Jarifa: setting up an institutional Desktop Grid System

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March 9, 2010

1. Background
2. Motivation
3. Proposal
4. Jarifa
   - University of Extremadura
   - Extremadurathome.org
5. Conclusions

Computing Resources in Institutions

- Institutions like Universities have a large number of desktop PCs.
- These PCs are usually underemployed.
- However, the computing power is really good (multi-cores, 1GB of RAM, etc.).

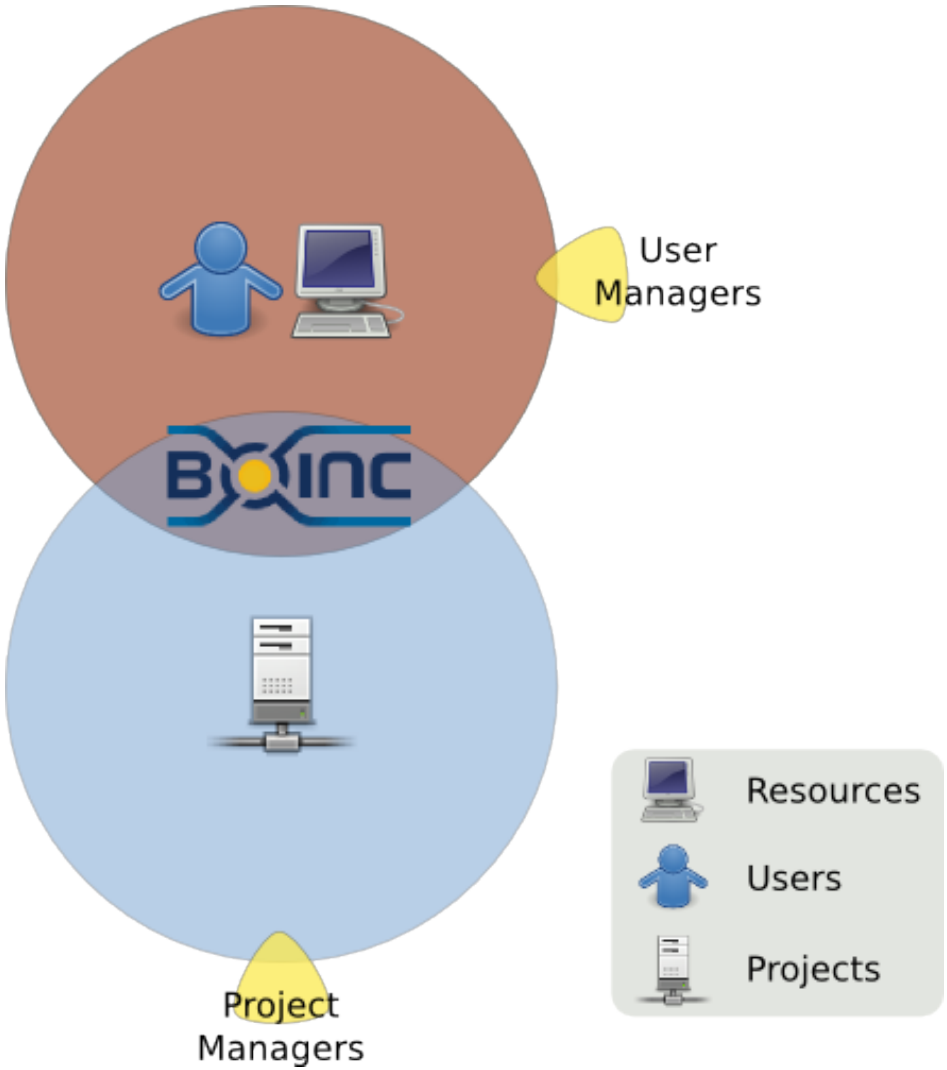
Computing Resources in Institutions

- These resources can be harnessed by means of BOINC.
- BOINC is a middleware widely used by researchers:
  - nearly two million users
  - almost five million computers
  - 4,478.290 TeraFLOPS
- Nevertheless, BOINC is thought and focused around users.

Standard BOINC Model

- BOINC relies on users:
  - The users decide with which project they collaborate.
  - The users decide how much of their resources are donated.
- On the other hand, institutional PCs do not belong to users.

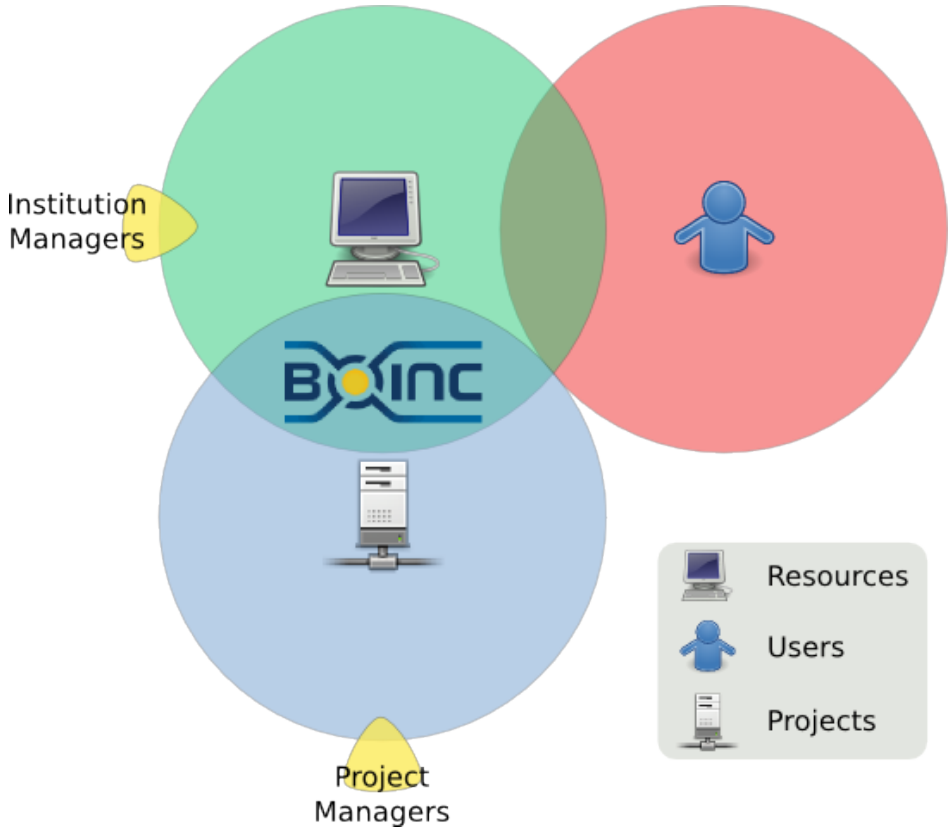
Standard BOINC Model



Resource Based BOINC Model

- Our proposal is a new model where the institution has the power of choice.
- In this model, the user is removed from the decision process.

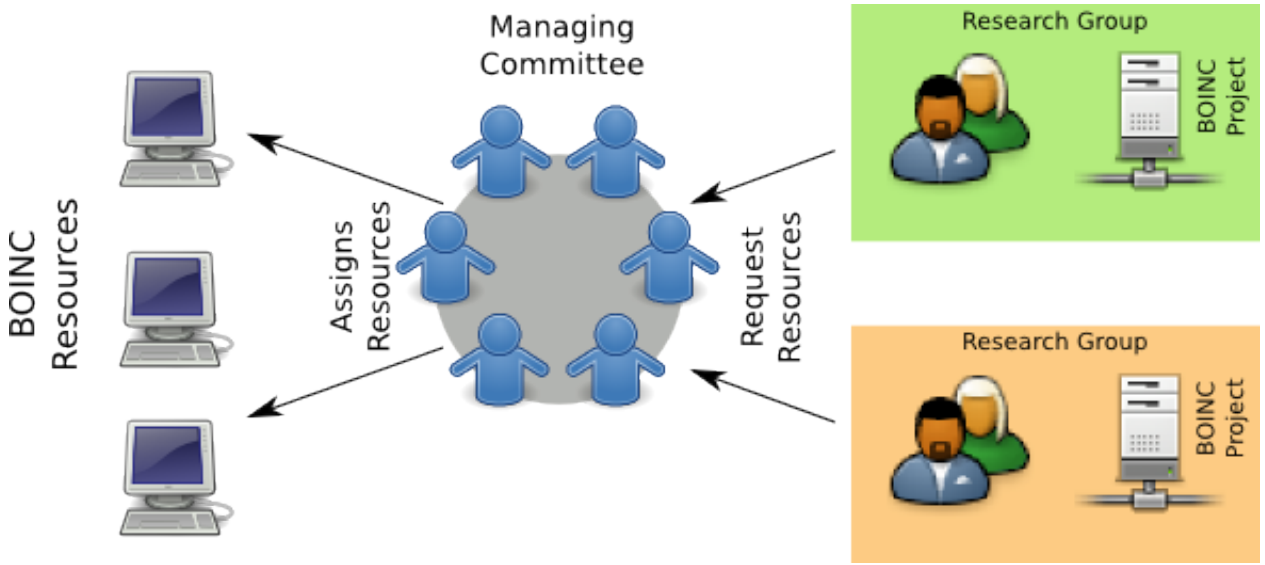
Resource Based BOINC Model



Resource Based BOINC Model

- An institution, that follows this new model, has to be able to remotely manage BOINC:
  - Resources, and
  - Projects.
- With this goal, a software tool has been created to support the new model: *Jarifa*.

