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Facultad de Ingeniería

Grid Colombia's review

John Sanabria
Universidad del Valle
Cali, Colombia



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Agenda

- Grid Colombia – ... 2010
- Grid Colombia – 2011 the year of consolidation
- What coming next?
 - Infrastructure and problems to be tackled
- Final words



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Grid Colombia's goals

- Grid Colombia has been conceived as a project to support Colombia's development on science and technology
 - Orchestrate distributed resources
 - Support the integration of HTC and HPC platforms in the research processes
 - Build a society of knowledge

Grid Colombia 2010



Wednesday, March 21, 2012

OSG - All Hands Meeting 2012

Grid Colombia 2010



Wednesday, March 21, 2012

OSG - All Hands Meeting 2012

Grid Colombia 2011



Wednesday, March 21, 2012

OSG - All Hands Meeting 2012

From there to here

- Grid Colombia at the beginning was only 11 institutions from five regions
- Now, we are 24 institutions from six regions
- An organizational model was proposed and discussed by consensus



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From there to here

- Grid Colombia was only 11 institutions from five regions
- Now, we are **24** institutions from **six** regions
- An organizational model is operating

Pioneers



Pioneers and new members



Regional nodes



Regional nodes





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Colombia has an operational Grid

- We have integrated resources scattered across different regions of Colombia
- Every node is evaluated and ranked
 1. Cluster installation
 2. Installation and configuration of its local CE
 3. Pass CE local tests
 4. Pass CE remote tests
 5. Pass regional orchestration tests
 6. Pass national orchestration tests
 7. VO integration



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Colombia has an operational Grid

- Additional info has been also tracked
 - Number of cores per institution
 - Participation in GC courses
 - Delivery of reports

Colombia has an operational Grid

- First column indicates level that the institution achieved, second column nodes per institution

Centro	Pontificia Universidad Javeriana	7	15	SI	SI	SI	SI	SI	SI	SI	SI	SI
	Universidad de los Andes	6	5	SI	SI	SI	SI	SI	SI	NO	SI	
	Universidad Católica	7	16	SI	SI	SI	SI	SI	SI	SI	SI	SI
	Universidad Nacional	3	5	SI	SI	SI	SI	NO	NO	NO	NO	
	Universidad Antonio Nariño	3	5	SI	SI	SI	SI	NO	N/A	NO	SI	
	Universidad Distrital	7	5	SI	SI	SI	SI	SI	N/A	SI	NO	
	Politécnico Grancolombiano	1	5	NO	SI	SI	NO	SI	N/A	NO	NO	

Colombia has an operational Grid

- First column indicates level that the institution achieved, second column nodes per institution

Sur Occidente	Universidad del Valle	6	5	SI	SI	SI	SI	SI	SI	SI	SI	NO
	Pontificia Universidad Javeriana – Cali	6	5	SI	SI	SI	SI	SI	SI	SI	NO	NO
	Universidad Autónoma del Occidente	3	5	NO	SI	NO	NO	NO	N/A	NO	NO	NO

Colombia has an operational Grid

- First column indicates level that the institution achieved, second column nodes per institution

Norte	Universidad del Norte	7	6	SI	SI	SI	SI	SI	SI	SI	SI
	Universidad del Atlántico	6	6	SI	SI	SI	SI	SI	SI	SI	SI
	Universidad Autónoma del Caribe	7	5	NO	SI	SI	SI	SI	N/A	SI	SI
	Universidad Tecnológica de Bolívar	7	12	NO	SI	NO	NO	SI	N/A	SI	NO

Colombia has an operational Grid

- First column indicates level that the institution achieved, second column nodes per institution

Nor Occidental	Universidad Pontificia Bolivariana	7	16	SI	SI	SI	SI	SI	SI	SI	SI	SI
	Universidad Autónoma de Manizales	7	5	SI	SI	SI	SI	SI	N/A	SI	SI	
	Universidad de Caldas	7	5	SI	SI	SI	SI	SI	N/A	SI	SI	
	Universidad de Medellín	6	80	SI	SI	SI	SI	SI	N/A	SI	NO	
	Universidad Tecnológica de Pereira	3	5	NO	SI	SI	SI	SI	N/A	NO	NO	

