

# 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.).

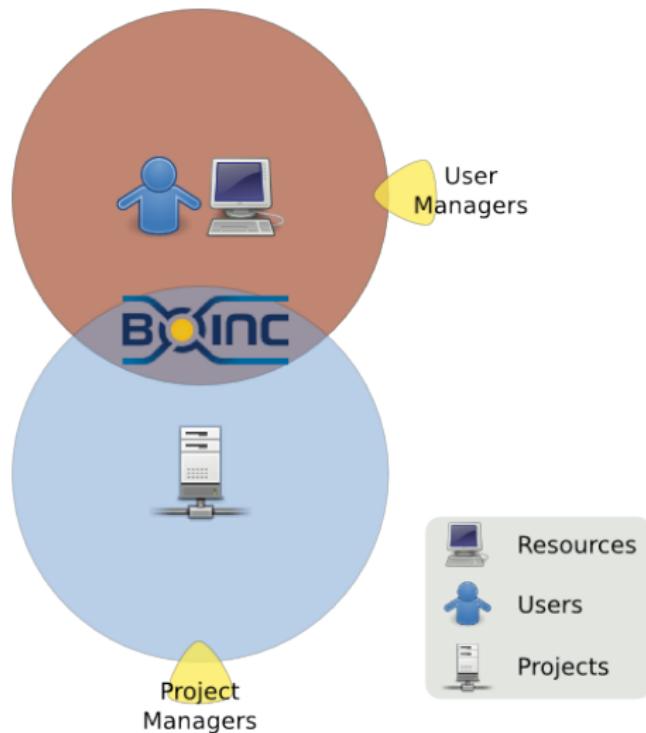
# Computing Resources in Institutions

- 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.

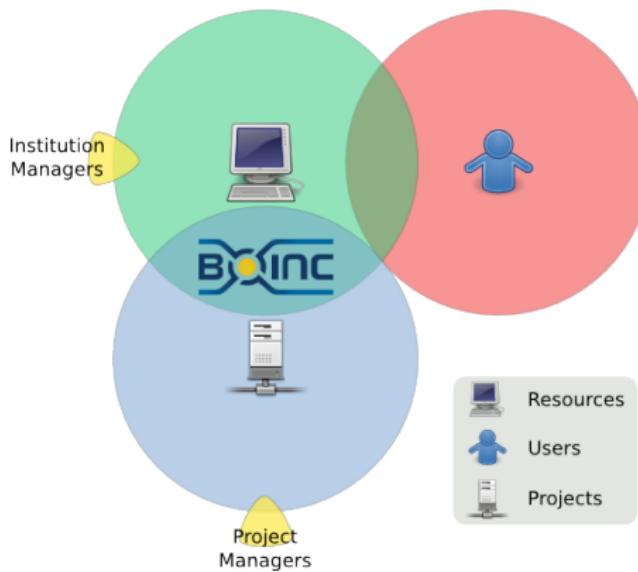
# Standard BOINC Model



# 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.

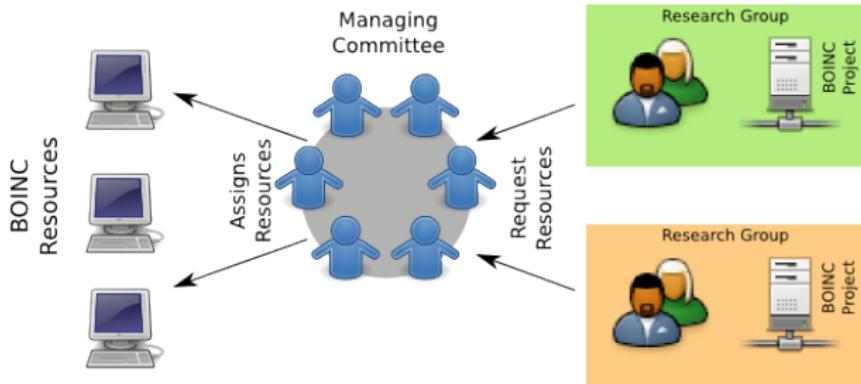
# Resource Based BOINC Model



# 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.



# The tool



# The tool: Different Roles



Root



Supplier



Volunteer

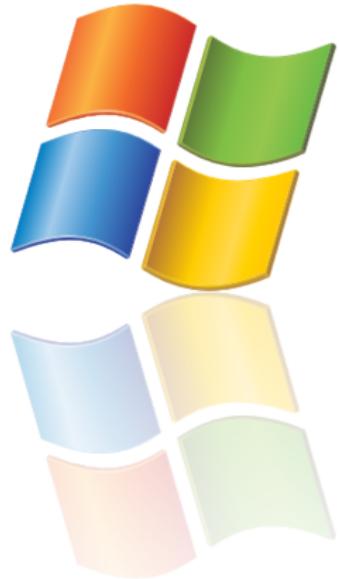
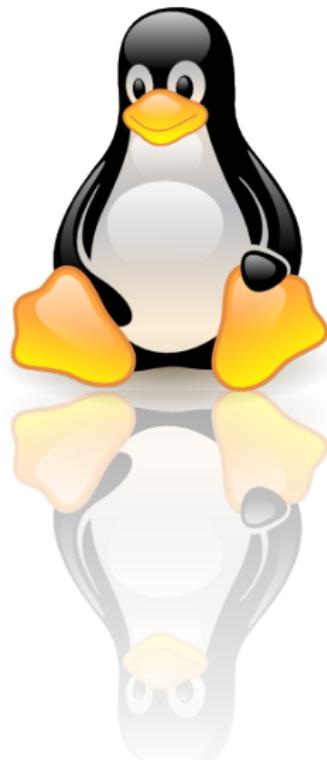


