

The 10th BOINC Workshop

David P. Anderson

Space Sciences Lab
University of California, Berkeley



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1
100 WEEKS ON THE NEW YORK TIMES BESTSELLER LIST
THE MILLION-COPY HARDCOVER BESTSELLER

A BRIEF HISTORY OF



BOING!

1985

- Wisconsin → UC Berkeley
- Internet as backplane

1987

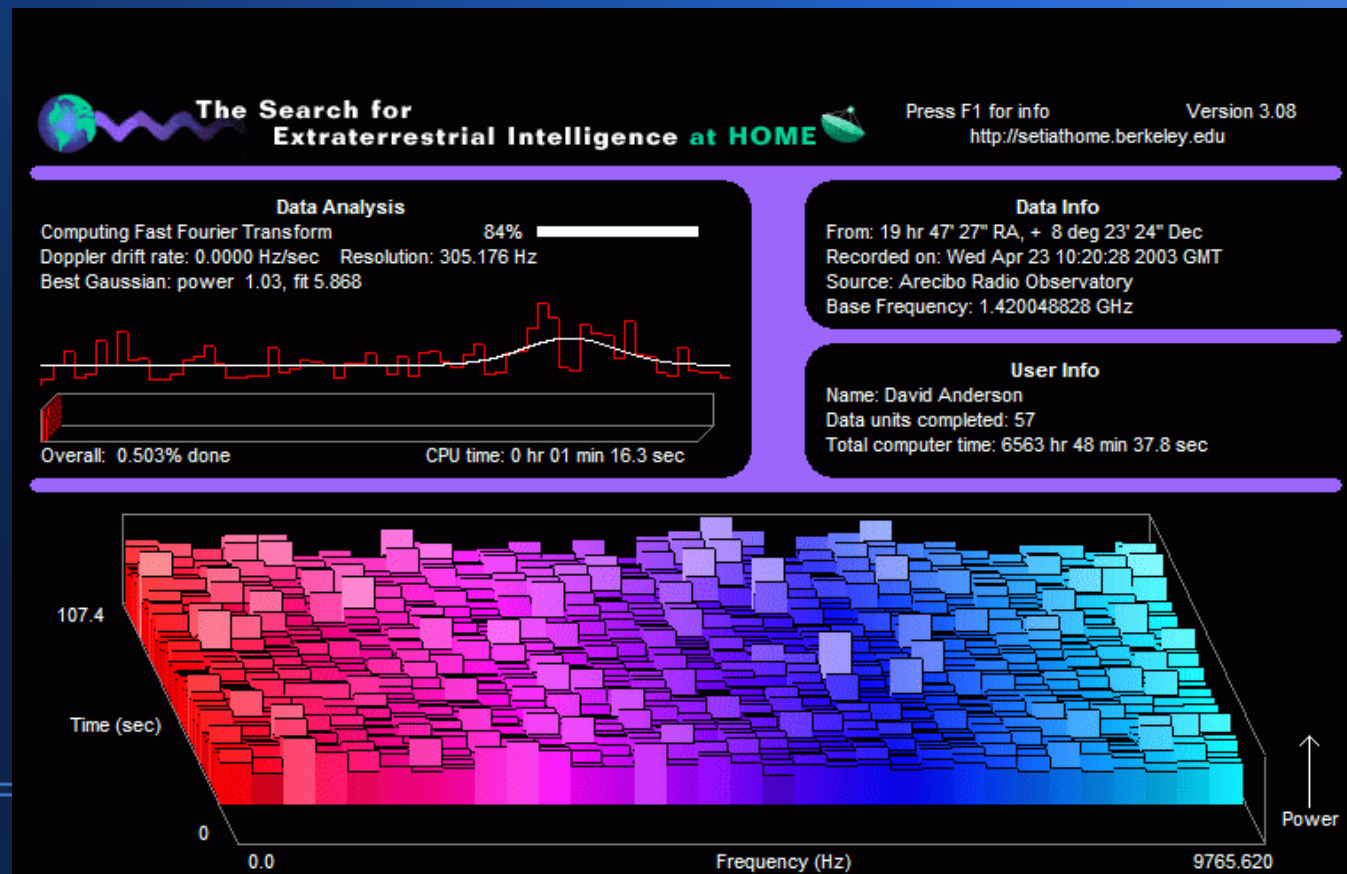
- Marionette

1992

- Industry

1995