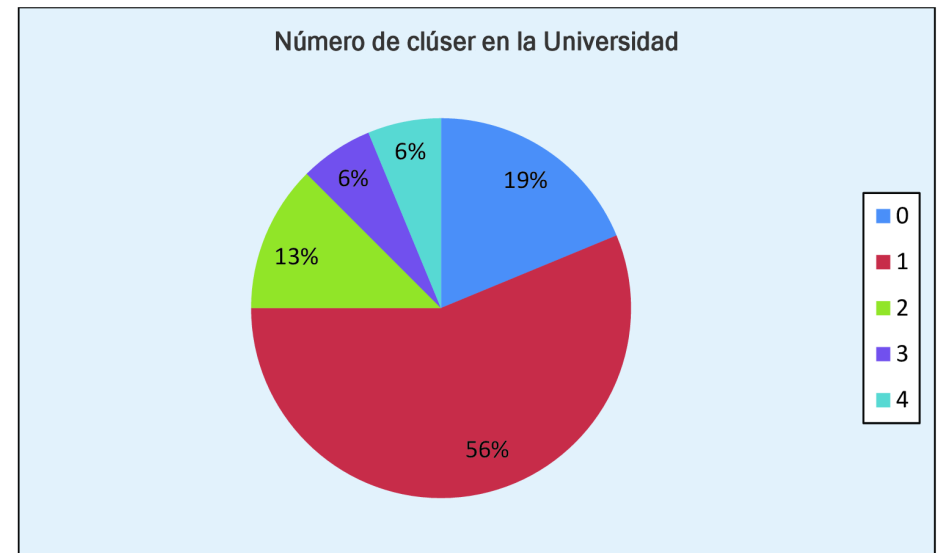
Colombia has an operational Grid

- First column indicates level that the institution achieved, second column nodes per institution

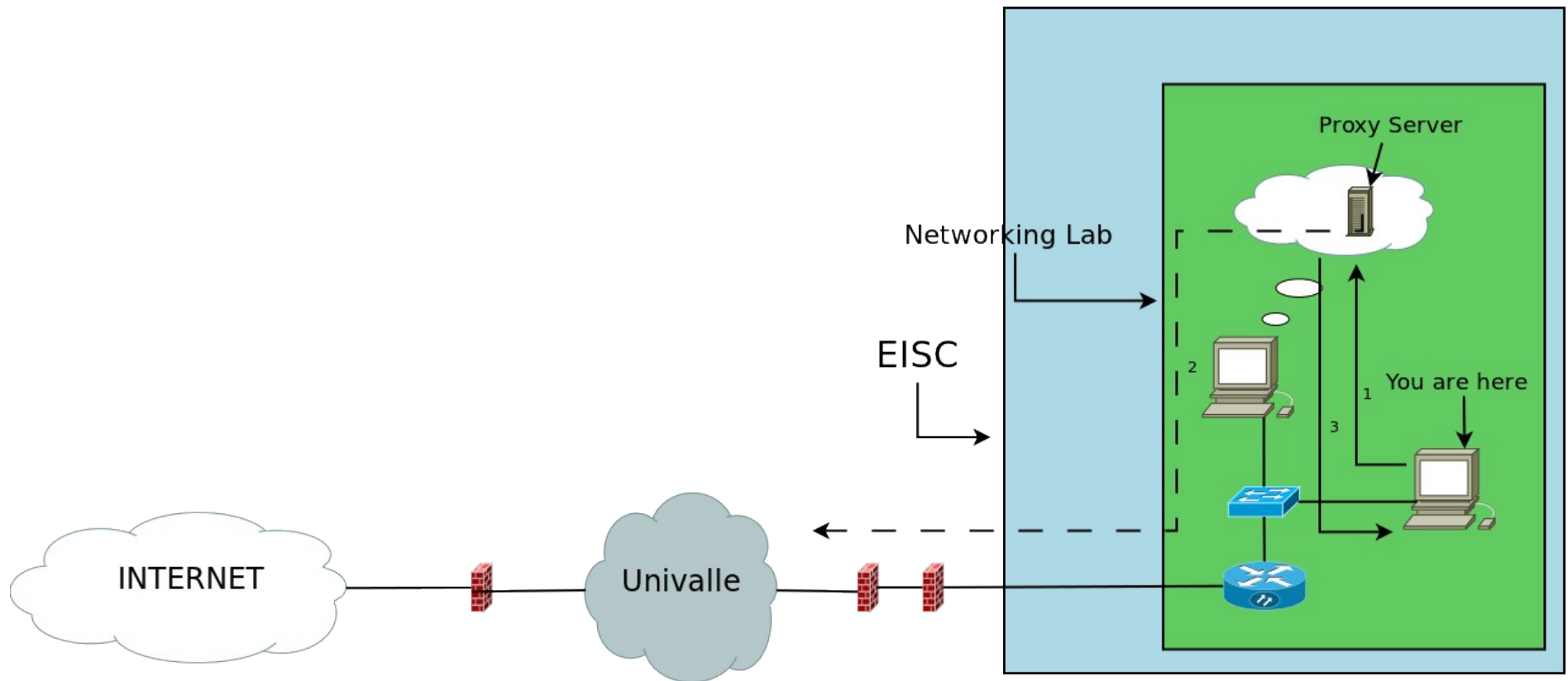
Nor Oriental	Universidad Industrial de Santander	7	5	SI	SI	SI	SI	SI	NO	SI	SI
	Universidad Autónoma de Bucaramanga	3	5	SI	SI	SI	SI	SI	SI	NO	SI
	Universidad Cooperativa de Colombia	4	N/R	NO	SI	NO	NO	NO	N/A	NO	NO

