BOINC

Volunteer Computing at CERN

Pre-GDB 11/11-2014

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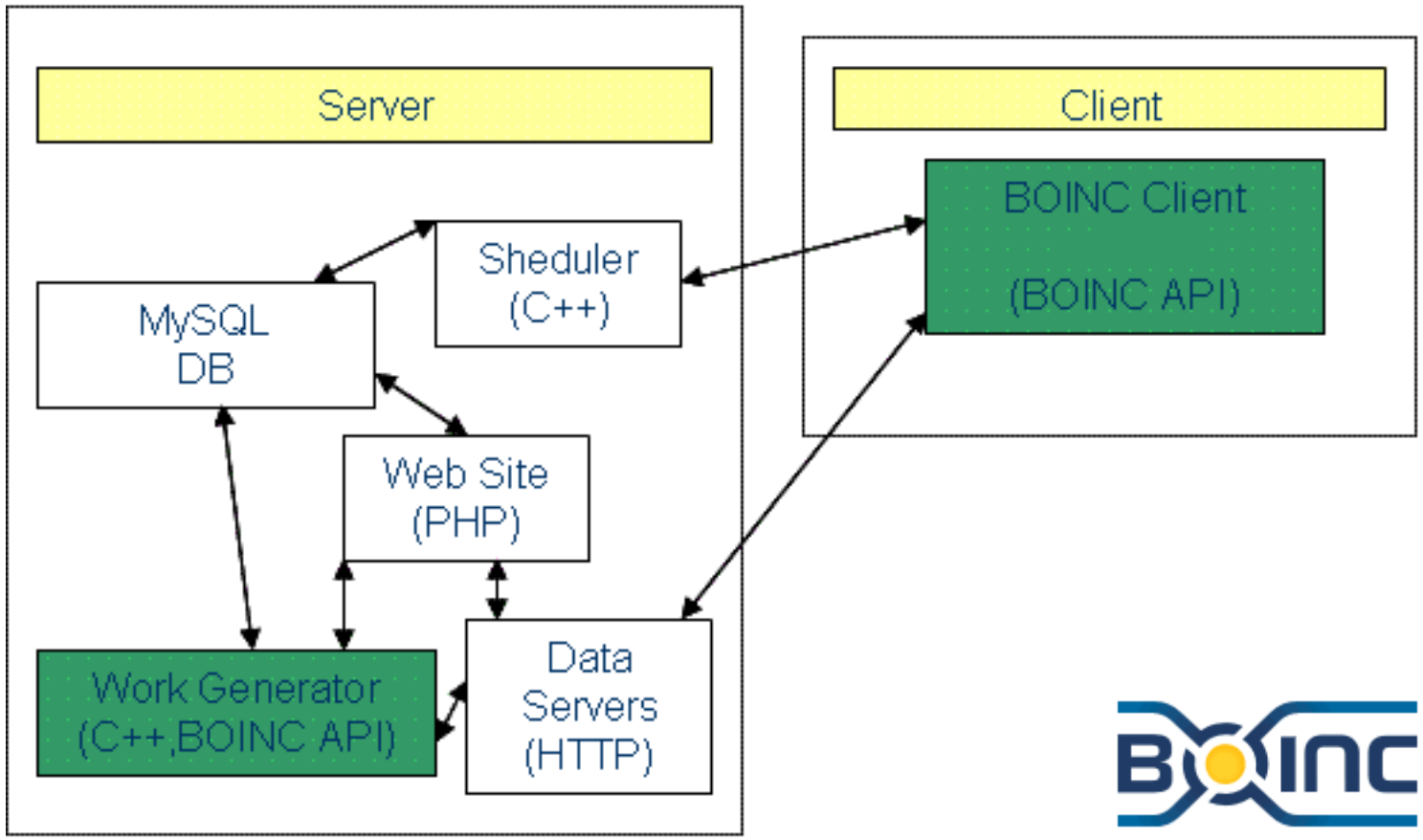
Why Volunteer Computing?