Allocator

# The tool: Multilanguage



# The tool: Multiplatform



## License



*Free as in Freedom*

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



## Extremadurathome on regional tv channel

April 2nd, 2009

### Extremadurathome en Canal Extremadura



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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 server Lithuanian scientists. It is



# The Wiki: Documentation and Howtos



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**Jarifa** (a.k.a OGIM) 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



The logo features a stylized 'J' and 'r' in purple, followed by 'arifa' in black.

User

Password

Minimum BOINC core client version: 6.0  
If you want to collaborate with us, [Join us](#)  
Powered by 187 Volunteers and 46 Suppliers  
Computers: 449  
[Best volunteers](#)  
[Map](#)

# Different Roles: Root



Welcome daniel

<ul style="list-style-type: none"><li><a href="#">Start</a></li><li><a href="#">Projects</a></li><li><a href="#">Hosts</a></li><li><a href="#">Pools</a></li><li><a href="#">Users</a></li><li><a href="#">Statistics</a></li><li><a href="#">Log Out</a></li></ul>	<p>Choose an action from the left panel</p>
---	---

# Different Roles: Volunteer

Welcome daniel2

- [Start](#)
- [Hosts](#)
- [Profile](#)
- [Log Out](#)

Choose an action from the left panel

Position	User	Total credit
169/187	daniel2	0

# Different Roles: Supplier

The screenshot shows the Jarifa application interface. At the top, there is a purple header bar with the word "Supplier" in white. Below this is a light green main area. In the center, there is a large, stylized logo consisting of a purple circle and the word "Jarifa" in black. To the left of the logo, the text "Welcome aldea" is displayed. On the far left, there is a vertical sidebar with a light green background containing a list of navigation links. To the right of the sidebar, the main content area has a light green background and contains the text "Choose an action from the left panel".

Welcome aldea

- [Start](#)
- [Hosts](#)
- [Profile](#)
- [Pools](#)
- [Statistics](#)
- [Log Out](#)

Choose an action from the left panel

# Different Roles: Allocator

The screenshot shows the Jarifa Allocator application interface. At the top, there is a large green header area featuring the Jarifa logo, which consists of a stylized purple 'j' followed by the word 'jarifa' in a black, lowercase, sans-serif font. Below the logo, the text "Welcome allocator" is displayed in a bold, black, sans-serif font. To the left of the main content area, there is a sidebar with a light green background. It contains a list of navigation links: "Start", "Profile", "Projects", "Statistics", and "Log Out", each preceded by a small blue bullet point. To the right of the sidebar, the main content area has a light green background and contains the text "Choose an action from the left panel" in a bold, black, sans-serif font.

# Hosts

Host	Pool	Supplier
	default	Volunteer
	default	Volunteer
	default	Volunteer
	default	Volunteer
	default	Volunteer
	default	Volunteer
	default	Volunteer
	default	Volunteer
	default	Volunteer

# Host Features

	Features
Supplier	<input type="text" value="default-&gt;Volunteer"/> <input type="button" value="▼"/>
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 Edition, Service Pack 3, (05.01.2600.00)
Delete	<input type="checkbox"/>
<input type="button" value="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
<u>default</u>	130	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Volunteer
<u>default</u>	9	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	La Antigua
<u>default</u>	7	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Nueva Ciudad
<u>default</u>	12	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Almendralejo
<u>default</u>	5	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Villagonzalo
<u>default</u>	8	No	00:00	00:00	0 KB/s	0 KB/s	100 GB	0.001 GB	50 %	90 %	Mijadas
<u>default</u>	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

<b>Pool Features</b>	
Pool Name	<input type="text" value="default"/>
Supplier	<input type="text" value="Volunteer"/> <input type="button" value="▼"/>
<b>Processor usage</b>	
Suspend work while computer is on battery power? (matters only for portable computers)	Yes <input checked="" type="radio"/> No <input type="radio"/>
Suspend work while computer is in use?	Yes <input checked="" type="radio"/> No <input type="radio"/>
'In use' means mouse/keyboard activity in last	<input type="text" value="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+	<input type="text" value="0"/> minutes
Do work only between the hours of (no restriction if equal)	<input type="text" value="0:00"/> and <input type="text" value="0:00"/>

# Projects

Name	Share	Active	Update
<a href="#"><u>seti@home</u></a>	50	No	No
<a href="#"><u>Einstein@Home</u></a>	50	No	No
<a href="#"><u>eci4</u></a>	50	No	No
<a href="#"><u>eci5</u></a>	0	<b>Yes</b>	No
<a href="#"><u>eci6</u></a>	0	<b>Yes</b>	No

[New Project](#)

# Projects Options

Name	Share	Detach	Update
<u>seti@home</u>	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Submit changes</b>			

# Users



[1](#) [2](#) [3](#) [4](#) [5](#) ...

