HSF 18 Visualization Summary

Joint projects, Demonstrators, Next Steps

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Joint WLCG & HSF Workshop 2018
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Napoli, Italy

Key points

At our **first topical Workshop**, last year

- http://hepsoftwarefoundation.org/events/2017/03/28/VisualizationWorkshop.html
- https://indico.cern.ch/event/617054/

we shaped the **CWP content** and we agreed on some **key points**:

- We should foster **shared development**, to search **common solutions for common problems**
- We should not try to develop “one software to rule them all”, because, even if we share a lot, all experiments have their own peculiarities
- instead, we should **share best practices** and develop “**sharable base packages**”: not complete applications, but **small modular bits** which could be used as the base to build experiment’s specific applications. Those “base packages” should be **developed as joint projects** between the experiments

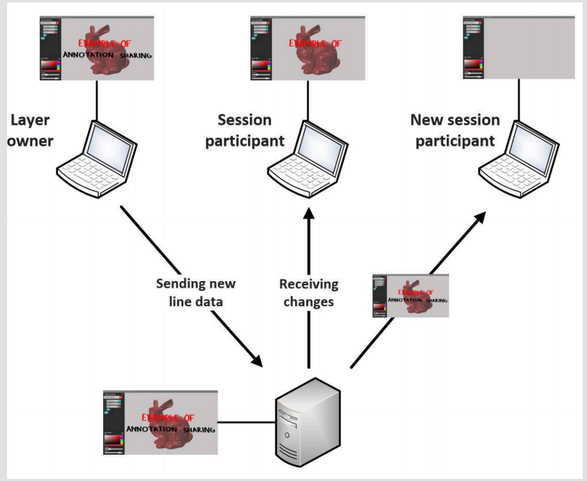
HSF 18 Visualisation session - I

In the perspective of **building collaborations** and **sharing solutions**, we had a rich agenda on **“common” or “sharable” projects**:

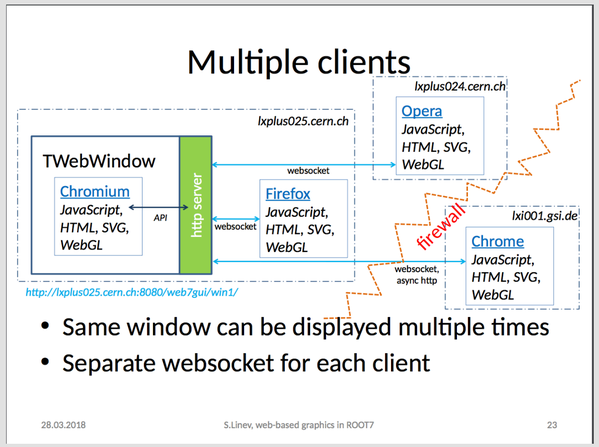
- **Ciril Bokah** (Ljubljana), expert of **3D graphics for medical applications**, talked about client-server visualisation, hybrid rendering and collaborative visualisation, in the context of a **new ATLAS/CMS/Ljubljana joint project**

  Note**: Ljubljana is **not a HEP-Institute**, this is a collaboration aimed at **exchanging expertise** and best practices **with other research fields

- **Sergey Linev** (GSI), developer of the **JSROOT** and ROOT graphics packages, talked about the recent developments made within a **CMS/ROOT/GSI joint project** about new techniques of client-server visualization, JSROOT interfaces, WebEngines



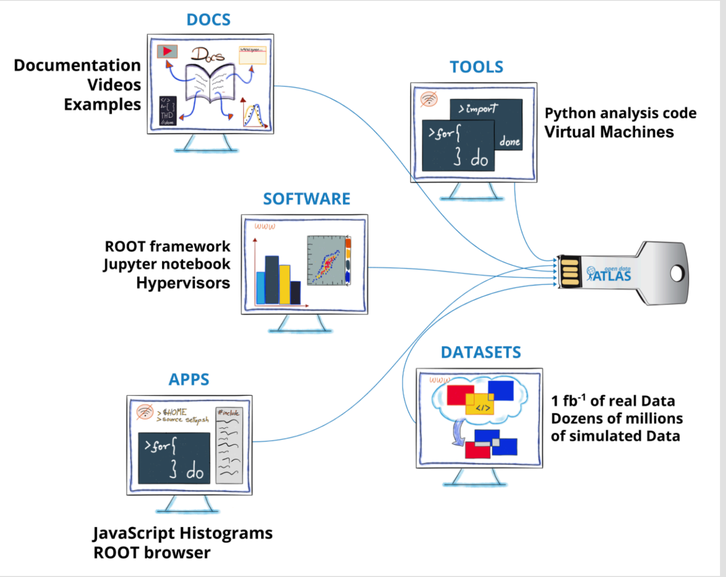
collaborative visualization C.Bohak



client-server visualization S.Linev

HSF 18 Visualisation session - II

- **Arturo Sanchez Pineda** (ATLAS) reported on recent developments on using the "Electron" framework to build **interactive rich web applications** running ROOT code and 3D graphics, **used worldwide for Masterclasses** and for other **educational projects** using the ATLAS **Open Data**