- David Gedye: SETI@home idea



1998

- SETI@home development
 - Eric Korpela
 - Jeff Cobb
 - Matt Lebofsky

1999

- SETI@home launch

2000

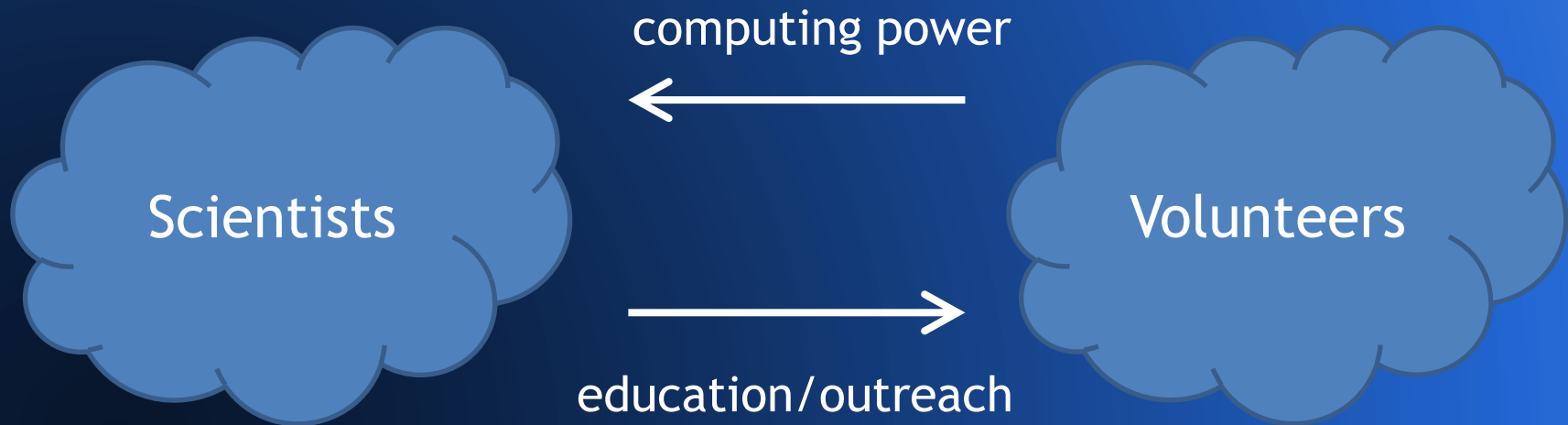
- Infrastructure issues
- United Devices

2001

- United Devices falling-out

2002

- ClimatePrediction.net: Myles Allen
- BOINC



2002

- Open source software
- Credit
- Replication and validation
- Client job buffer
- Code signing