Colombia has an operational Grid

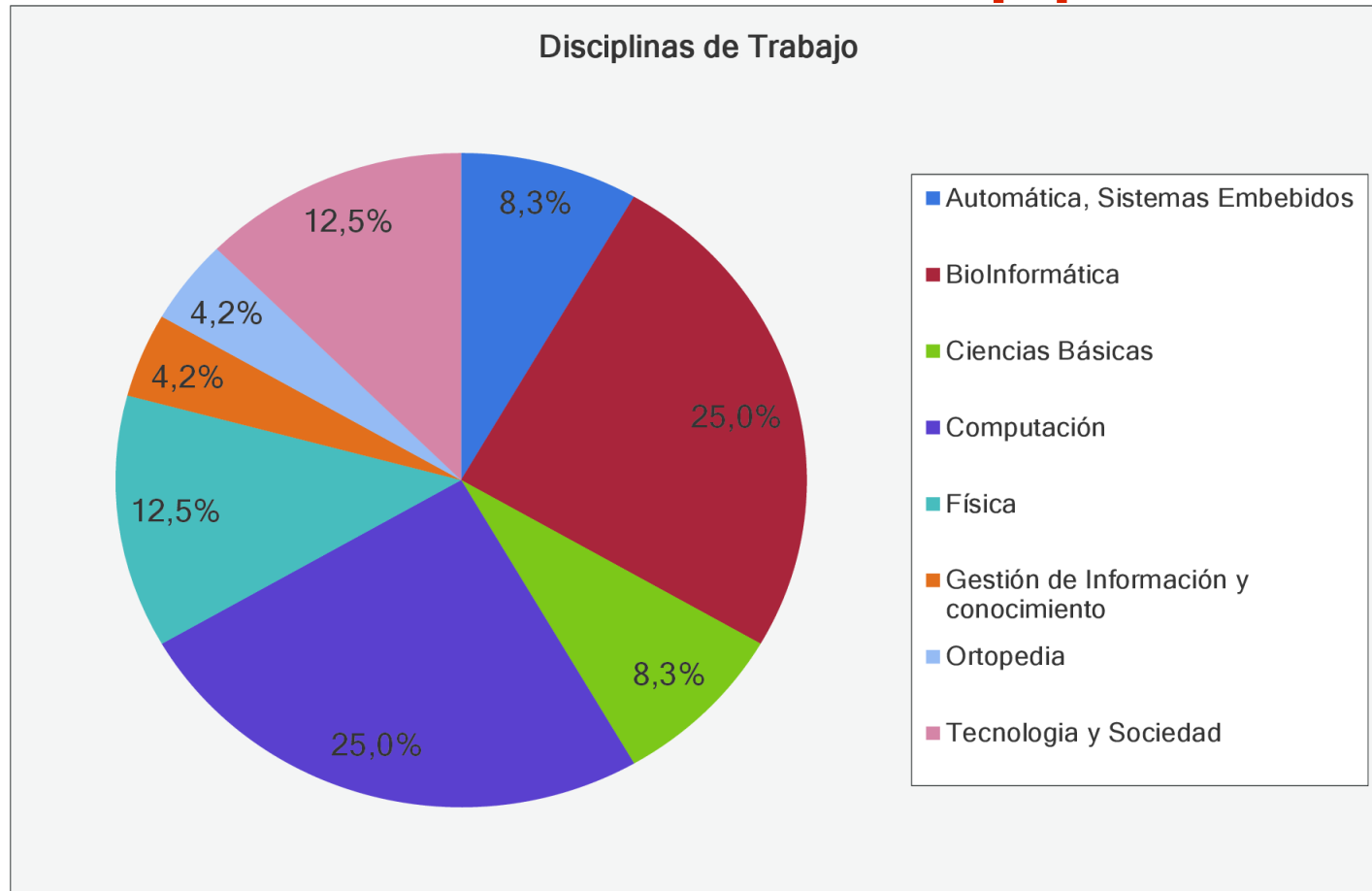
- 68% of institutions are in either sixth or seventh level
- More than 200 cores are deployed in a badly loosely coupled way
- All institutions have reached at least the **third level**