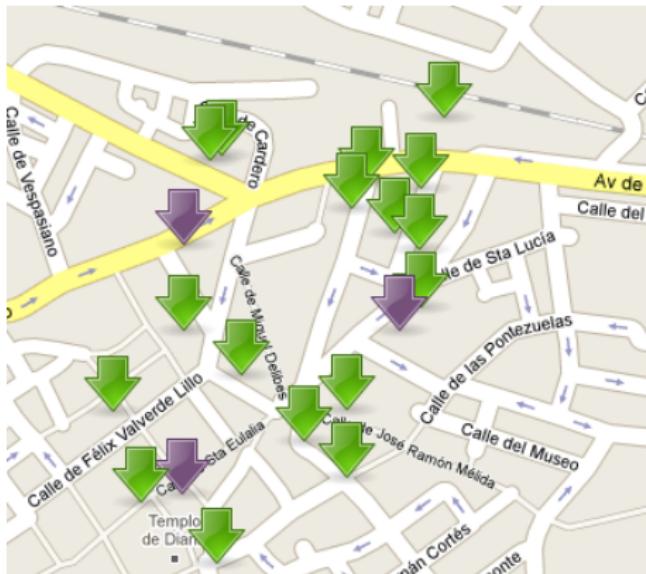
User ID	Role	Supplier
<a href="#">BEA</a>	volunteer	Volunteer
<a href="#">Bliss</a>	volunteer	Volunteer
<a href="#">DoverKan</a>	volunteer	Volunteer
<a href="#">DoverKan.com</a>	volunteer	Volunteer
<a href="#">Edboard</a>	volunteer	Volunteer
<a href="#">Emilio Mateu</a>	volunteer	Volunteer
<a href="#">FIFA</a>	volunteer	Volunteer
<a href="#">Gabrinsito</a>	volunteer	Volunteer

# Adding Volunteers

Fill in the following form, to become a Jarifa user

User ID	<input type="text"/>
Password	<input type="password"/>
Repeat Password	<input type="password"/>
E-mail	<input type="text"/>
City	<input type="text"/>
State	<input type="text"/>
Country	<input type="text"/>
Postal code	<input type="text"/>
<input type="button" value="Next"/>	

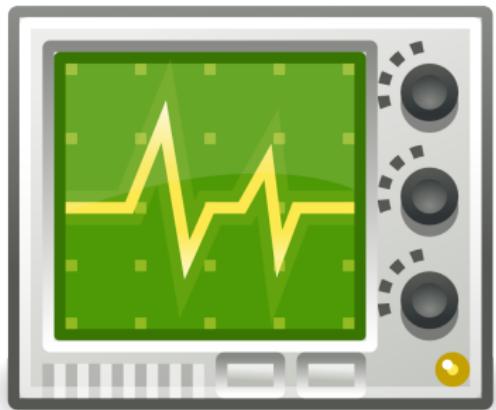
# Google Maps Integration



# 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.



# 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
<a href="#"><u>seti@home</u></a>	50	No	No
<a href="#"><u>Einstein@Home</u></a>	50	No	No
<a href="#"><u>eci4</u></a>	50	No	No
<a href="#"><u>eci5</u></a>	0	<b>Yes</b>	No
<a href="#"><u>eci6</u></a>	0	<b>Yes</b>	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

