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SPACE SCIENCE AND SOCIETY – MOTIVATING THE MASSES TO DONATE IDLE COMPUTING TIME AT HOME FOR NUMERICAL AEROSPACE RESEARCH IN DISTRIBUTED COMPUTING AND CITIZEN SCIENCE

Abstract

Distributed computing is a concept to generate an infrastructure of network computing capacity formed by volunteers donating idle computing time of their personal computers connected via the internet. This is used by SETI@home at University of California, Berkeley and various other projects using BOINC (Berkeley Open Infrastructure for Network Computing) for medical, biological and astronomy sciences for years.

The Constellation Platform is the first of such BOINC projects concentrating on applied aerospace and related research and gathered 2500 users with more than 5000 PCs since April 12th, 2011. As it is a community based super-computer, it is self scaling and given status is true for February 2012.

Besides the technical aspect of Constellation, the main challenge is to motivate the individual person and the community in general to join and attach his/her personal computer the project for the benefit of all, the researcher and the end-user. This is alike the IAC 2012's theme of "Space science and technology for the needs of all". And further more, as an open platform it is another task to even make the platform available for those users and their own numerical application, be it professional research, a student thesis research or citizen science project.

To motivate the users and application scientists" several techniques and reward systems can be used, starting from credit points for the most computing time donated, to virtual badges and team races and leagues or naming the user in papers and studies based on their participation and findings.

This is an additional branch to generate computing capacity for those, who have no access to high performance computing like societies, students and developing countries, and to generate grass roots space programmes, where the public can be part of with very little basic committing, but with great possibilities for more. This forms space awareness and serves for outreach of the application project and for education of the volunteer, who can learn more about what he participates in leading to a closed connection, when the volunteer becomes his/her own application scientist.

In case of universities and companies with special tailored applications for distributed computing, it also serves as public relations and bindings to the end-user, who will have deeper insights of their work and will perhaps use the results of the research in the future. So the applied motivation for those parties is different due to legal and market considerations.