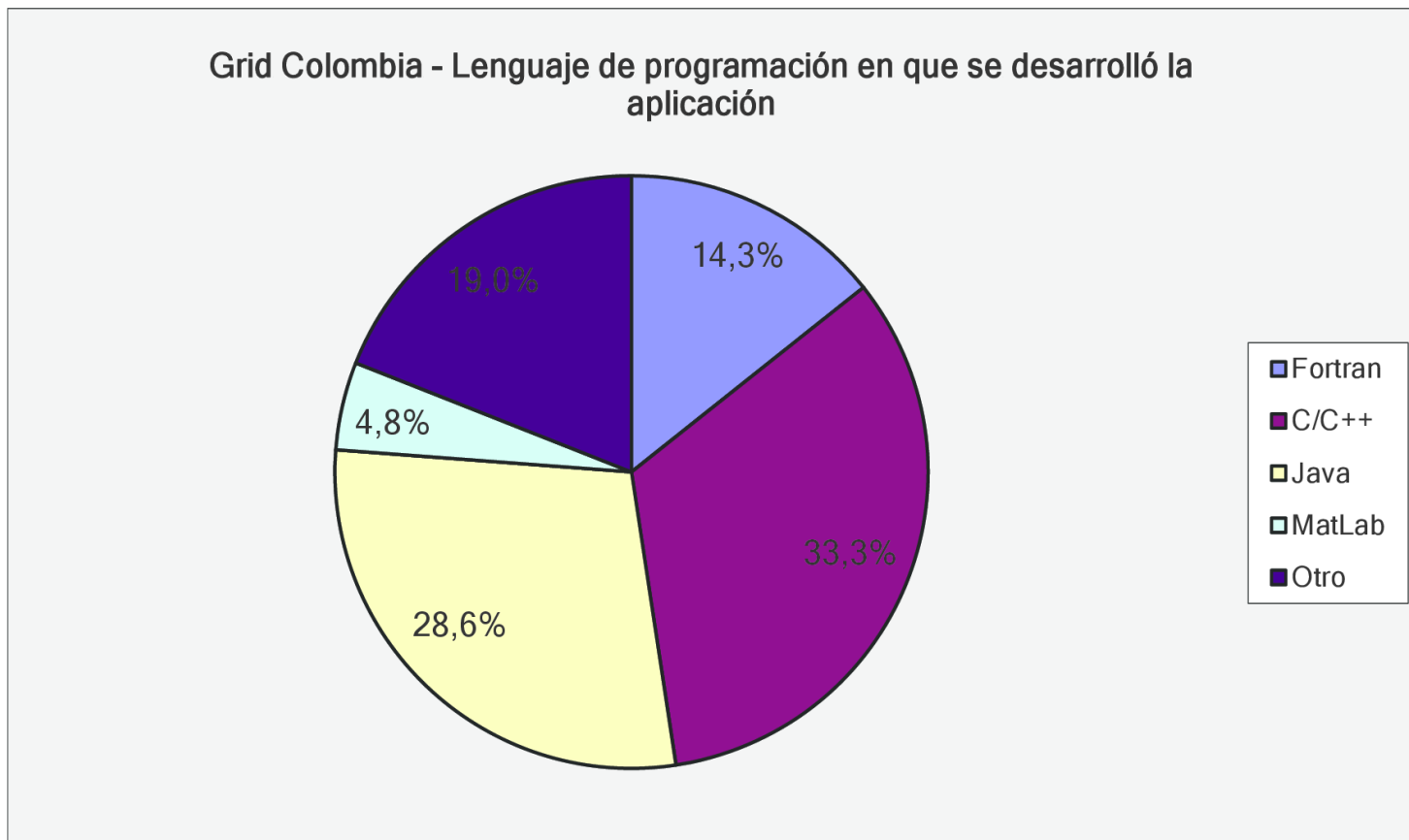
Complex network infrastructures