BOINC Resource Managing Committee



New Resource Based BOINC Model Difficulties

- Remote PC attaching to BOINC projects.
  - Master-Slave.
  - NAT, Firewalls or Proxy problems.
  - **SOLUTION:** To employ BOINC's Account Manager mechanism.

BOINC's Account Manager Mechanisms

- It is an official and well documented mechanism.
- Based on Web RPCs.
- It uses XML for interchange data.

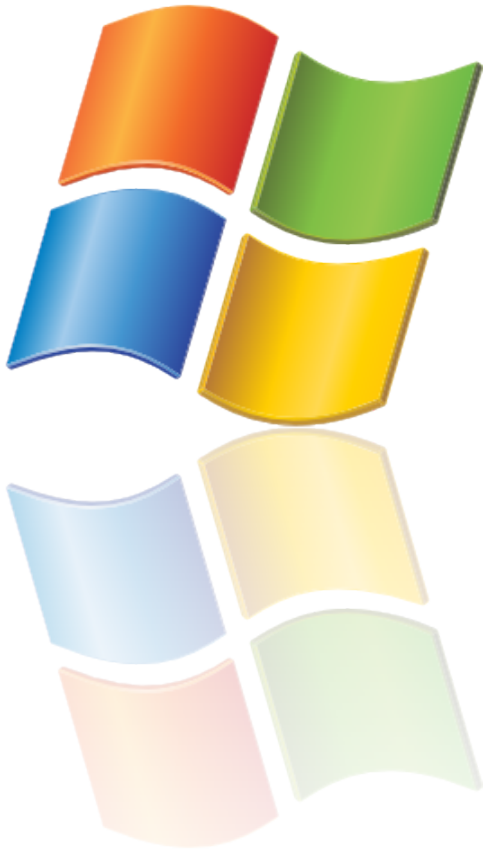

jarifa

The tool

The tool: Different Roles

The tool: Multilanguage

The tool: Multiplatform



License

The Blog: http://jarifa.unex.es

Extremadurathome on regional tv channel

April 2nd, 2009

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BOINC News

- BOINC news March 30, 2009

VTU@home, a project from the Vilnius Gediminas Technical University, is now listed on the Choose Projects page. VTU@home serves Lithuanian scientists. It is

The Wiki: Documentation and Howtos

Login | Settings | Help/Guide | About Trac

Wiki | Browse Source

Start Page | Index by Title | Index by Date | Last Change

Jarifa (a.k.a OGM) is a system for grid computing on organizational resources, using BOINC.

Jarifa is designed for situations where some entities that own computers (Suppliers) have decided to let another entities (the Allocator) decide how their computer time is to be divided among a set of BOINC projects. With Jarifa, Suppliers are able to control the usage of their computers (for example, the hours during which it does BOINC computation). However, they have no control over which BOINC projects their computers contribute to; the Allocator makes that decision.

The BOINC projects to which computing power is given need not be related to either Suppliers or Allocator; they might be public projects like Climateprediction.net or Rosetta@home.

remark: Jarifa uses the 'weak authentication' feature of BOINC. You can only allocate projects, that support this feature (depends on the server version they use).

Jarifa is also designed for situations where the Suppliers' computers are in a public place, or are used by people not trusted by the Supplier; the users have no control over BOINC on the computer.

For example, Suppliers might be different departments in a university, each of which owns a set of desktop and laboratory PCs, and the Allocator might be a campus-wide committee that divides the resources among BOINC projects internal to the university. Or the Suppliers might be different companies, who have agreed to volunteer their PC resources to a philanthropic organization that divides them among public BOINC projects.

Jarifa is implemented using BOINC's Account Manager mechanism. The Allocator runs the Jarifa software on a server. The Suppliers run the BOINC client on their computers, and attach each client to the Allocator's account manager. The BOINC client on the computer periodically communicates with the Jarifa, which instructs it which projects to attach to, and the resource share for each attachment. For further details see Implementation.

Who uses Jarifa?

The installation process is described here.

If you want to download the Jarifa source code, check the following link.

If you want to contact us, check the following link.

Jarifa is licensed under GNU Affero General Public License, version 3.

A Quickstart document is here and here for the BOINC client.

Published papers.

Developers drafts and proposals are here.

Login Screen

Different Roles: Root

Different Roles: Volunteer

Different Roles: Supplier

Different Roles: Allocator

Hosts

Host Features

	**Features**
Supplier	default->Volunteer
Venue	
Number of CPUS	2
Processor Vendor	GenuineIntel
Processor Model	Intel(R) Pentium(R) Dual CPU E2200 @ 2.20GHz [x86 Family 6 Model 15 Stepping 13]
FLOPS	1.99217e+09
IOPS	4.18804e+09
OS	Microsoft Windows XP
Total Credit	3536
RAC	1.38429380393E-12
OS Version	Professional x86 Editon, Service Pack 3, (05.01.2600.00)
Delete	☐
Submit changes	

Pools

			Time		Network		Hard Disk Usage		Memory Usage		
Name	Hosts	Run Always	Start	End	Upload	Download	Max Space	Left Space	Max Active	Max Idle	Supplier
default	130	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Volunteer
default	9	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	La Antigua
default	7	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Nueva Ciudad
default	12	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Almendralejo
default	5	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Villagonzalo
default	8	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Miajadas
default	6	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Solana de los Barros

Pool Options

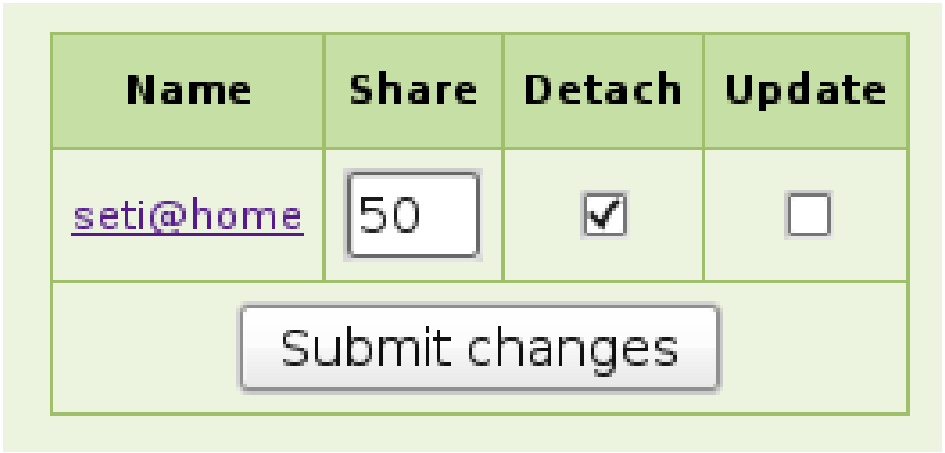
Pool Features	
Pool Name	default
Supplier	Volunteer
Processor usage	
Suspend work while computer is on battery power? (matters only for portable computers)	Yes ◉ No ○
Suspend work while computer is in use?	Yes ◉ No ○
'In use' means mouse/keyboard activity in last	3 minutes
Suspend work if no mouse/keyboard activity in last (Needed to enter low-power mode on some computers) Enforced by version 5.10.14+	0 minutes
Do work only between the hours of (no restriction if equal)	0:00 and 0:00

Projects

Name	Share	Active	Update
seti@home	50	No	No
Einstein@Home	50	No	No
ecj4	50	No	No
ecj5	0	Yes	No
ecj6	0	Yes	No

