BOINC Workshop 2024 Impact Report

Authors	Laurence Field
Reviewers	Arne Wiebalck
Date	09/09/2024
Revision	V1.1

Background

The Berkeley Open Infrastructure for Network Computing (BOINC) is an open-source middleware system for volunteer computing. It enables projects to build their own volunteer computing platform to run their scientific applications and provides the foundation for LHC@home, CERN's own volunteer computing project which has been running since 2004.

The BOINC community has been arranging workshops since the 1st Pan-Galactic BOINC Workshop that took place at CERN in July 2005. These workshops bring together the BOINC projects and the developers, along with representatives for the volunteers, to share experiences, discuss issues and set the future direction.

To celebrate 20 years of BOINC, it was decided to bring the workshop back to CERN. The date was chosen to coincide with other events taking place at the same time in 'Interational Geneva' such as the World Summit on the Information Society (WSIS), the Geneva Trialogue on AI and Education for the SDGs and the Space and Global Health Hackathon.

The organising committee reached out to IT-CD to help support the event by hosting the workshop at CERN. A member of the LHC@home team in IT-CD-CC accepted this challenge, joined the organising committee and help to ensure the events success.

Event Overview

The event took place overt three days and the full agenda is available on Indico.

The first day was dedicated to celebrating 20 years of BOINC; reviewing the past but also looking forward into the future.

The morning focused on the history of BOINC. David Anderson, the founder and lead developer of BOINC, started with a talk on the origins, past and future of BOINC. It provided a good overview of the journey so far, some interesting insights and outlined some of the challenges ahead. Patrick Schoefer, followed this with a historical overview from a volunteer's perspective which showed the hardware changes over the years and active projects. Matthew Blumberg, the current chair of the BOINC Project Management Board, presented the past and future of GridRepublic and Charity Engine. He showed his early vision of a sharing feature directly integrated into the Windows control panel and how his attempts to realise this lead him on the current path. Francisco Sanz talked about Empowering Science through the People and Citizen Science Infrastructures in Europe. Following this was a talk on LHC@home and the Impact of BOINC on Science giving by multiple speakers. First François Grey explained how LHC@home was conceived and its initial success spawned a number of other initiatives. Laurence Field described how LHC@home has developed from an initial prototype to a reliable production service that has delivered computing for CERN applications for 20 years. Alex Piskun followed with an explanation of his efforts to record all publications linked to BOINC projects. He highlighted that if LHC@home was an author, it would have an h-index of 23.

During this event a celebratory lunch took place in Restaurant 1 and David Anderson was presented with a birthday cake for BOINC.

The afternoon session was focused on looking towards the future. Ana Varbanescu raised the topic of Green IT with a talk on energy consumption and carbon footprint of volunteer vs data center computing. Work in this area is ongoing and it is hoped that a report or paper will

shortly be available with some conclusions. Bastien Chopard gave a talk on New opportunities for BOINC in the field of scientific simulations which suggested three possible new applications that could benefit from volunteer computing. The possibility of doing large scale deep learning using volunteer computing was discussed by Sharada Mohanty. Clemens Lange in his talk titled Open source software projects in high-energy physics: some lessons learned, described how the experiment software is manged for CMS in HEP and gave a comparison between this and the BOINC software. The final two talks of the day were from Levi Rybalov on Incentives for distributed computing: new concepts and methodologies and Violet Su on Beyond Computing: new trends in networked sensors.

The last part of the day was dedicated to breakout sessions to discuss various topics.

- New science applications
- Reducing carbon footprint of distributed computing
- Open-source management methods
- Large-scale computing for AI
- Promoting BOINC on new platforms
- Promoting BOINC as a national cyber infrastructure

The following morning focused on BOINC projects. Andy Bowery gave a status report of climate prediction.net and Rytis Slatkevičius described the science cloud, a way for volunteers to contribute even if they do not have spare resources. Alexander Schöcke gave a talk on sustainable crunching @ home - BOINC vs Home Assistant which explained how he linked his BOINC cluster to his renewable power source in such a way that BOINC will only run when it is generating excess energy.