Target	Deployment	Benefit
Volunteers	Uncoordinated, opportunistic	• Get additional, “free” compute cycles • Engage with communities outside HEP: **outreach** and **publicity** for HEP and science
Institute desktops	Coordinated, opportunistic	• Get additional, “free” compute cycles
Small to midsize server farms	Coordinated, pledged	• Easier to deploy than complete Grid middleware

BOINC system architecture - 1



BOINC Compute Power

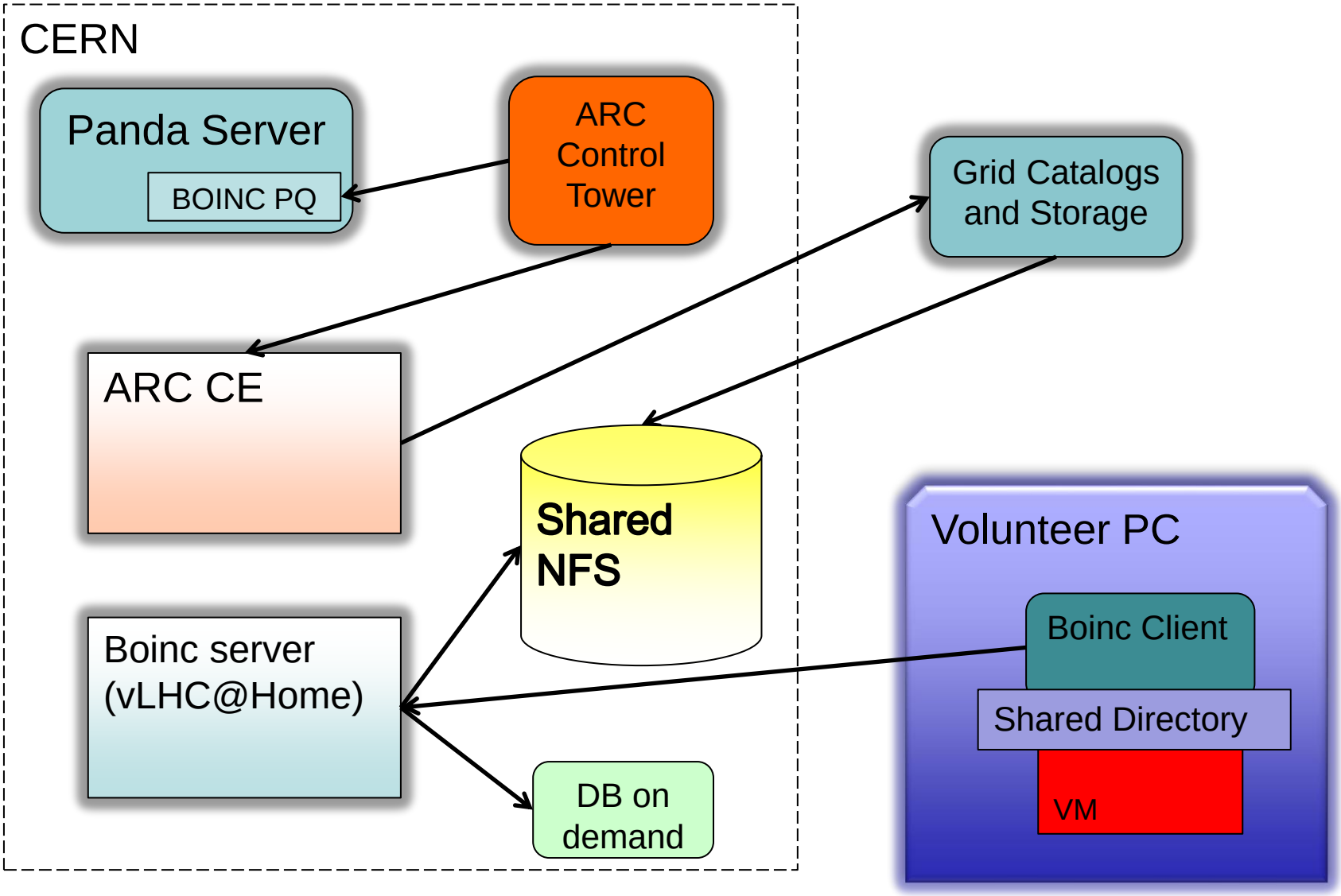
Project	Average power
SETI@home	653 TFlops
Einstein@home	637 TFlops
World Community Grid	421 TFlops
LHC@home -classic	31 TFlops
Virtual LHC@home	2.6 TFlops