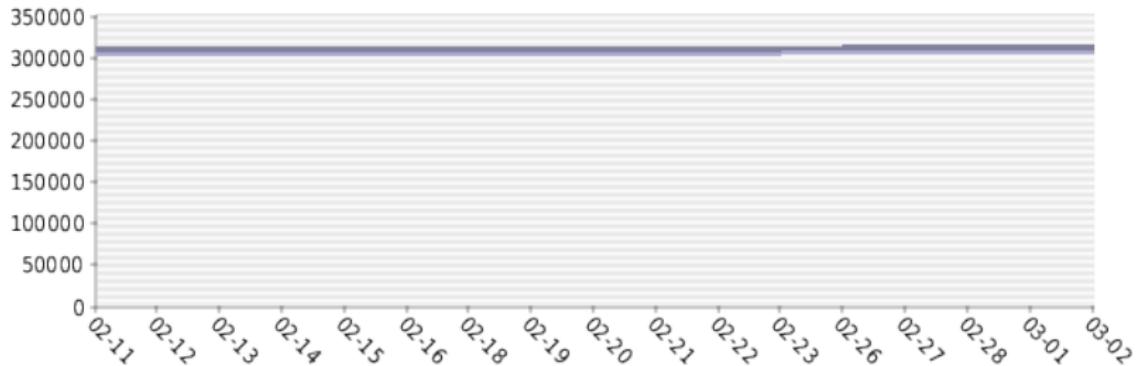
# Statistics

- 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

Powered by  
Libchart

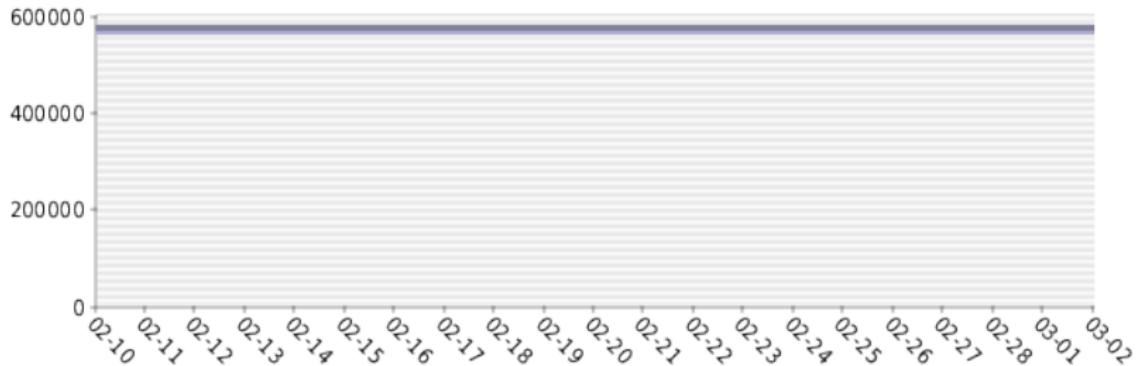
**Total Credit for project SETI@HOME (2010)**



# Jarifa Statistics: Total credit for Einstein@home

Powered by  
Libchart

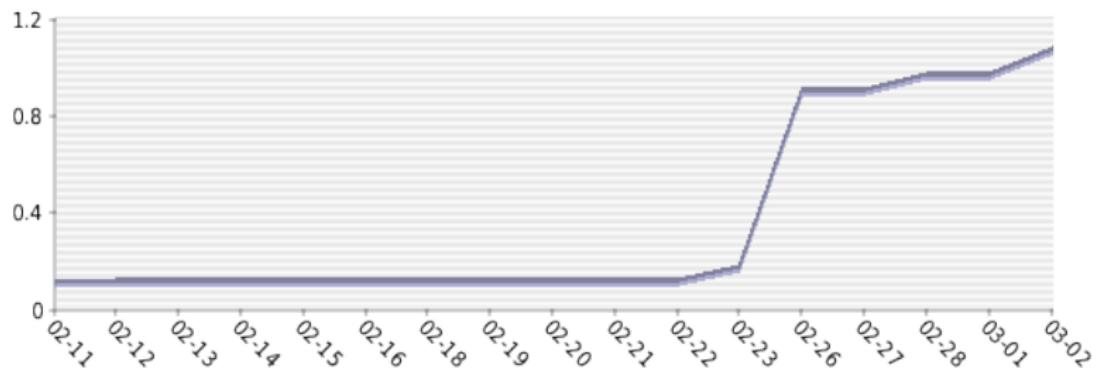
Total Credit for project EINSTEIN@HOME (2010)



# Jarifa Statistics: GFlops for SETI@Home

Powered by  
Libchart

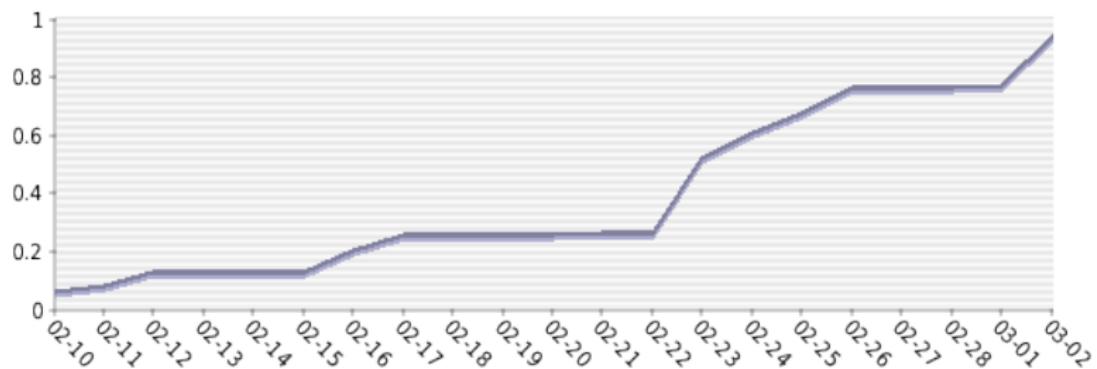
Total GFLOPS for project SETI@HOME (2010)