New Project

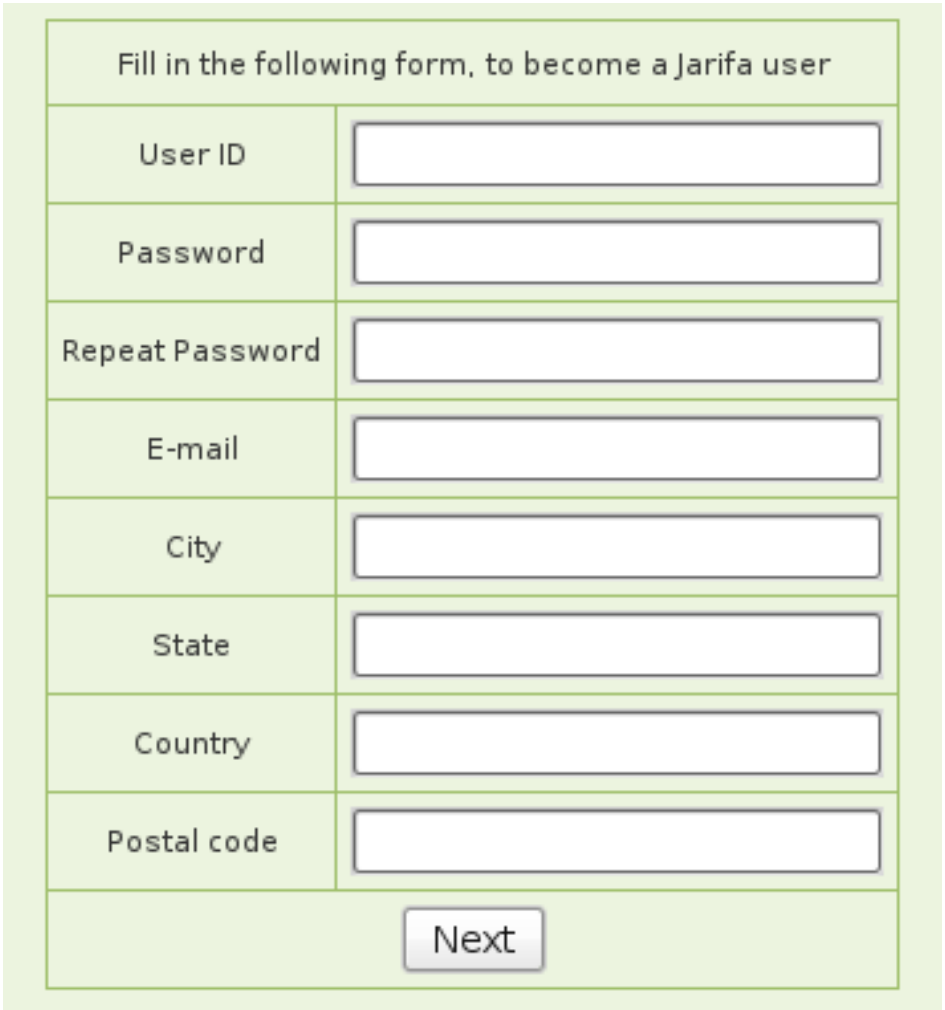
Projects Options



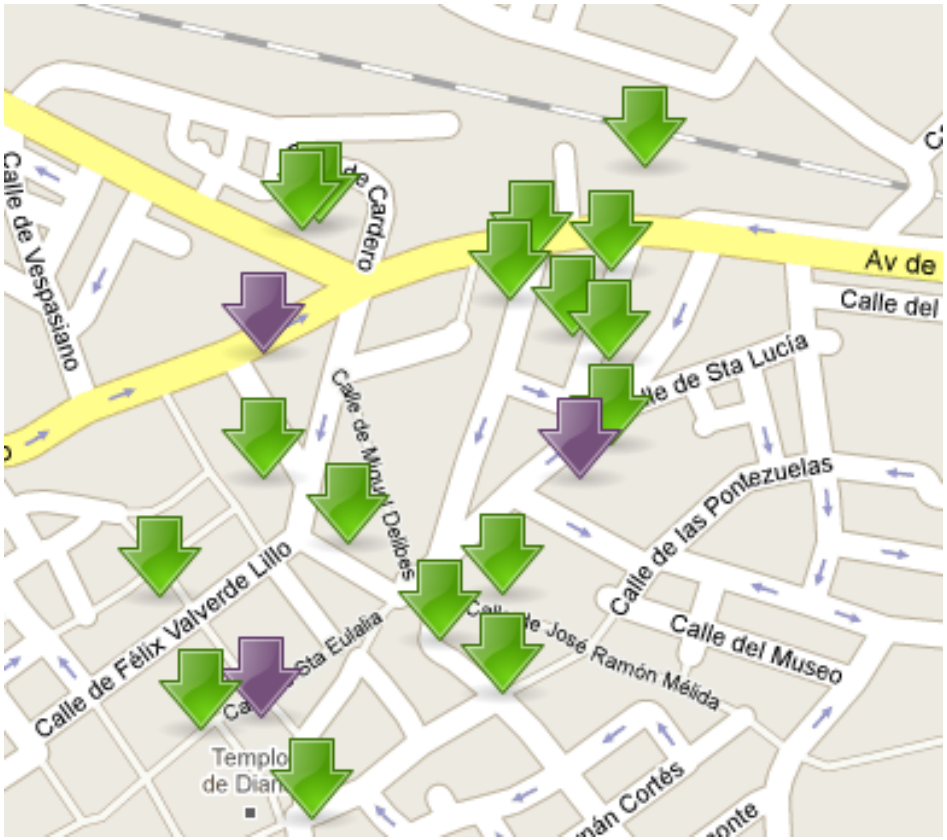
Users


Search...
1 2 3 4 5 ...
User ID
Role
Supplier
BEA
volunteer
Volunteer
Bliss
volunteer
Volunteer
DoverKan
volunteer
Volunteer
DoverKan.com
volunteer
Volunteer
Edboard
volunteer
Volunteer
Emilio Mateu
volunteer
Volunteer
FIFA
volunteer
Volunteer
Gabrinsito
volunteer
Volunteer

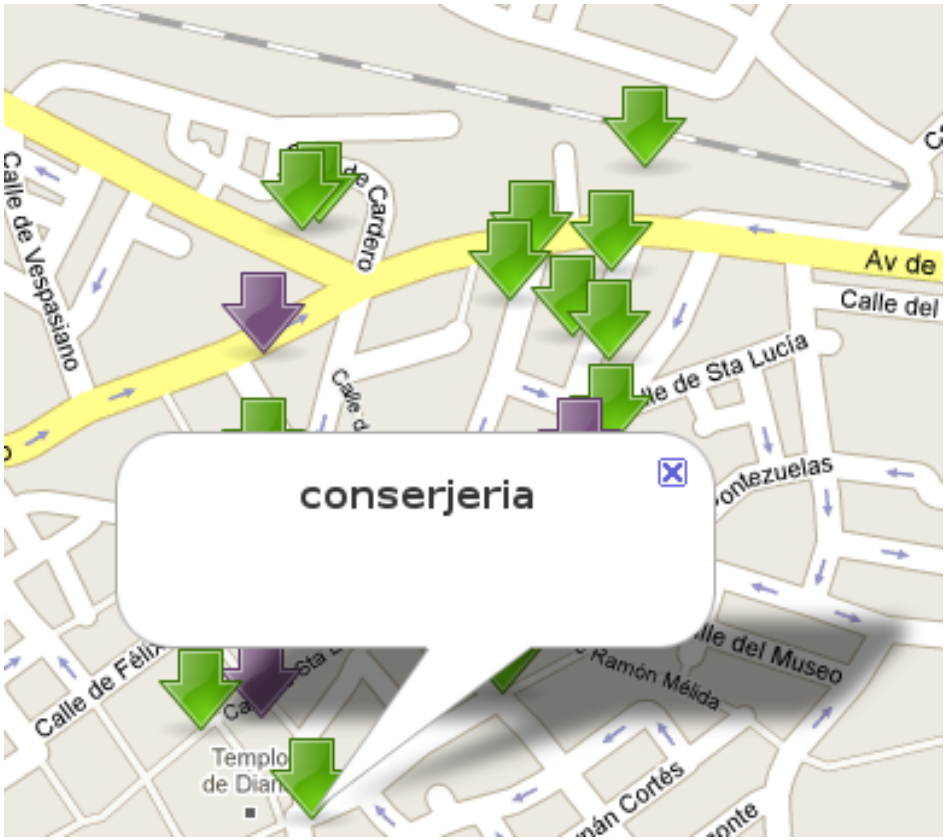
Adding Volunteers



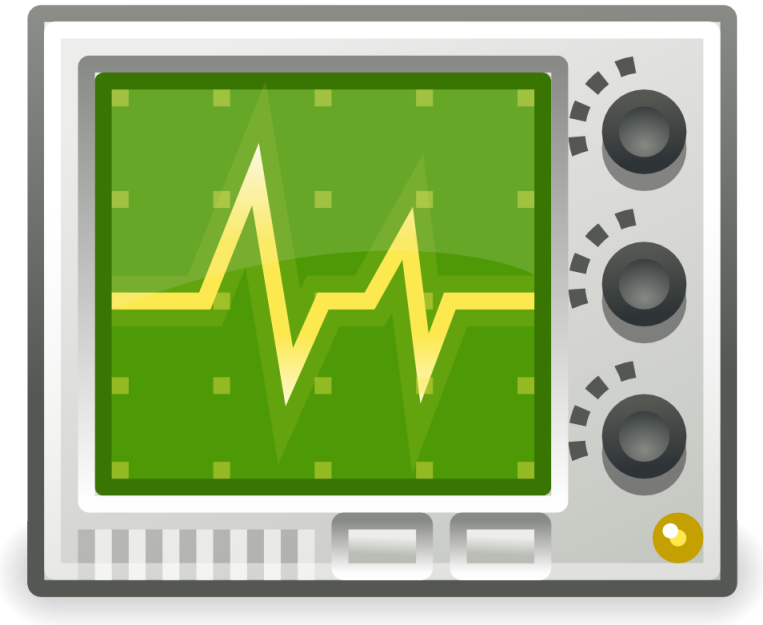
Google Maps Integration



Google Maps Integration



Statistics



Who uses Jarifa?

- Educational Council, Regional Government of Extremadura, Spain (managing 50000 computers).
- Extremadurathome.org project.
- International Potato center.
- Innovation Interligare Institute on Intelligence I4.
- CES Felipe II, Complutense University of Madrid.
- Science and Computer Center of Andalucía, Spain.
- University of Extremadura, Spain.

Special cases

- Two of the presented institutions are going to be analyzed:
  - University of Extremadura, Spain; and
  - Extremadurathome.org project.


UNIVERSIDAD DE EXTREMADURA

Infrastructure

- The server is a virtual machine (Xen) with 1 GB of RAM and 1 core Intel Xeon at 2.0 GHz.
- The server is also dedicated to other project: Extremadurathome.org.
- The running OS is a Debian Etch version (LAMP server).