According to BOINCstats.com 10.11.2014

Acknowledgements

- BOINC service: Pete Jones, Tomi Asp, Alvaro Gonzalez
- Also Miguel Marquina, Helge Meinhard, Manuel Guijarro, Ignacio Reguero
- Test4Theory: Ben Segal, Peter Skands, Jakob Blumer, Ioannis Charalampidis, Artem Harutyunyan, Predrag Buncic, Daniel Lombrana Gonzalez, Francois Grey et al
- Sixtrack: Eric McIntosh, Riccardo de Maria, Massimo Giovannozi, Igor Zacharov et al
- ATLAS: David Cameron, Andrej Filipic, Eric Lancon, Wenjing Wu
- CMS: Laurence Field, Hendrik Borras, Daniele Spiga, Hassan Riahi
- LHCb: Federico Stagni, Joao Medeiros et al
- BOINC: David Anderson, Rom Walton
- All our IT colleagues offering a layered service, DB on Demand, Openstack, Puppet, AFS, NFS filers, Linux, network... :-)

Current ATLAS@Home Setup

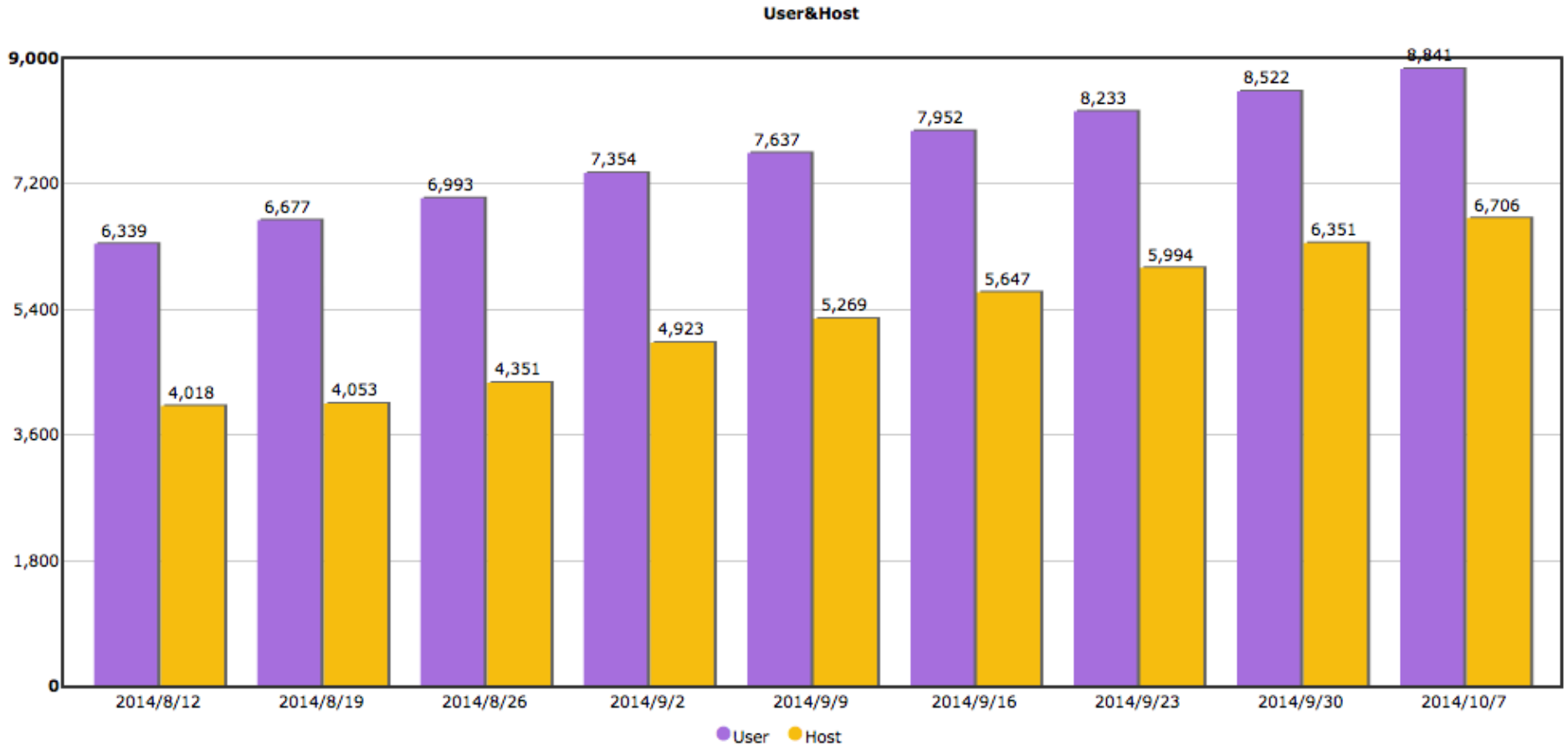


Boinc jobs

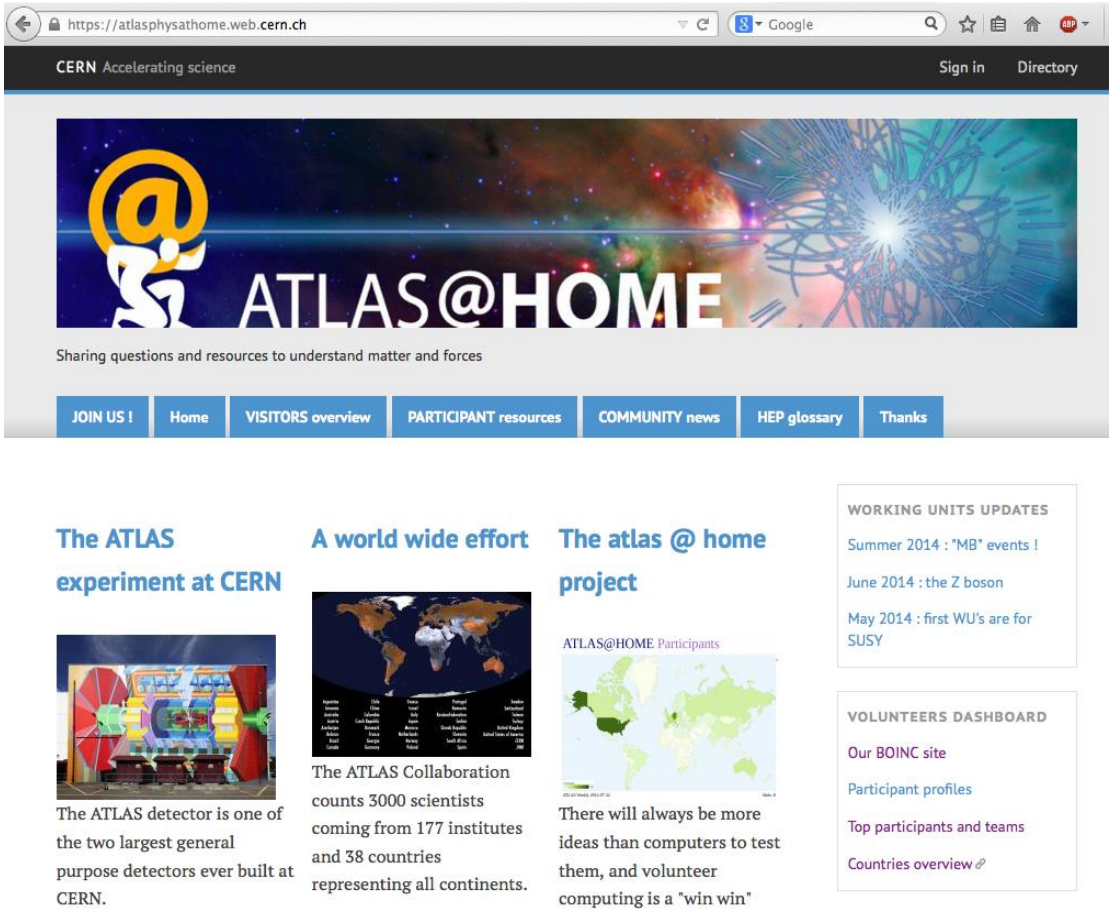
- Real simulation tasks
  - mc12_8TeV.117079.PowhegPythia_P2011C_ttbar_nonallhad_mtt_2000p.simul.e2940_s1773
  - Full athena jobs
  - 50 events/job
- Runs in CERNVM with pre-cached software
- But some data still needs to be downloaded at runtime
  - Conditions data from squid/frontier
- Image is 1.1GB (500MB compressed) and downloaded only once
- Input files tarball (data file + small scripts) is 1-100MB
- Output is ~100MB
- VM memory is now 2GB (was 1GB initially, but now more complex jobs)
- Job takes a few hours on fast (single) core
- Validation
  - Per work unit, that correct output is produced (just that file exists, the content is not checked)
  - Physics validation comparing results to regular Grid task

Volunteer growth

Currently >10000 volunteers
300 new volunteers/week



ATLAS@Home public outreach page



- https://atlasphysathome.cern.ch
- Designed by Claire using Drupal
- Entry point for the public to find out what they are contributing to
- Many links to existing outreach pages