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Public Resource Computing and Geant4

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Projects like SETI@home use computing resources donated by the general public for scientific purposes. Many of these projects are based on the BOINC (Berkeley Open Interface for Network Computing) software framework that makes it easier to set up new public resource computing projects. BOINC is used at CERN for the LHC@home project where more than 10000 home users donate time of their CPUs to run the Sixtrack application. The LHC@home project has recently delivered the computing power of about three Teraflops, which makes it interesting also for other applications that could accept the constraints imposed by the BOINC model that requires simple, relatively small, CPU bound programs that can run on a sandbox. Once these constraints are met, BOINC allows thousands of different instances of the programs to run in parallel. The use of Geant4 in a public resource computing project has also been studied at CERN. After contacts with developers we found that BOINC could be useful to run the GEANT4 release testing process that was found to be a good case study to explore what we could do for more complex HEP simulations. This is a simple test beam set-up to compare physics results produced by different program versions which allows validating new versions. Therefore we ported the GEANT4 release testing software to the BOINC environment both in Windows and Linux and set up a BOINC server to demonstrate a production environment. The benefits and limitations of BOINC based projects for running Geant4 are presented.

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