Numbers

- 10 Suppliers:
  - Computer and Science Center of Andalucía, Spain.
  - University of Granada, Spain.
  - Regional Government of Extremadura, Spain.
  - Politechnique University of Valencia, Spain.
  - National University of Distance learning, Spain.
  - Complutense University of Madrid, Spain.
  - International Potato Center, Perú.
- 14 Volunteers.
- 355 Computers.

Projects

Name	Share	Active	Update
seti@home	50	No	No
Einstein@Home	50	No	No
ecj4	50	No	No
ecj5	0	Yes	No
ecj6	0	Yes	No

New Project

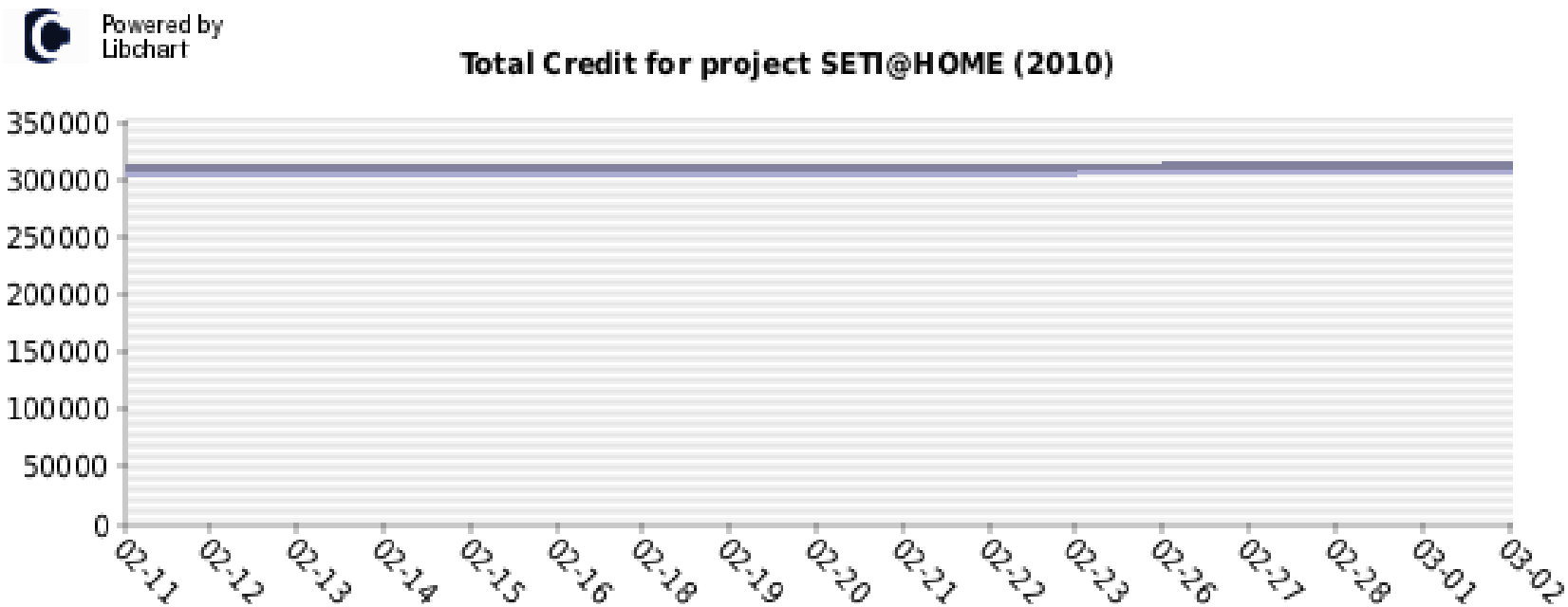
Engaging Volunteers

Position	User	Total credit
1	argimate	114116.34
2	magop	72135.3
3	bienvegise	23962.6
4	BEA	23836.7
5	sebitas81	21451.34
6	angel_ncc	18294.85
7	discolo	17913.98
8	frchavez	17673.32
9	pchavez	12873.34
10	nano	11676.5

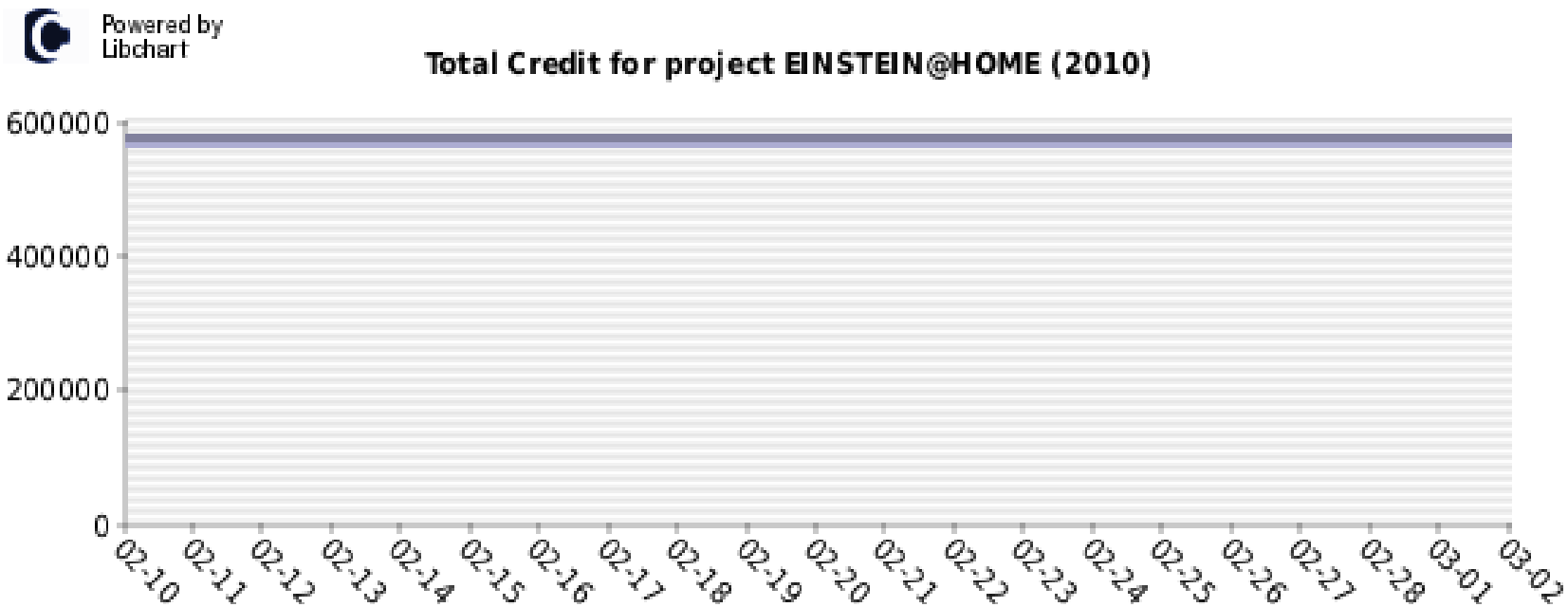
Statistics

- Two type of statistics can be checked:
  1. Jarifa statistics: Total credit and GFLops based on BOINC credit.
  2. Official BOINC statistics in BOINC statistics web pages like:
     - BOINCstats.com.
     - The Knights Who Say 'Ni' stats.
     - etc.

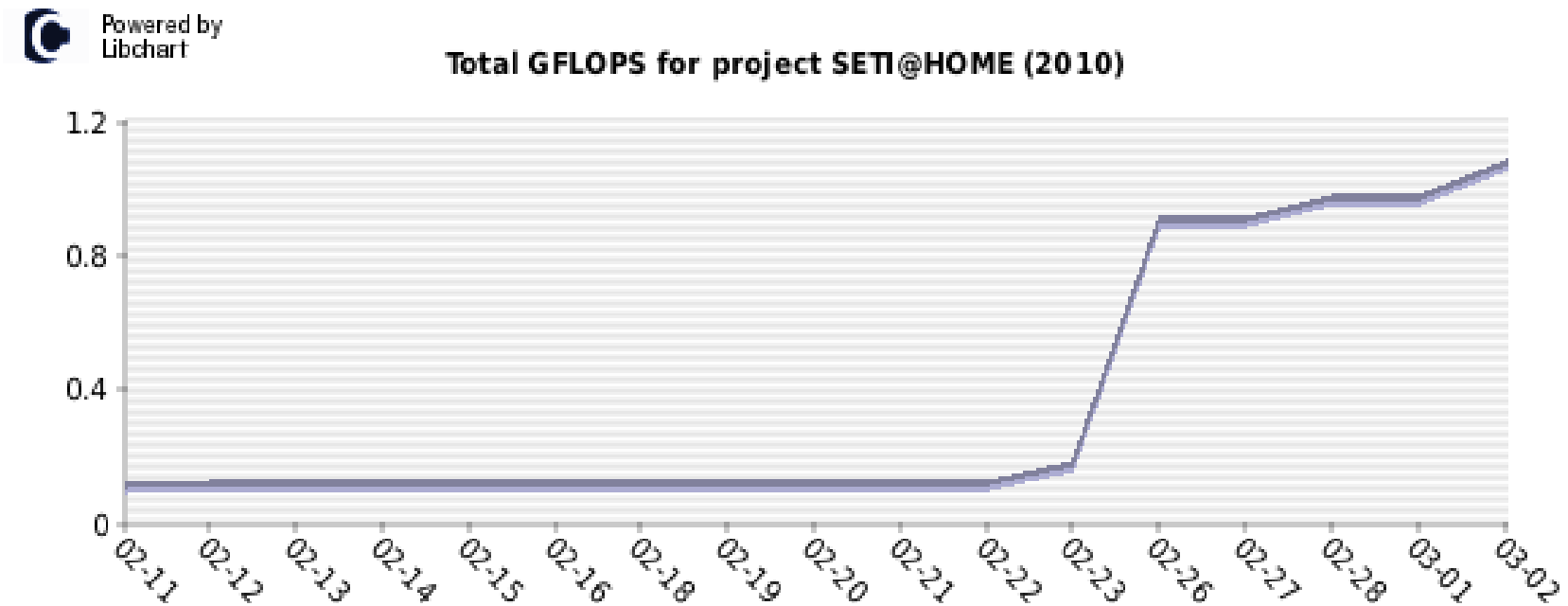
Jarifa Statistics: Total credit for SETI@home