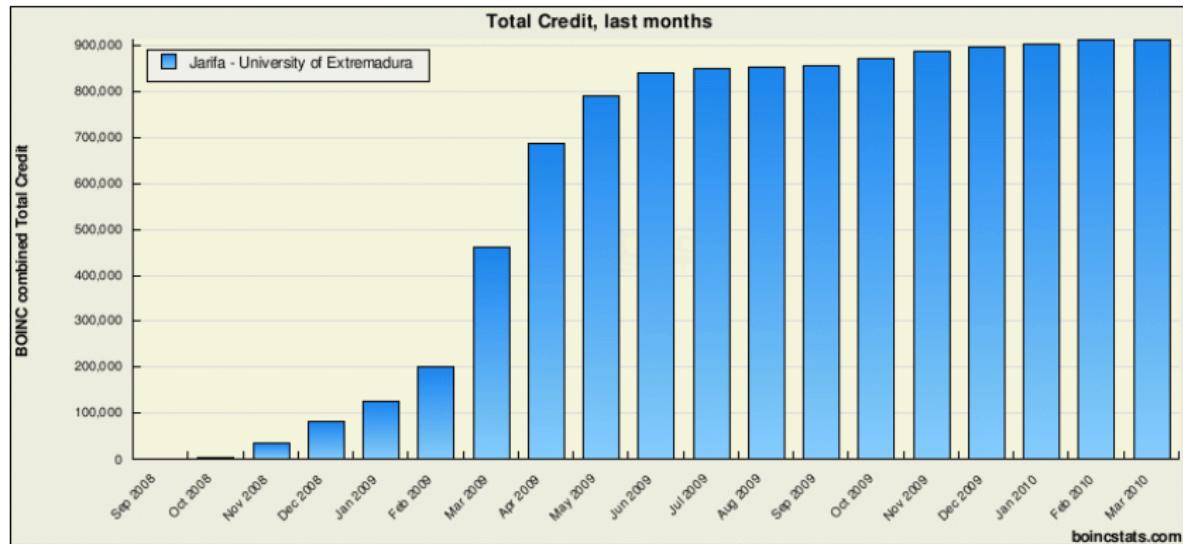
# Jarifa Statistics: GFlops for Einstein@Home

Powered by  
Libchart

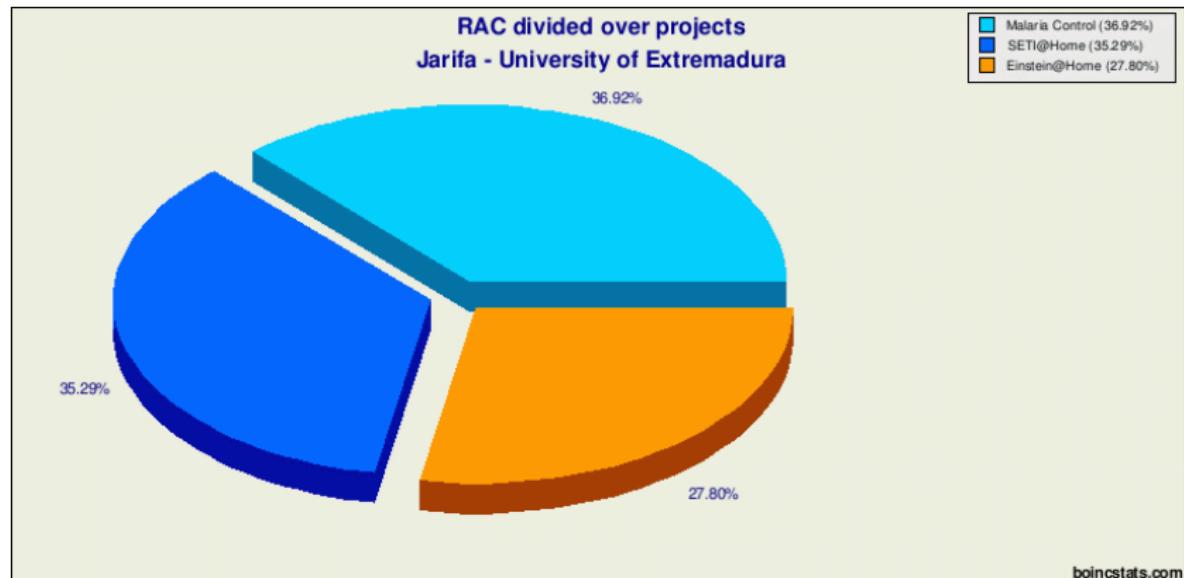
Total GFLOPS for project EINSTEIN@HOME (2010)



