



LHC@home status BOINC at CERN

Nils Høimyr, on behalf IT/PES and the BOINC teams at CERN and the CCC

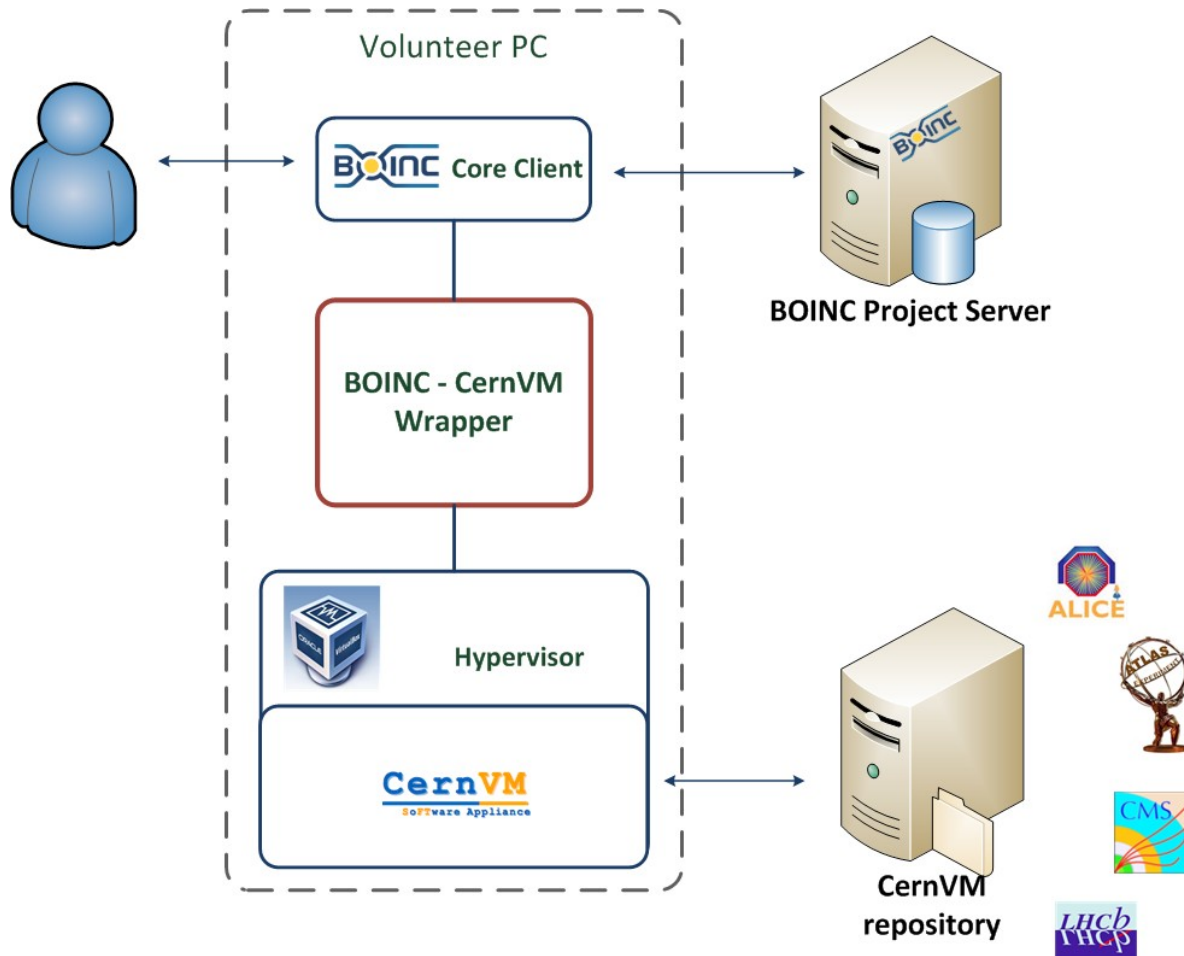


- Status of BOINC at CERN
 - [LHC@home](#) Classic - SixTrack
 - [LHC@home](#) 2.0 – Volunteer Cloud
 - BOINC CernVM architecture
 - Organisation of BOINC activities at CERN
 - CERN BOINC service outlook
 - BOINC issues/wish list

- Calculates stability of proton orbits in the LHC accelerator.
 - SixTrack Fortran program, simulating particle trajectories.
- About 100k users, 270k PC's over the years.
 - Client runs on Linux, Mac and Windows platforms.
- Started as an outreach project for CERN 50th Anniversary 2004; used for Year of Physics (Einstein Year) 2005.
 - Based on earlier experience with CPSS from 2003.
- Objectives: extra CPU power and raising public awareness of CERN and the LHC - both successfully achieved.
 - Project hosted at Queen Mary from 2007 to 2011.
- Server migrated back to CERN in September 2011.
 - Renewed effort on Sixtrack for LHC upgrade studies (HL-LHC).
 - Recently about 1k clients on virtual machines running in the CERN computer centre on Open Stack testing new infrastructure.

- Project done by Ben Segal, a number of short term students, the Citizens Cyberscience Centre and the CernVM team of PH/SFT
 - Presented last year as Beta, now in production
- Application case from the Theory group
 - Theoretical fitting of all past experimental data (including LHC) using Monte Carlo simulation based on Standard Model
- Uses a virtual machine on the volunteer computers
 - User installs Virtual Box
 - User installs the BOINC client
 - Attach to project and ready to go with application on CernVM
 - The BOINC client downloads a VM-wrapper, that gets the image and the job to run on the VM
 - Potentially wide range of physics applications

BOINC - CernVM Architecture



- BOINC infrastructure (IT Department)
 - Servers, databases and other IT infrastructure
 - BOINC application level setup and support
 - Auxiliary servers for job management (Co-Pilot, CernVmFS)
- User applications in projects (BE & PH Departments with external partners)
 - Porting of applications to BOINC
 - Processing of results
 - Contents of web pages
 - Communication with users about scientific projects



- Move from hosting 2 different projects to a generic BOINC service for multiple High Energy Physics simulations
 - Common platform based on virtualization
 - Web Portal unification and improvements

Time scale depends on demand from physics groups as well as the evolution of the BOINC software.

- Native virtualisation support by BOINC
 - Virtual Box download packaged with the BOINC client
- Security:
 - Validation of BOINC user registration email
 - Can we force SSL on BOINC projects without causing trouble for users with older BOINC clients?
- Credit improvements
 - Challenge of returning credit from jobs under VMs
 - Team synchronization
- Release policy: stable vs SVN
 - Current approach may lead to branching
 - Migrate to GIT to ease 3'rd party contributions?
 - Unit tests, integration of stable releases?

Questions?

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