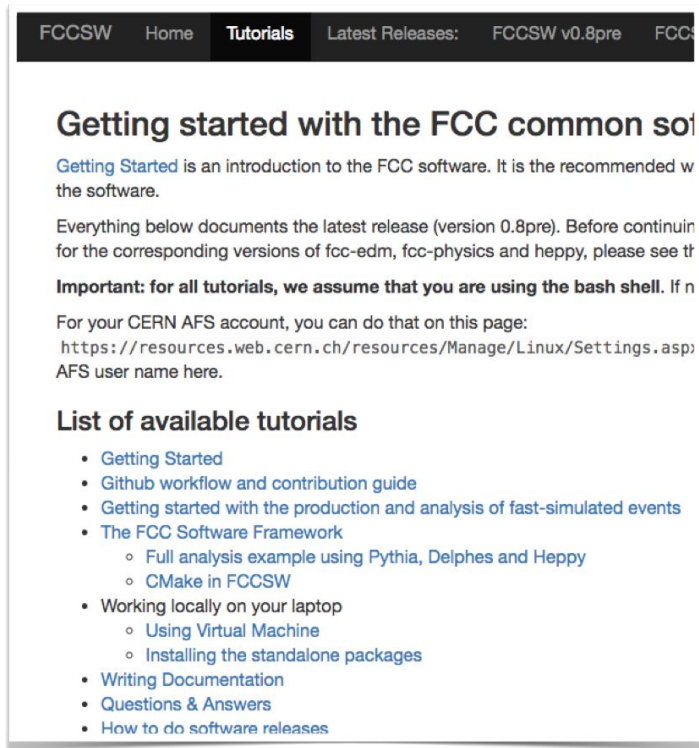
AFS is being deprecated

- Projects are encouraged to move as soon as possible
- FCC software is switching to
 - EOS for services
 - CVMFS as primary way to distribute our software

Recently made the switch to CVMFS: Nothing *should* change for the users

- Let us know if you encounter any problems

Updated Documentation & Issue Tracker



The screenshot shows a web page with a dark navigation bar at the top containing links for 'FCCSW', 'Home', 'Tutorials', 'Latest Releases:', 'FCCSW v0.8pre', and 'FCCSW'. The main content area has a heading 'Getting started with the FCC common software'. Below the heading, there is a paragraph introducing 'Getting Started' as an introduction to the FCC software. Another paragraph explains that the content documents the latest release (version 0.8pre) and refers to other versions of fcc-edm, fcc-physics, and heppy. An important note states that all tutorials assume the use of the bash shell. A link is provided for CERN AFS account settings. A section titled 'List of available tutorials' contains a bulleted list of links: 'Getting Started', 'Github workflow and contribution guide', 'Getting started with the production and analysis of fast-simulated events', 'The FCC Software Framework' (with sub-links for 'Full analysis example using Pythia, Delphes and Heppy' and 'CMake in FCCSW'), 'Working locally on your laptop' (with sub-links for 'Using Virtual Machine' and 'Installing the standalone packages'), 'Writing Documentation', 'Questions & Answers', and 'How to do software releases'.

Web-page with all info: fccsw.web.cern.ch

A growing list of [tutorials](#):

- VM (and Docker)
- Delphes + Analysis
- Adding detector description
- Run full simulation
- And more...

Moved to [GitHub issue tracker](#):

Let us know if you encounter problems

Summary

Simulation is now in a steady maintenance state

Focus switched to reconstruction (progressing)

Virtual Machine and Docker allow to run standalone analysis

- Easy setup for users
- Software regularly updated by us

EOS space to support analyses (feedback regarding quota?)