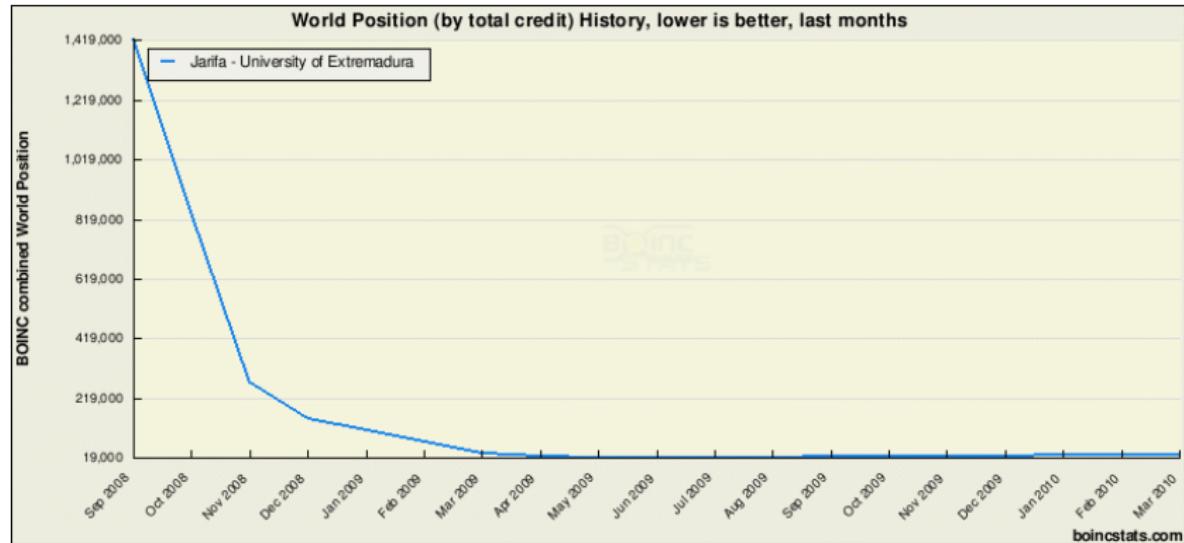
# Boincstats.com data



# Boincstats.com data



# Boincstats.com data





**EXTREMADURA**THOME  
**EXTRAMADURAMONTE**

# The goal

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

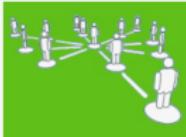
# The web page: www.extremadurathome.org



Sensibilización de la Ciudadanía para el uso de la Computación Voluntaria

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

## RED DE VOLUNTARIOS



## EXTREMADURATHOME

La semana cultural del Centro Universitario de Mérida dedica un espacio a la computación voluntaria



Coincidiendo con la Semana Cultural del Centro Universitario de Mérida, que se celebrará hasta el domingo 26, y que acoge entre sus jornadas contenidos sobre sanidad, telemática, orientación profesional o topografía, se ha dedicado un espacio en la mañana del martes para realizar un taller de difusión de la Computación Voluntaria a través del proyecto Extremadura at Home.

Así los asistentes pudieron comprobar lo fácil que puede ser colaborar con proyectos de investigación científica que les interesen.

## EXTREMADURATHOME en Internautas en Acción - Navaconcejo



La jornada "Internautas en Acción" celebrada el sábado 10 de abril en Navaconcejo ha acogido un taller sobre

Te gustaría poder  
ayudar a la  
CIENCIA?



EXTREMADURATHOME en  
Canal Extremadura Radio.



COMPUTACIÓN  
VOLUNTARIA EN  
CANAL  
EXTREMADURA



flickr

PARA VOLUNTARIADO

- Cómo Participar

# Engaging volunteers



flickr

The image shows the Flickr logo. It consists of the word "flickr" in a bold, sans-serif font. The letters are colored in a gradient: blue for "f", "l", and "i", light blue for "c", and pink for "k" and "r".

# Prizes



# Prizes



# Promoting the project on regional TV and Radio



Sensibilización de la Ciudadanía para el uso de la Computación Voluntaria

Te gustaría poder  
ayudar a la  
CIENCIA?



- Inicio
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- 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.

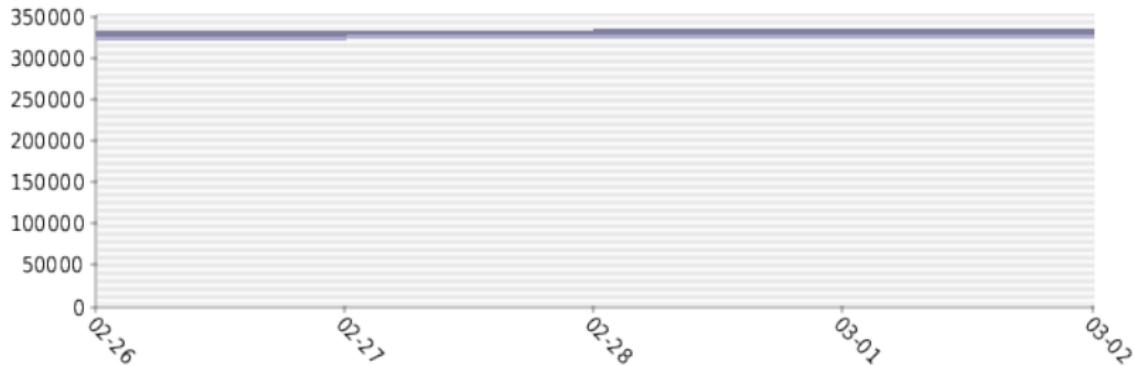
# Projects

- 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

Powered by  
Libchart

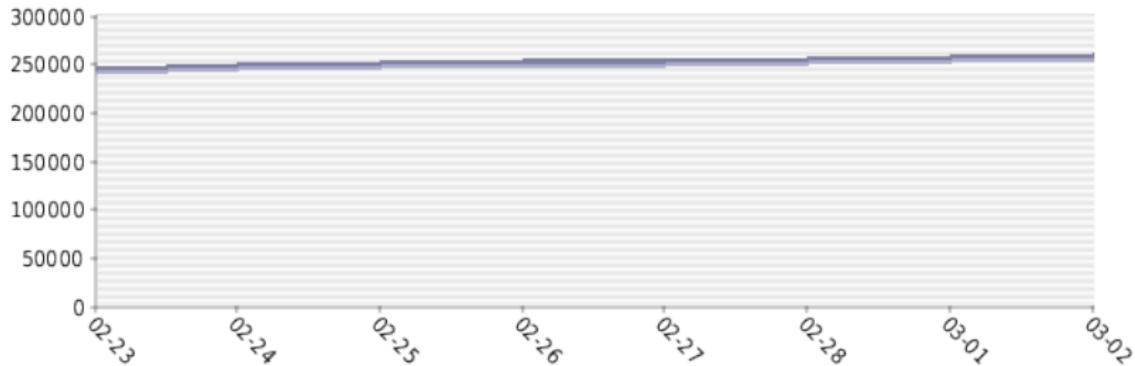
Total Credit for project seti@home (2010)