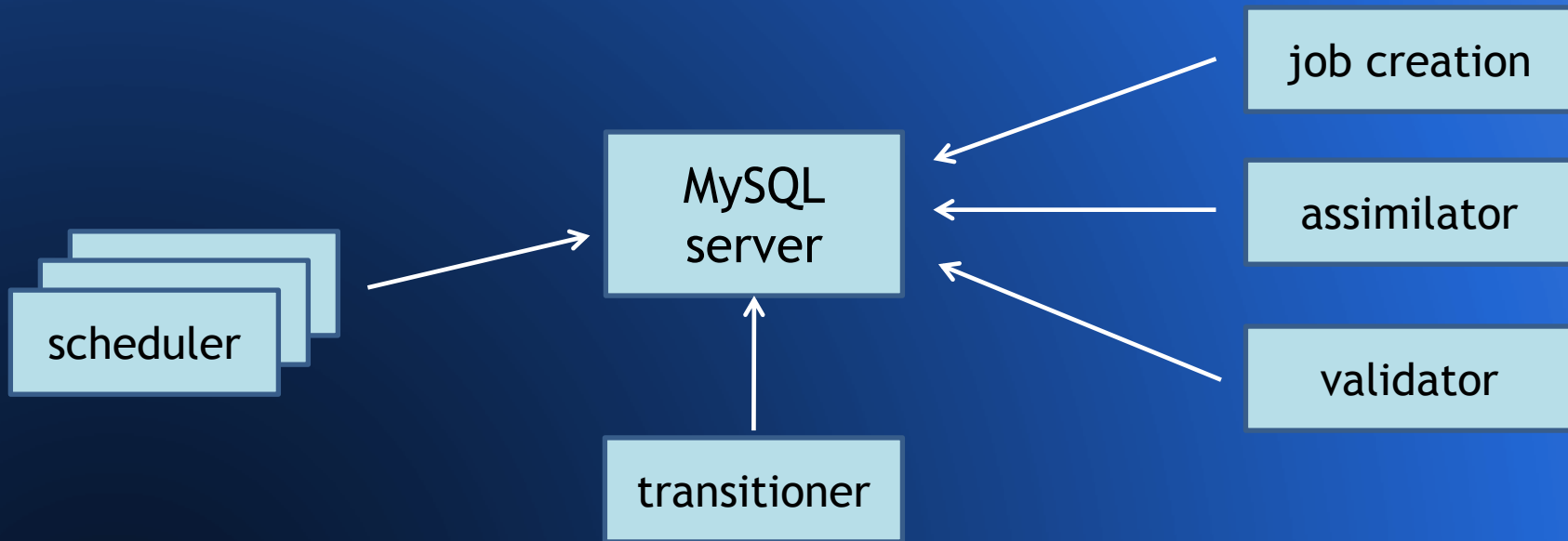
2002

- Hiram Clawson, Eric Heien
- NSF proposal
 - Mari Maeda, Kevin Thompson
- Visit Climateprediction
 - Carl Christensen, Tolu Aina
- Derrick Kondo
- Vijay Pande

2003

- UD lawsuit
- Undergrads, PHP code
- Karl Chen, Mr. Python
- Oct: LIGO, Bruce Allen
- Nov: CERN
 - Francois Grey, Ben Segal
- Nov: WCG kicks tires

2003



2004

- Rom Walton
- Charlie Fenton

2004

- Anonymous platform
- Separate GUI
- Cross-project ID and credit
- Preemptive scheduling
- Sticky files
- Upload/download hierarchies
- DB as buffer


2004


- Predictor@home, Michela Taufer
 - homogeneous redundancy
- SETI@home: Eric Korpela
- BURP: Janus Kristensen
- Climateprediction.net launch
- LHC@home launch

2004

setiathome

Data analysis

Computing Fast Fourier Transform 
Doppler drift rate 0.2366 Hz/sec Resolution 0.075 Hz
Best Gaussian power 1.33, fit 0.483, score 2.753



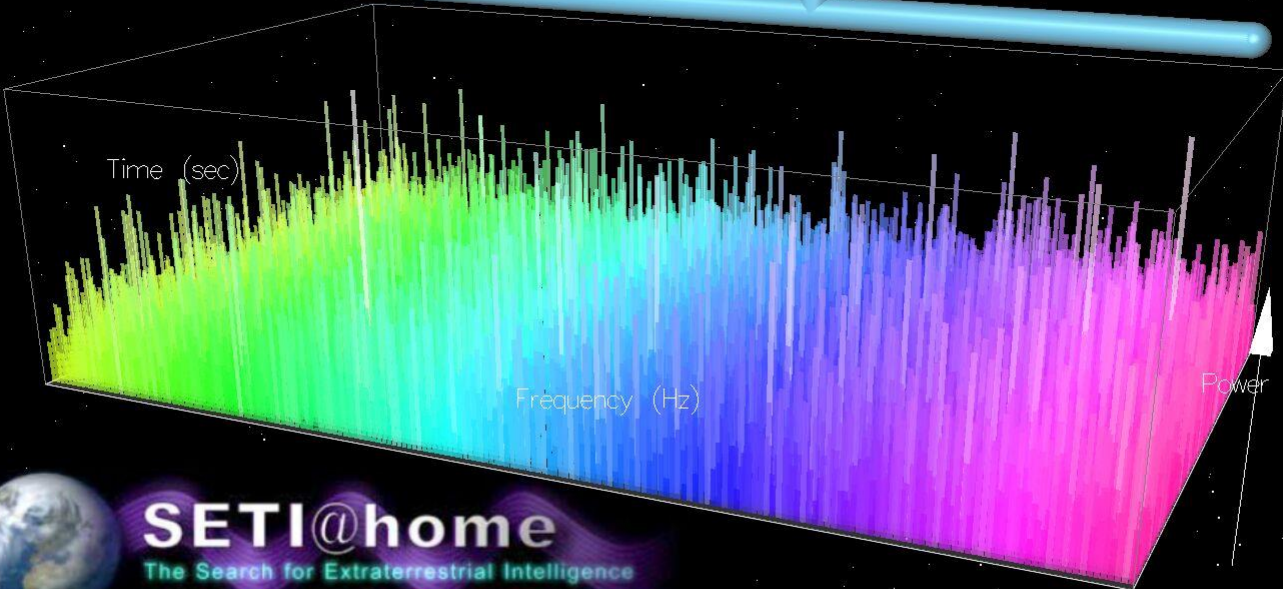
Overall 27.138% done CPU time: 5 min 25.31 sec.

