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BOINC

Several scientific projects based on the {\bf BOINC} (Berkeley Open Infrastructure for Network Computing) package released in 2003 are now running routinely on hundred thousands of personal PCs.

The BOINC paradigm is to make use of the CPU cycle, memory and disk space donated by public users or companies. During system idle time, a client code selected by each individual's own scientific interest can be set to run. The computing power hence provided would be limited, but when hundred thousands or millions of Pcs are ganged together, the resulting power is equivalent to several No.1 Top 500 mainframes.

The quality factor of the PDC is not as high as what one can expect from a dedicated mainframe. Due to computer failures, malicious interferences or slow networks, some computing redundancy must be built-in, resulting in a reduction of the pure expected power. Nevertheless the potential is huge and growing as shown by the {\bf SETI@Home} pioneering project which in 2004 was reporting using 1 million user computers for a sustained processing power of 70 Tflops. At this time there was roughly 300 million hosts connected to the Internet. This small fraction (0.3\%) can be certainly increased by giving the project a wider publicity and more incentives to the users. In the longer term, the number of computers in the world is expected to rise up to 1 billion by 2015 so that scavenging Pflops is not out of range.

In return each user receives credits proportional to its PC computing time and a ``hall of fame" ranking is shown on the web. But a very important motivation both for physicists and for the users is the invaluable outreach that comes with it. Through the screen-saver displaying the calculation status and web pages presenting a lively description of the science research being pursued, the user gets the feeling of becoming part of this great scientific endeavor.

Since the introduction of the open source BOINC packages, this approach has been followed by climate prediction, protein structure, gravitational wave physics researches. CERN has based on it its long term simulation of LHC beams. But many other applications can be developed in HEP that would benefit both the research needs and the public information.

-- DenisPerretGallix - 19 Oct 2005

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