# Jarifa Statistics: Total credit for Ibercivis

Powered by  
Libchart

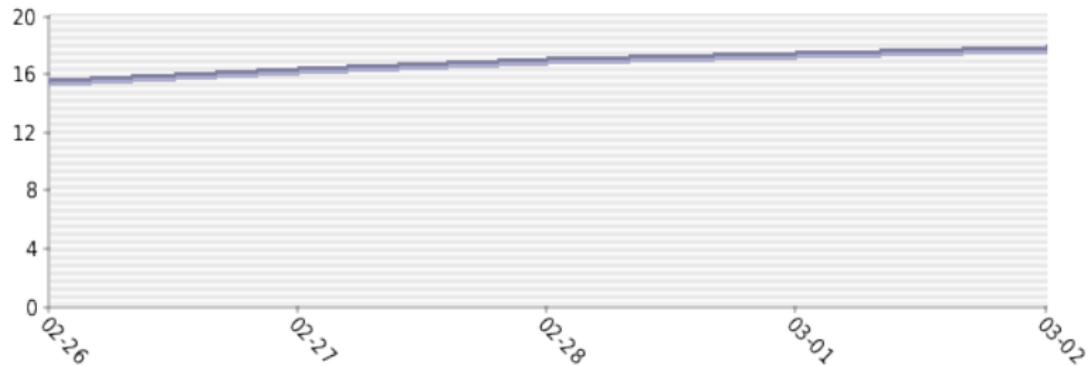
**Total Credit for project Ibercivis (2010)**



# Jarifa Statistics: GFlops for SETI@Home

Powered by  
Libchart

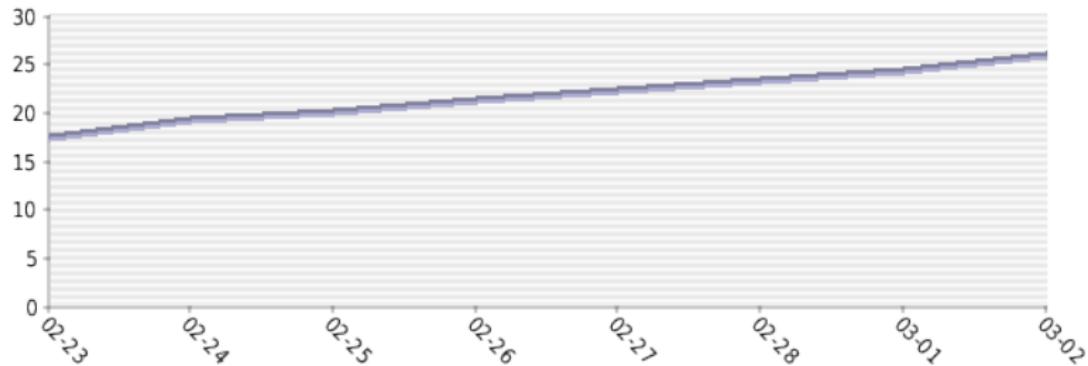
Total GFLOPS for project seti@home (2010)



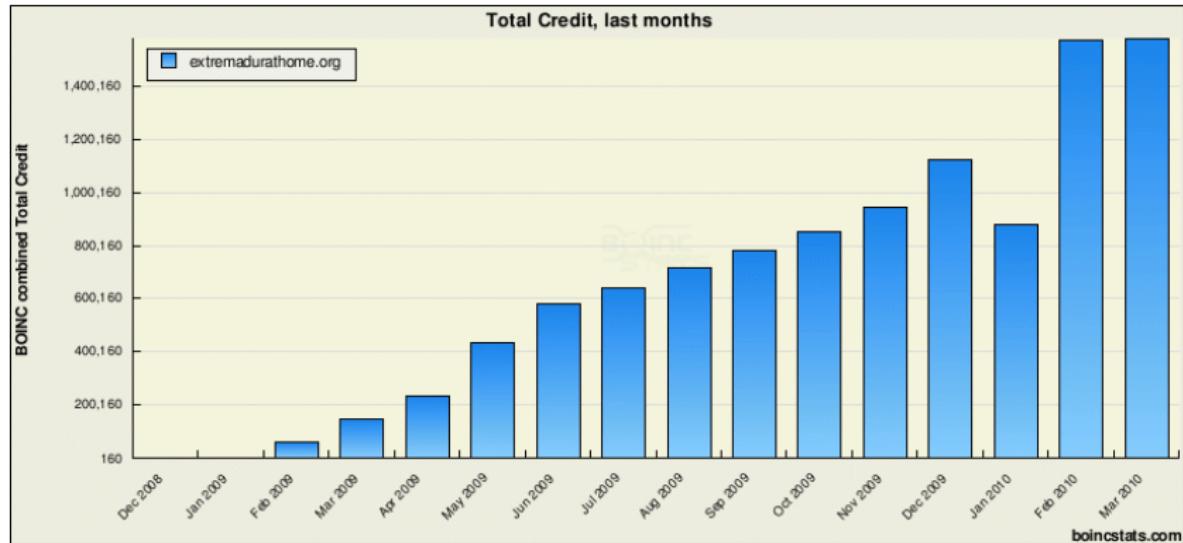
# Jarifa Statistics: GFlops for Ibercivis