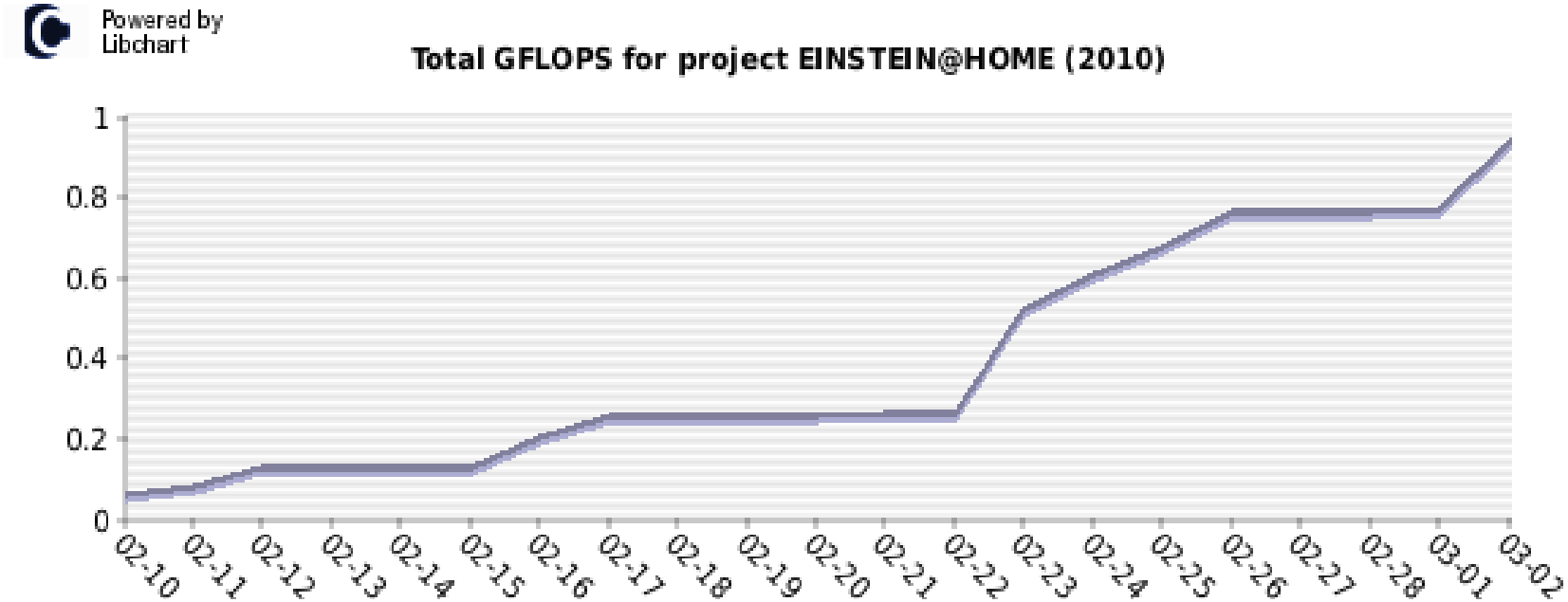
Jarifa Statistics: Total credit for Einstein@home



