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TRevolution.js

Submitted by axel on Wed, 09/11/2011 - 22:04

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Hi,

One of ROOT's traditional features: you can use it on any platform. That was especially true in the past: Linux, Windows, MacOS, Solaris, AIX, HP/UX - you name it: ROOT was there. But now we have a different environment: devices are getting smaller, and next to good old Linux and Windows in new cloths (Android, Windows Mobile) we have new, dedicated mobile OSes like iOS.

Is that mobile world relevant to ROOT? Yes, because ROOT consists of two parts: the number crunching and storage - that didn't change too much - and the interactive part: experiments use ROOT histograms for online quality control, PROOF and any other well-designed compute "farming" solution reports back with live histograms.

So what would it take? We could implement an iOS, an Android, and a Windows Mobile port of ROOT. Timur and Fons have [done the port to iOS](#) [5], a student down my corridor, Jakob Blomer, once showed that a port to Android also works. The main challenges are the GUI / windowing systems, as well as the distribution of the ROOT port onto these devices. The Android port is incomplete on the graphics part, the iOS one on the distribution part. (Just because you own an iPhone doesn't mean Apple allows you to do with it what *you* want. There's a good reason for it, though: Apple knows that that's better for you.) And both iOS and Android ports are too heavy for the most common use case: looking at histograms stored in ROOT files on a web server.

The obvious solution sounded demanding: implement ROOT's I/O in JavaScript, and pipe the data into one out of many possible JavaScript visualization libraries. While for iOS and Android we were able to use ROOT's native C++ core including I/O, all of that would have to be re-implemented for JavaScript. And ROOT's I/O is famous for its simplicity of implementation and its massive documentation. Err, wait. ROOT's I/O is famous for being able to cope with all C++ constructs and doing that incredibly sturdy and fast. Right, *that's* what it was.

Bertrand took up that challenge and implemented a [pre-alpha prototype](#) [6] that already gives a good feeling just *how* powerful this approach is: grab the [HTML file](#) [7], the [CSS file](#) [8] and the [JavaScript file](#) [9]. Edit the HTML file to point to your ROOT file(s), put everything on a web server, and you can immediately browse the histograms the ROOT file contains, live. No ROOT installation, all JavaScript. No heavy lifting, only those bits are transferred that are needed: why download the 2GB TTree of you want to check out the histogram next to it?

I was super-impressed that Bertrand managed all that within a few weeks. That it's possible at all, actually. And how useful the result is, even if Bertrand claims it's far from being ready for public use (you have been warned! Especially the visualization part is now under active development).

I think his work will rapidly change the way the experiments do their online monitoring, the way people run analyses - check your intermediary results, live! - and possibly also the way you, our users, see ROOT: not stuck in the dark origins of C++, but creatively making use of new technologies like your cell phone. We hope you'll like it - I do.

Cheers,



Edit 2013-01-15: updated CSS and JavaScript links.

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Source URL: <http://root.cern.ch/drupal/content/trevolutionjs>

Links:

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- [5] <http://indico.cern.ch/getFile.py/access?contribId=1&resId=0&materialId=slides&confId=158034>
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