BRaTS@Home and BOINC Distributed Computing for Parallel Computation
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Abstract

Utilizing Internet connectivity, the Berkeley Open Infrastructure for Network Computing (BOINC) provides parallel computing power without the expense of purchasing a computer cluster. BOINC, written in C++, is an open source system, acting as an intermediary between the project server and the BOINC client on the volunteer's computer. By using the idle time of computers of volunteer participants, BOINC allows scientists to build a computer cluster at the price of one server. As an example of such computational capabilities, I have developed BRaTS@Home, standing for BRaTS Ray Trace Simulation, using the BOINC distributed computing system to perform gravitational lensing ray-tracing simulations. Though BRaTS@Home is only one of many projects, 182 users in 26 different countries participate in the project. From June 2007 to April 2008, 795 computers have connected to the project server, providing an average computing power of 1.1 billion floating point operations per second(FLOPS), while the entire BOINC system averages over 1000 teraFLOPS, as of April 2008. Preliminary results of the project's gravitational ray tracing simulations will be shown.