Jarifa Statistics: GFlops for SETI@Home

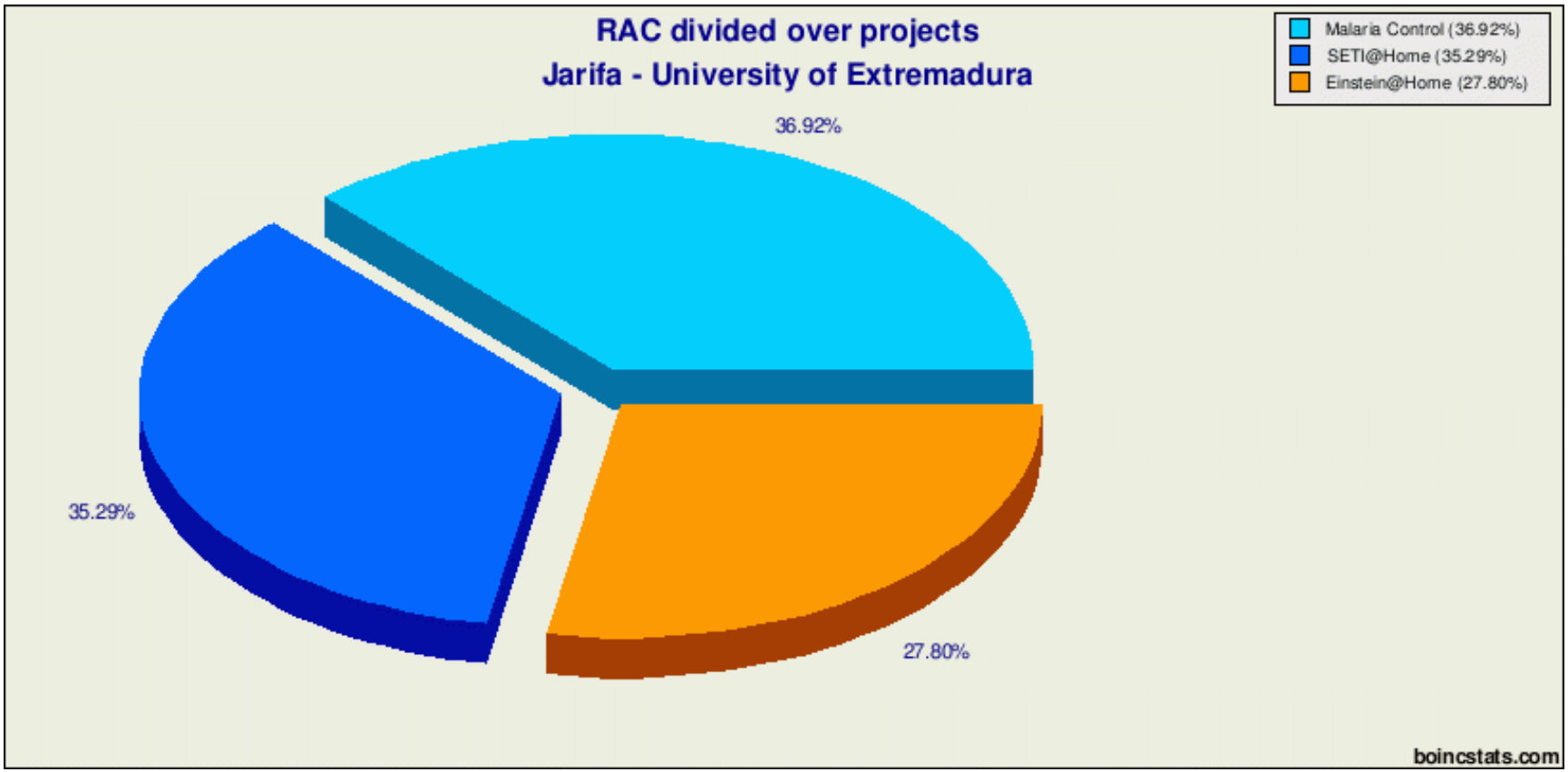


Jarifa Statistics: GFlops for Einstein@Home

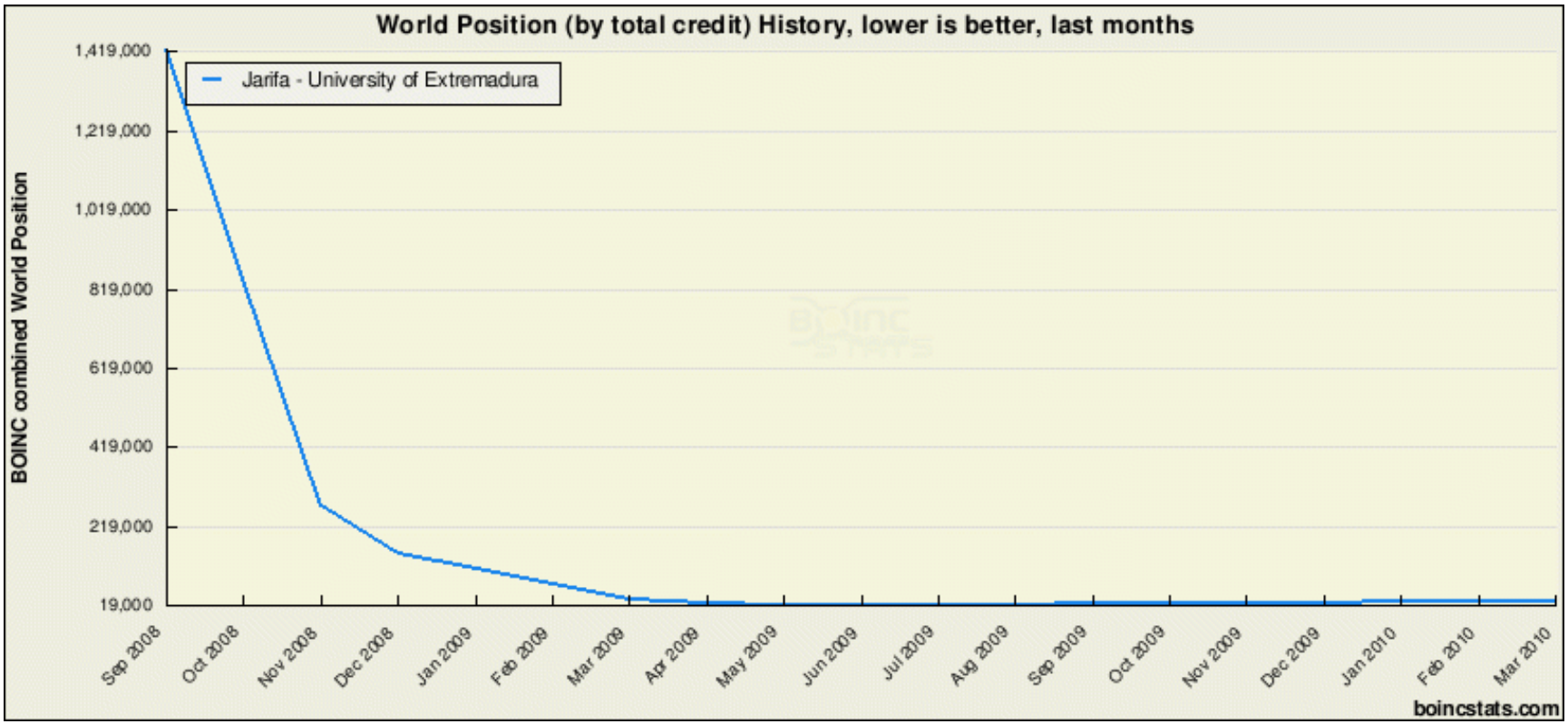


Boincstats.com data

Boincstats.com data



Boincstats.com data




EXTREMADURATHOME

The goal

- It is a popular science web page.
- The aim is to make citizens participants of science trough BOINC.
- The core is a CMS and Jarifa.

The web page: www.extremadurathome.org

Engaging volunteers

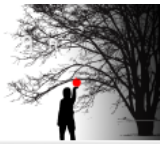
Prizes

Prizes

Promoting the project on regional TV and Radio

EXTREMADURATHOME
Sensibilización de la Ciudadanía para el uso de la Computación Voluntaria

Te gustaria poder ayudar a la CIENCIA?



- Inicio
- EXTREMADURATHOME
- Computación Voluntaria
- Grupo Destinatario
- Organización
- Contacto
- Entidades Adheridas
- Talleres Informativos

RED DE INVESTIGADORES

Computación Voluntaria en Canal Extremadura

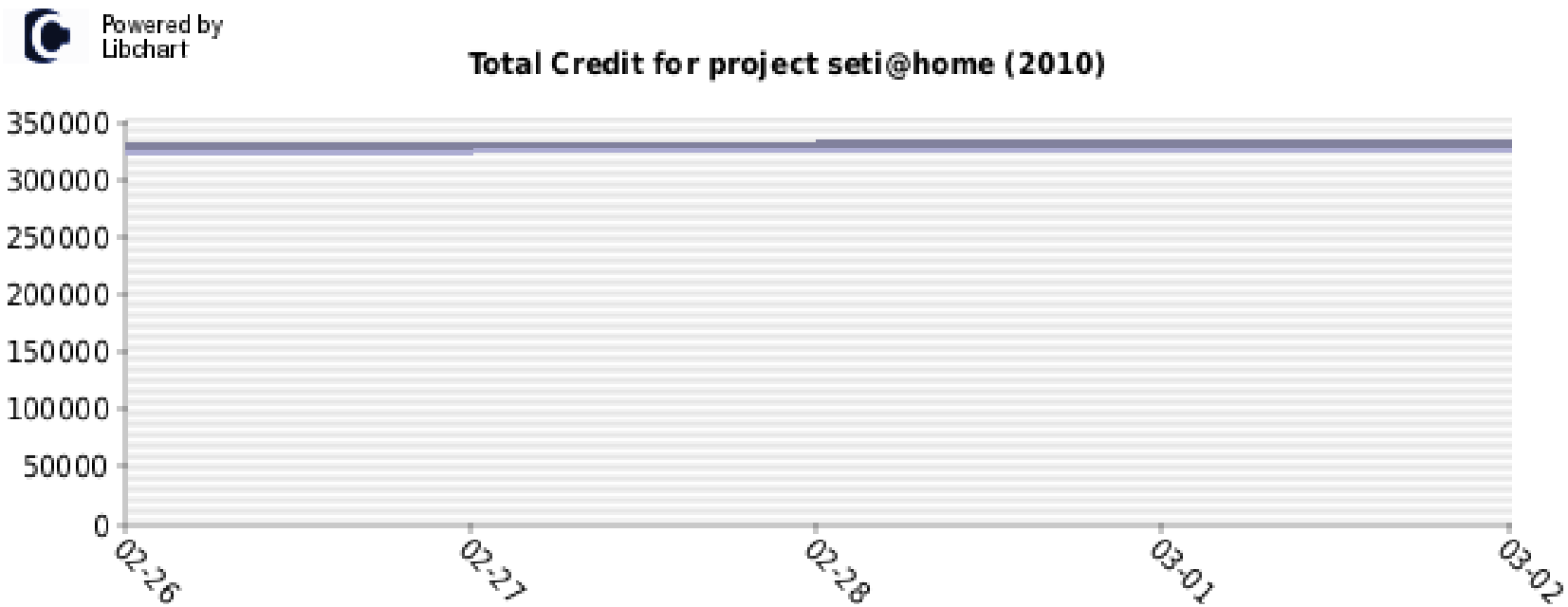
Numbers

- 477 Volunteers.
- 46 Suppliers: Regional literacy campaign on technology and open source.
- 896 Computers.

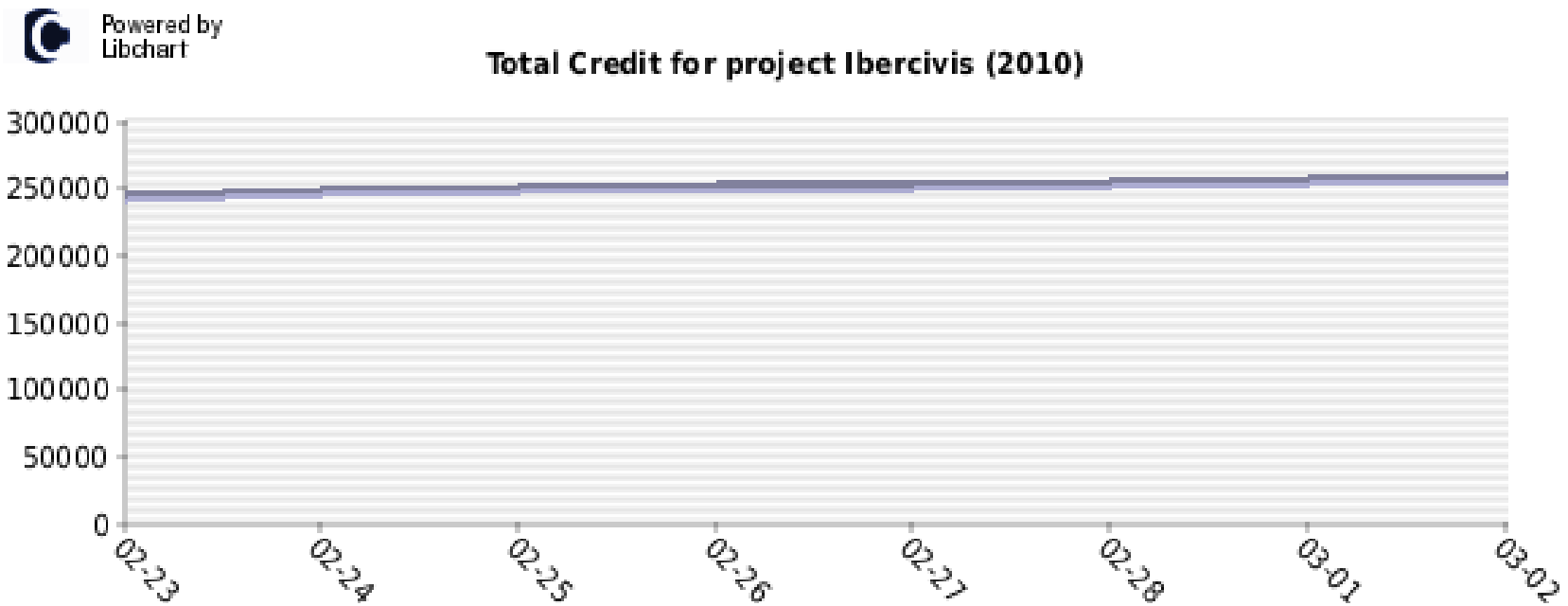
Projects

- Projects are voted by participants.
- The most voted projects enter Jarifa.
- Right now there is an open poll with different projects:
  - Seti@Home
  - Einstein@Home
  - Climateprediction
  - Ibercivis
  - Dwave
  - Malariacontrol
  - LHC@Home
  - Primegrid
  - Milkyway@Home