A.Pineda

- **Leo Piilonen** (Belle II) presented a thorough presentation on the development of their **VR application**. Among many interesting points, was very interesting to see **how Belle II exported their Geant4-based geometry** into two 3D exchange formats (FBX, VRML2)

During Q&A, **Ric Bianchi** and **Ed Moyse** (ATLAS) asked Leo about the process and the tools that were used. Just after his talk, **Leo extracted the exporters' code from the Belle II framework** and provided us with the code…
…de facto **giving birth to a new Belle II/ATLAS joint project!!**
Thanks, Leo!

Geometry (2)

Export the Belle II detector geometry from basf2 framework

- ✓ all detector elements are rendered as polygons of the surface before exporting, using GEANT4's GetPolygon()
- ✓ GEANT4 accepts a UI command to write its polygonized geometry to various formats (HepRep, DAWN, VRML, VRML2) – only VRML2 would be viable here. *But this barfs on parts of our geometry, and the output file is unstructured.*
- ✓ **write two new basf2 modules to export to VRML2 or FBX**
  - geometry/modules/vrmlWriter
  - geometry/modules/fbxWriter

  } ⇢ *structured text files*
  - can export geom subset via python-steering parameter
  - examine the geometry using FBX Review, for example (www.autodesk.com/products/fbx/fbx-review)
  - Unity can import FBX files directly *(VRML2 via translator)*

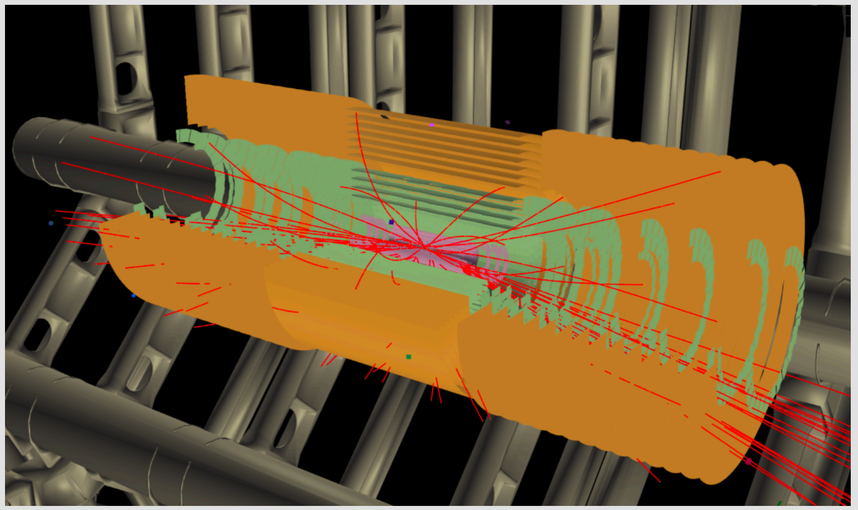
L.Piilonen

This is all in the HSF spirit *(E.Moyse)***:**
for common problems, common solutions!

WG Demonstrators

- After the session, Ed Moyse (ATLAS), pushed **a new demonstrator** into our GitHub repo:

  WED-WebEventDisplay - A lightweight solution for web-based event displays



- The HSF Visualisation WG has **2 contributed demonstrators**, **already**!

https://github.com/HSF/Visualization

Common data exchange format

- We started discussing about a **common exchange event data format**, the key ingredient of any sort of "common/shared development"

Base common structure

+

a part expandable by the experiments to add custom info

- Discussions ongoing about JSON, JSROOT, data content
- First **demonstrators** soon

CWP & Workshop

- CWP status: **Tom McCauley** (CMS) did some editing recently (3 passes, already!) and it is mostly well-shaped, now.
  Now we asked for **the help of the WG**:
  - https://github.com/HSF/Visualization/tree/master/documents/CWP

- We launched the idea of **a second topical workshop**, for groups to report on common projects. Perhaps, **in Autumn**…