

# HPC @ AIMS



Jan Groenewald, AIMS South Africa IT Manager

Workshop on High Performance Computing (HPC) Architecture  
and Applications in the ICTP, Trieste, October 2013

# Jan Groenewald

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 [launchpad.net/~jan-aims](https://launchpad.net/~jan-aims) (aims-desktop)

 [bitbucket.org/pipedream](https://bitbucket.org/pipedream) (IT scripts, academic)

IRC: pipedream on [irc.atrum.org](http://irc.atrum.org) #clug  
or [irc.freenode.net](http://irc.freenode.net) #sagemath #launchpad

# My HPC history

- 2003 BSc (Hons) Mathematics and Computer Science
- 2003-13 Masters Students: Focus on efficiency & coding
- 2004 Scientific Clustering Applications Workshop, CapeTown
- 2005 High Performance Computing in Linux Clusters, Ghana
- 2006 OpenMosix deployed at AIMS
- 2008-13 Researchers using dsh@AIMS to run parameters
- 2009 HPC Winter School (AIMS/CHPC)
- 2010 ASESMA (ICTP, running codes at CHPC)
- 2010-11 Concurrent Scientific Computing (Postgraduate)
- 2010-13 Assist researchers using (free) HPC resources at
  - CHPC
  - SA-GRID
  - UCT Computational Biology Group
  - Harvard Medical School
- 2012 Advanced School on Scientific Software Development
- 2012 Increased national bandwidth 6Mb->84Mb 20avg65max
- 2013 HPC Architecture and Applications in the ICTP





# AIMS

African Institute for Mathematical Sciences  
(South Africa)

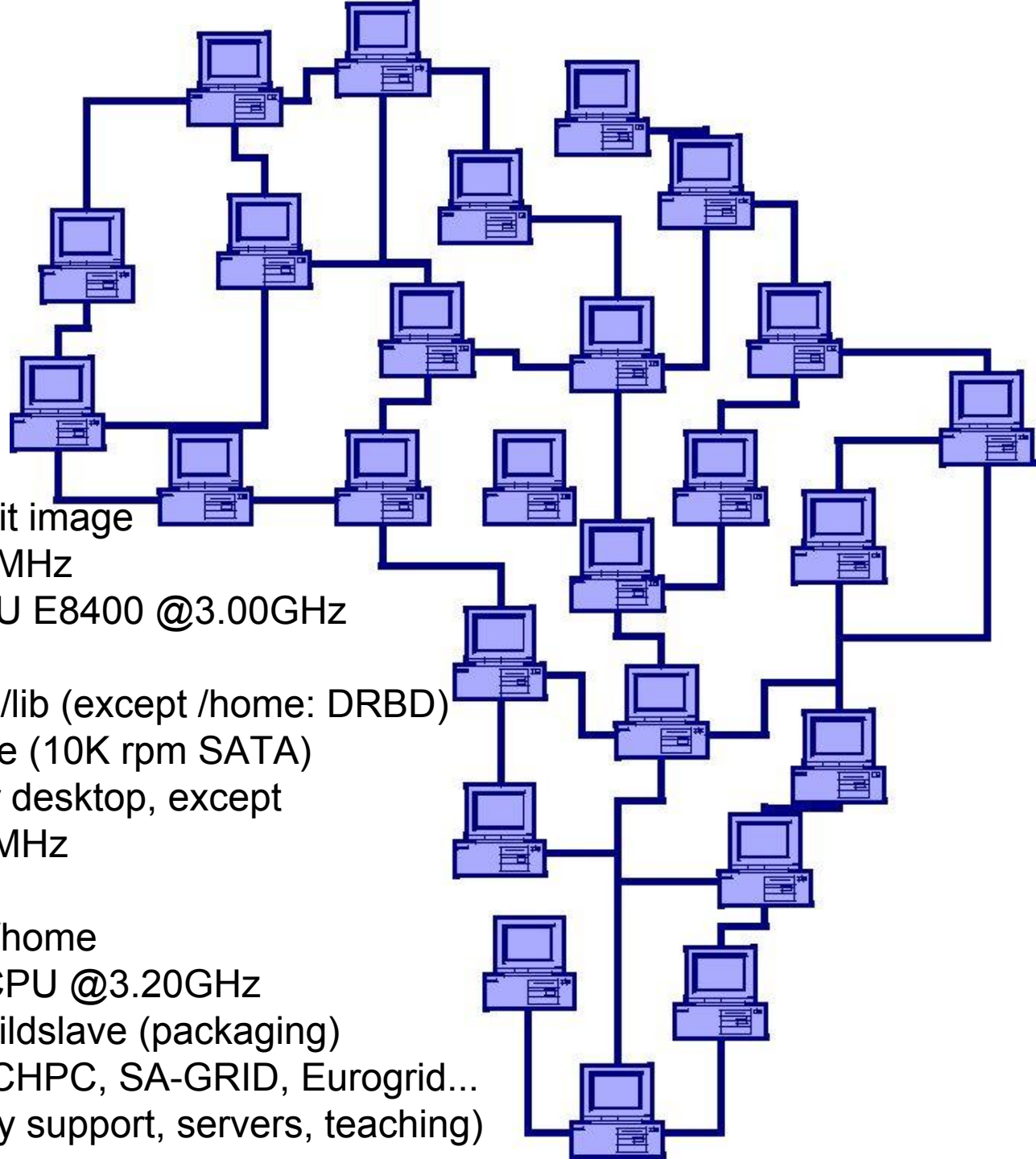
[www.aims.ac.za](http://www.aims.ac.za)