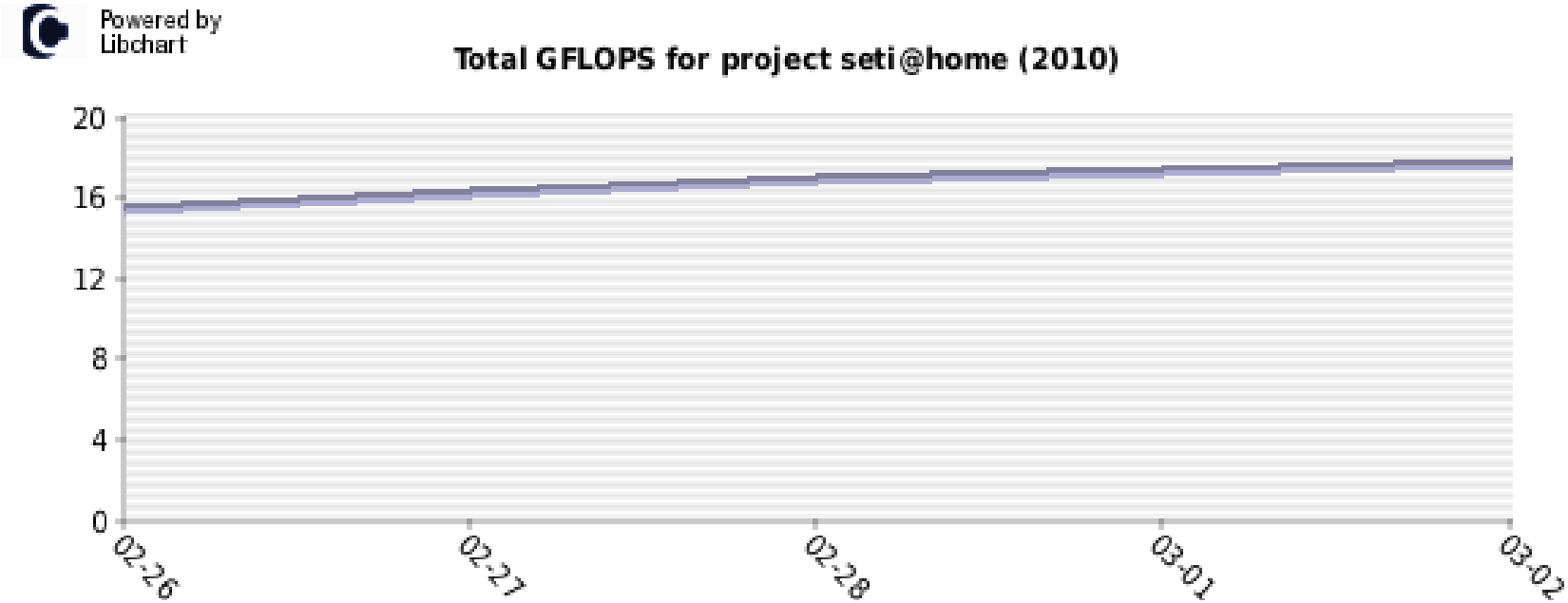
Jarifa Statistics: Total credit for SETI@home



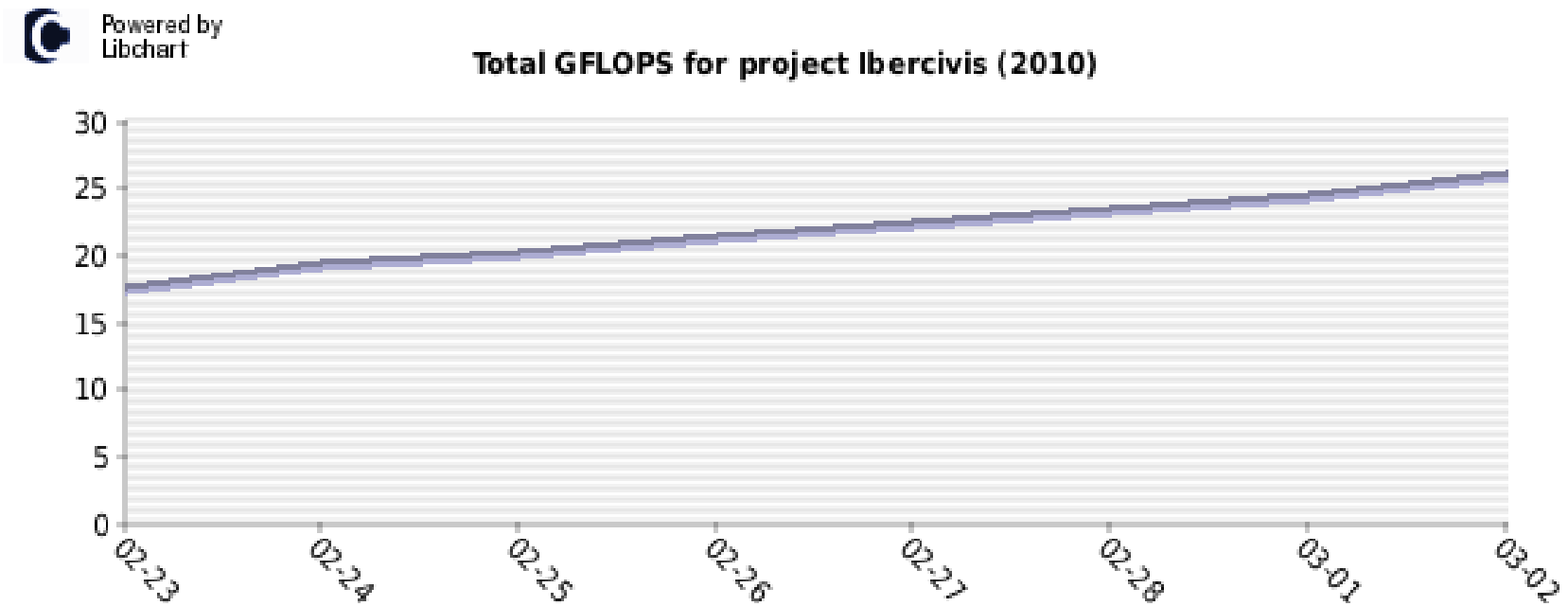
Jarifa Statistics: Total credit for Ibercivis