Data info


From: 21 hr 57 51" RA, +19 deg 0' 7" Dec
Recorded on: Sat Dec 25 20:11:32 2004
Base frequency: 1.420429688 GHz

User info

Name: David Anderson
Team:
Total credit: 0.00



Time (sec)
Frequency (Hz)
Power



SETI@home
The Search for Extraterrestrial Intelligence

Start | boincmg... | FreeCell ... | 2 trans... | DevGuru... | Request ... | Mozilla | BOINC a... | BOINC | Clipboar... | setiath... | 64 2:57 PM

2004

- Supercomputer 04 talk
- Matt Blumberg, account manager design

2005

- Einstein@home
 - Reinhard Prix, Bernd Machenschalk, Oliver Bock
- Primegrid
 - Rytis Slatkevičius
- Rosetta@home
- IBM World Community Grid
 - Kevin Reed

2005

- 1st BOINC workshop at CERN

2005

- Translatable web code
- Mac installer and GUI
- Libcurl (HTTP)
- BOINC Alpha test project

2006

- Proteins@home (École Polytechnique, Paris)
- Spinhenge (U. Bielefeld)
- QMC@home (U. Munster)
- Tanpaku (Tokyo U. of Science)
- SIMAP (TU Munich)
- Malariaccontrol.net (Swiss Tropical Inst.)
- Reisel Sieve
- Chess960
- CPDN “Climate Change”; BBC documentary

2006

- SZTAKI desktop grid
 - Adam Kornafeld, Attila Marosi, Jozsef Kovacs
 - DC-API, 3GBridge, genwrapper, X.509 certs, VM wrapper

2006

- BoincStats
 - Willy de Zutter
- BoincStats Account Manager (BAM!)
- GridRepublic

2006

- Graphics in separate app
- BOINC wrapper
- Preferences code rewrite
 - Christian Beer
- BOINC Manager simple view
- Account-based sandboxing
- Skype-based volunteer help

2006

- User poll
 - 92% male; 50-ish; technical
 - BOINC is unpopular

2007

- ABC@home (Leiden U.)
- Leiden Classical
- Lattice (U. Maryland)
- SHA-1 Collision Search (Graz U. Tech)
- Superlink@Technion: Mark Silberstein
- Yoyo@home: Uwe Beckert
- Enigma@home

2007

- Publicity: try to use volunteers
- Charity Engine: Mark McAndrew
- Berkeley@home

2007

- Trac, Subversion
- BOINC-Wide Teams
- Client emulator
- Bossa
 - Stardust@home
- Bolt

2008

- AQUA@home: D-Wave systems; Kamran Karimi
- GPUGrid.net: Gianni di Fabriitis
- Orbit@home: Planetary Science Inst.
- Quake Catcher Network (Stanford)

Jan: PetaFLOPS barrier broken

2008

- GPU support
 - client: detection, scheduling
 - scheduler RPC
 - scheduler
- Multi-core apps
- Plan class mechanism
- Adaptive replication

2008

- Jarifa
 - Daniel Gonzales

2009

- NSF@home (Cal State Fullerton)
- VTU@home (Vilnius Tech, Lithuania)
- Cosmology@home (U. of Illinois)
- Virtual Prairie (U. of Houston)

2009

- Workshop at Academia Sinica (Taipei)
- Progress Thru Processors
- BoincTasks: Fred Melgert
- Pootle-based translation system
- Motivation studies by Oded Nov (NYU)

2010

- eOn (U. Texas)
- CAS@home: Wenjing Wu

2010

- Trilce Estrada: server emulator
- Sony puts BOINC/WCG on VAIO computers
- BOINC packages for Debian: Gianfranco Costamagna
- nanoHub: Michael McLennan
- Einstein@home pulsar discovery
- BOINC tutorial at SC10

2010

- Notices
- New system for runtime estimation, credit

2011

- DistRTGen
- Surveill@home
- Mersenne@home
- U. of Westminster campus grid

2011

- Taipei, Beijing hackfests
- Brazil junket

2011

- Apps in virtual machines
 - vboxwrapper
 - support for large files

2012

- SAT@home (Russian Acad. Sci.)
- Fightmalaria@home (U. College Dublin)
- Oproject@home
- Volpex (U. Houston)

2012

- Android
 - Jeff Eastlack (Freescale)
 - Pavel Michalec: AndroBOINC
 - Mateusz Szpakowski: NativeBOINC
 - Google Summer of Code
 - Joachim Fritszch

2012

- Condor/OSG collaboration
 - Miron Livny
 - remote file management, job submission
- Git