Postgraduate, Research, Teacher training

*Senegal, Ghana, Cameroon, Tanzania*

<http://www.nature.com/news/education-africa-s-counting-house-1.11757>





For computational work:

- 130 desktops
  - Ubuntu 12.04.3 64bit image
  - 2x2=4GB RAM 800MHz
  - Intel Core2 Duo CPU E8400 @3.00GHz
  - 100Mb/s
  - fat client: local /usr, /lib (except /home: DRBD)
  - 6.1GB scratch space (10K rpm SATA)
- if needed, have 1 similar desktop, except
  - 2x4=8G RAM 1600MHz
  - RAID1
  - 340G free of 380G /home
  - Intel Core i5-3470 CPU @3.20GHz
- 1 [www.sagemath.org](http://www.sagemath.org) buildslave (packaging)
- (inter)national facilities: CHPC, SA-GRID, Eurogrid...
- 3x IT staff (approximately support, servers, teaching)

# Future

- Integrate concepts with teaching
  - Best Practices
- Assist with algorithms & implementation
  - Best Practices
- Single local high memory machine? ~124GB
  - Prototypes
- Facilitate using (inter)national resources
  - Bureaucracy
  - Uptime
  - Different job management & monitoring systems
  - Moving data, local visualisation (bandwidth)





How the customer explained it



How the project leader understood it



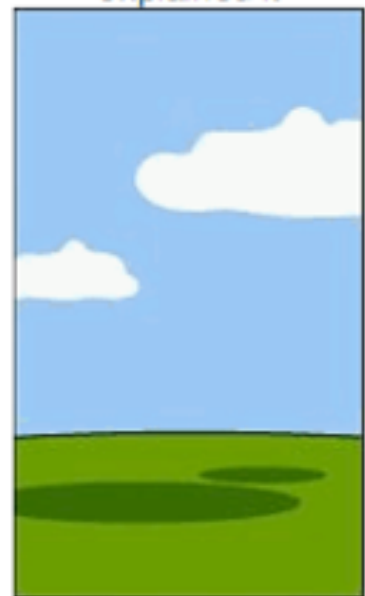
How the engineer designed it



How the programmer wrote it



How the sales executive described it



How the project was documented



What operations installed



How the customer was billed



How the helpdesk supported it



What the customer really needed

# **The End**

Questions & Suggestions?