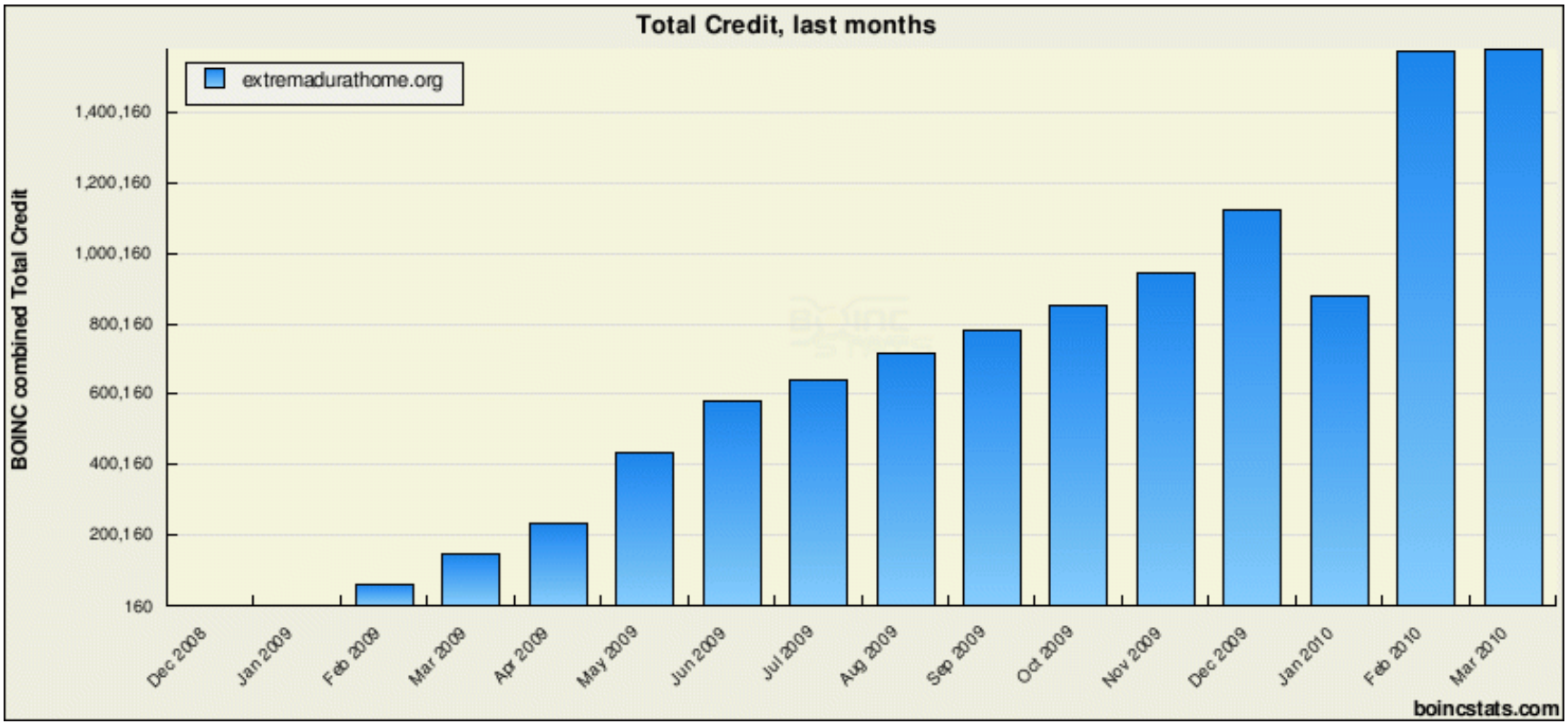
Jarifa Statistics: GFlops for SETI@Home



Jarifa Statistics: GFlops for Ibercivis



Boincstats.com data



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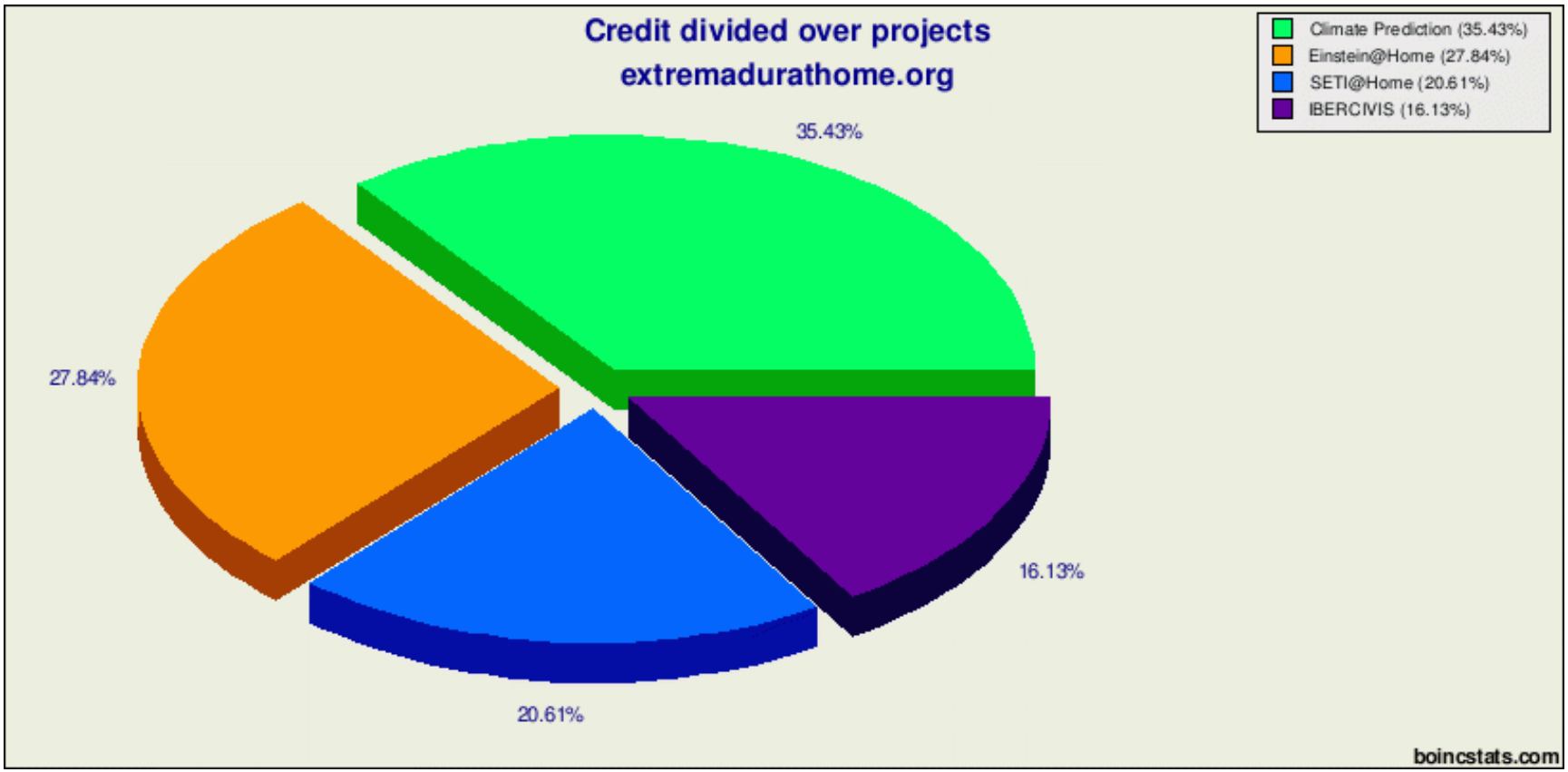

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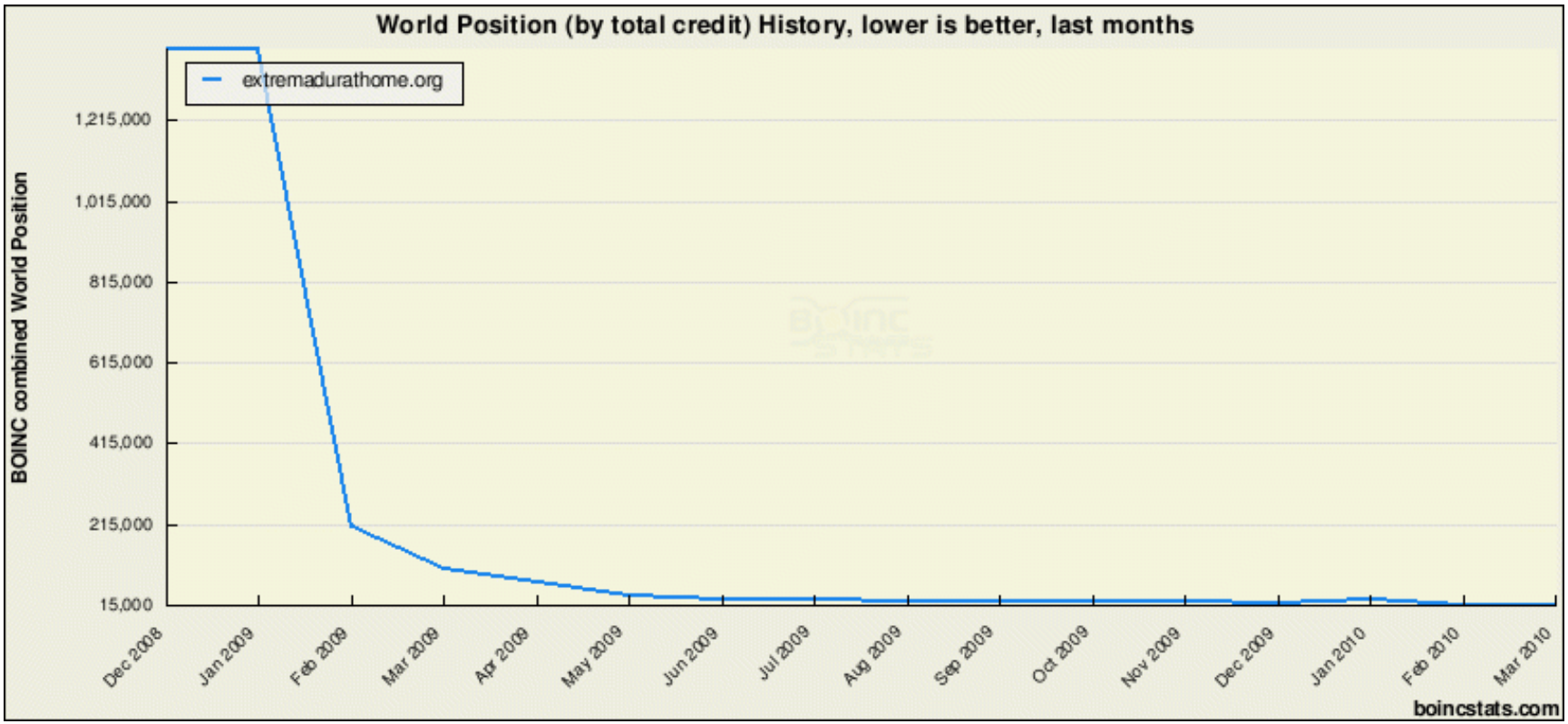

New features

- Since the development, new features have been implemented:
  - New poll system.
  - Integration with Identi.ca (the open source Twitter).
- As well as bug-fixes and general improvements.

Conclusions

- We have presented a new BOINC Resource based model.
- The new model replaces the final user for an Institution.
- We have shown a new tool which enables the model.
- Two successful projects have been presented.

Questions

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