2013

- Asteroids@home (Charles U., Prague)
- Subset@home (U. N. Dakota)
- RNA World (Rechenkraft.net)

2013

- July: BOINC/Android released
- BOINC installer includes VirtualBox
- Scheduler reimplemented (score-based)

2014

- Convector (Czech Tech U.)
- ATLAS@home (CERN)
- Bitcoin Utopia
- GridOctane (India)

2014

- Ripple support of WCG
- HTC: Power to Give
- Samsung: Power Sleep

.The BOINCosphere

organizations

GridRepublic

Charity Engine
GridOctane
Bitcoin Utopia

Samsung
HTC
Intel, IBM

testers

add-on
developers

help
agents

Projects:
academic,
hobby

PC/phone
owners

SZTAKI,
TACC,
HUBzero

stats
sites

volunteers

Me, Rom,
Charlie

porters

CS
research



Reflections on software: things we did right

- Good factorization and good interfaces
- Server architecture
- Mechanisms that provide generality
 - account manager, anonymous platform, plan class
- Emulators
- Avoided software fossilization

Reflections on software: things we need to change

- Coprocessor model
- Preferences

Reflections on software: things we should have done differently

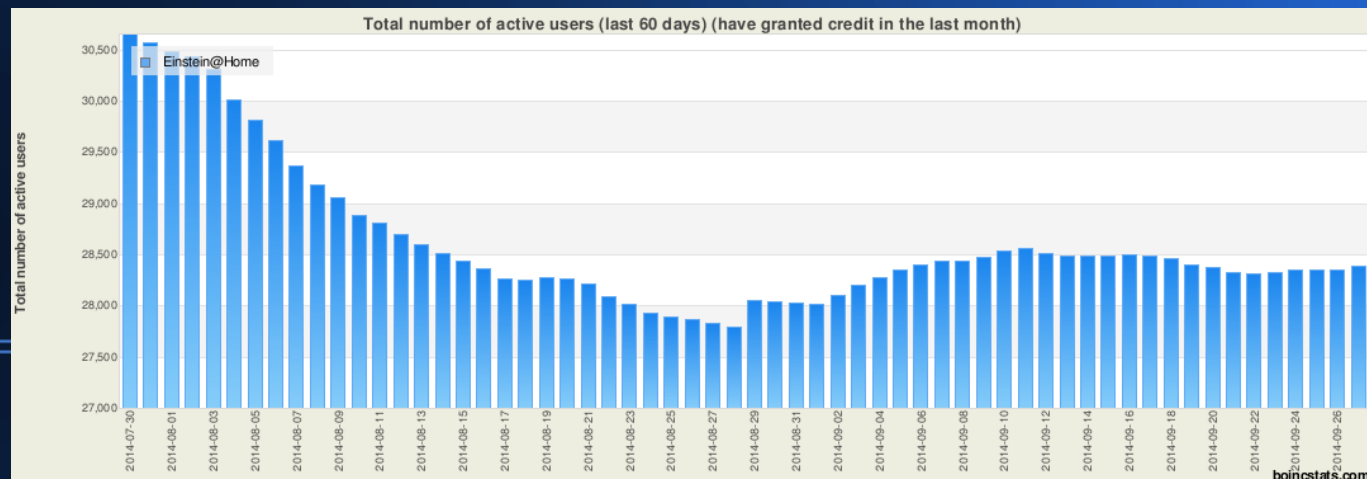
- Decentralized model
- Complexity of volunteer interfaces
- Complexity of server and job submission

Reflections on project management

- Personalities
- Resource allocation
- Autocracy
- Release management
- Documentation

Goals not achieved

- Widespread usage by scientists
- Publicity and outreach
- Volunteer population growth
- Interest from Computer Science
- Interest from funding agencies



My failures

- Overconfidence
- Didn't know my audience
- Personality issues

My experience

- Negatives
- Positives



Joining the HTC mainstream

- Texas Advanced Computing Center (TACC)
- XSEDE
- nanoHUB/HUBzero

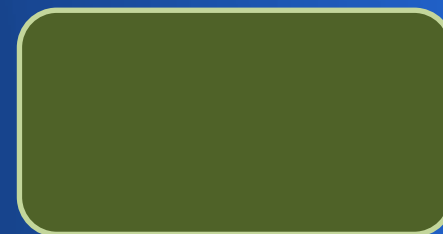
Volunteer interface



I want to support
European cancer research

Science@home

projects



Volunteer populations

- Female; young; non-technical
- Bitcoin mining GPUs
- PC game machines
 - Steam
- Mobile