Powered by  
Libchart

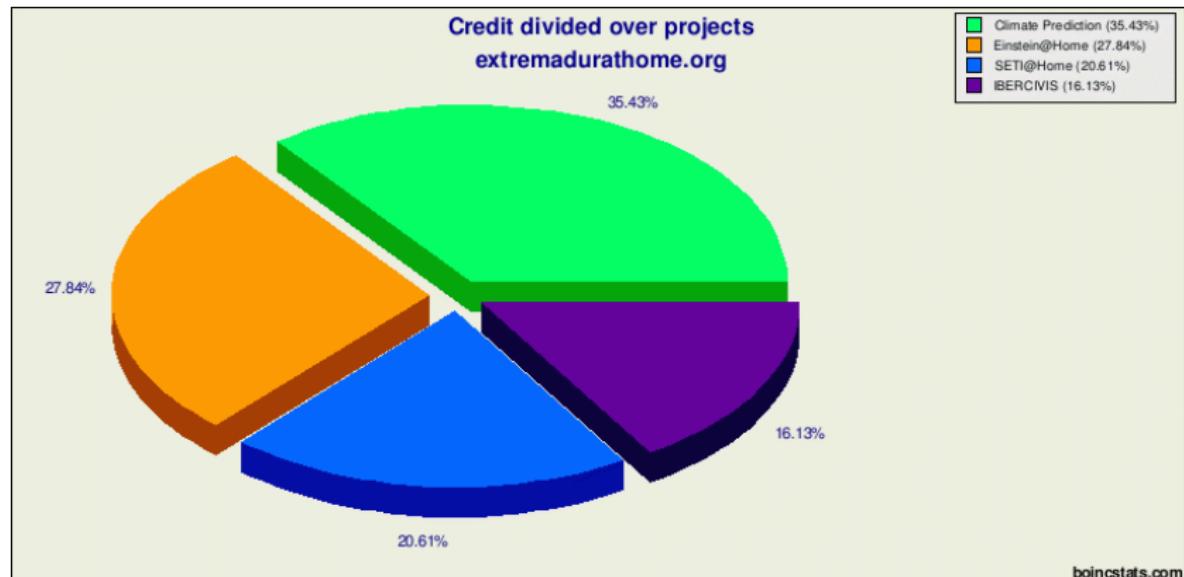
Total GFLOPS for project Ibercivis (2010)



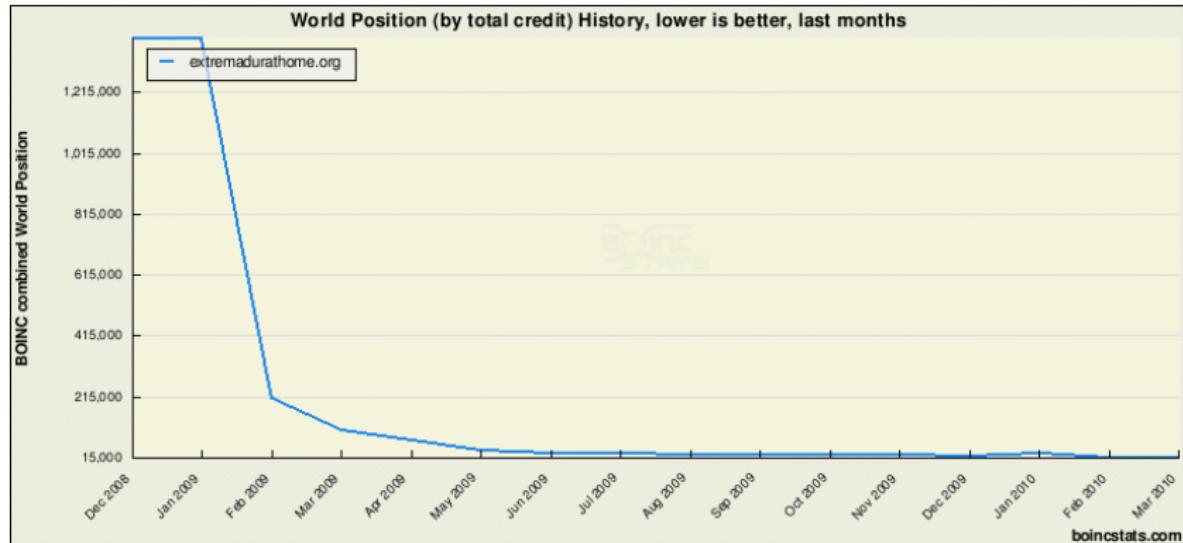
# Boincstats.com data



# Boincstats.com data



# Boincstats.com data



# 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

daniellg@unex.es

Icons from Tango Desktop project and Gnome Desktop (Creative Commons & GPL License)  
Except Facebook logo obtained from Wikimedia and Extremadurathome logo obtained from the project site.