Following another breakout session concluding the discussions started the previous day, the participants attended the WSIS Prizes 2024 Champions Ceremony, where BOINC was awarded with a prize for its outstanding contribution.
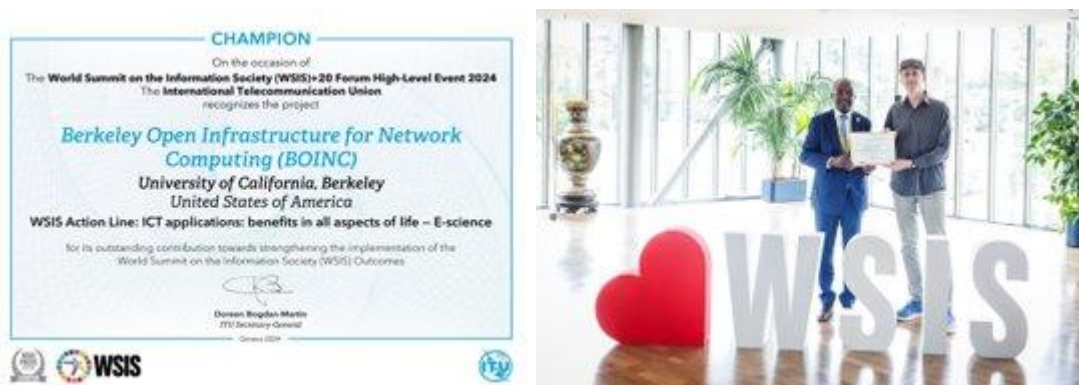
The afternoon session was focused on the BOINC software itself. It focused on new features, software releases and development priorities. In parallel, a session was held in the Science Gateway giving local students an opportunity to hear directly from the project scientists and

for the BOINC project to obtain feedback on usability and motivations for contributing resources.

The final day was dedicated to the BOINC hackathon. A traditional event where the developers sit together, brainstorm and work through issues. The day started with a visit to the Antimatter Decelerator. After this the main topics addressed were accounting, the use of containers, specifically the use of Windows subsystem for Linux, and an alternative html-based GUI for the BOINC client.

Event Impact

The BOINC Workshop attracted 110 registrations with 37 participants physically at the event with the rest attending remotely. It attracted not only existing members of the BOINC community but also newcomers who brought fresh ideas and perspectives. It should be highlighted that in this domain attendees do not necessarily have access to travel budgets and need to fund these trips personally. While a project administrator working for an organisation hosting a project may have funding support, individual volunteers do not. It is for this reason remote participation was made possible even if hybrid events of this type can be challenging.

The event and its participation showed that the BOINC community is still vibrant and active with a vision towards the future. While the volunteer computing landscape is changing from the original concept of running screen savers on desktops, there is considerable excitement for the future with new directions and opportunities. The WSIS prize recognised the contribution that BOINC has made to society and how it can contribute to solving some of societies challenges.

Concretely, the hackathon helped to make progress on the longstanding issue of BOINC credits and how to measure donated compute capacity. The developers designed an architecture of how to use the Window subsystem for Linux in the BOINC client and the idea of a HTML GUI for the client was resurrected.

In general, the workshop helped to invigorate the community and showed exciting prospects for the future such as running BOINC when renewable energy sources are generating excess capacity.

Team Takeaways

Organizing events such as these always takes more effort than anticipated, especially if it is not something that is done often. For those who spend most of the day sitting behind computer screen, the activity is an opportunity to exercise a different skill set which may be outside of our comfort zone.

While some of the previous workshops have been fully remote and this offers all volunteers a chance to participate, there is no substitution for physically meeting face to face. This is especially important for the development teams and project coordinators.

It was rewarding to see the external recognition of the efforts of the community through the WSIS champions award. It gives a wider perspective on the work that has been done and the contribution BOINC has made to society.

The workshop helped to generate new energy for the community and highlighted opportunities for the future.