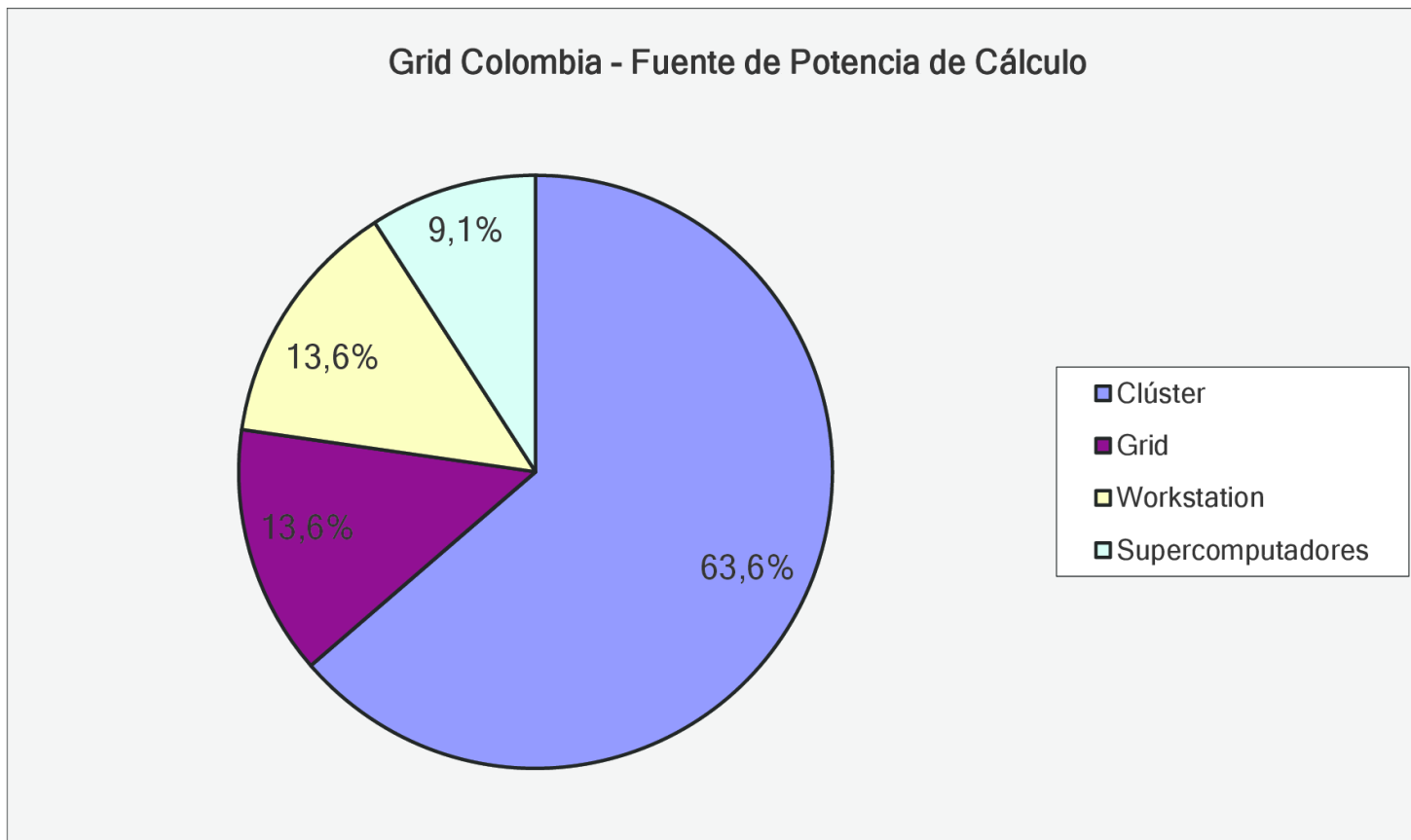
What about the applications?



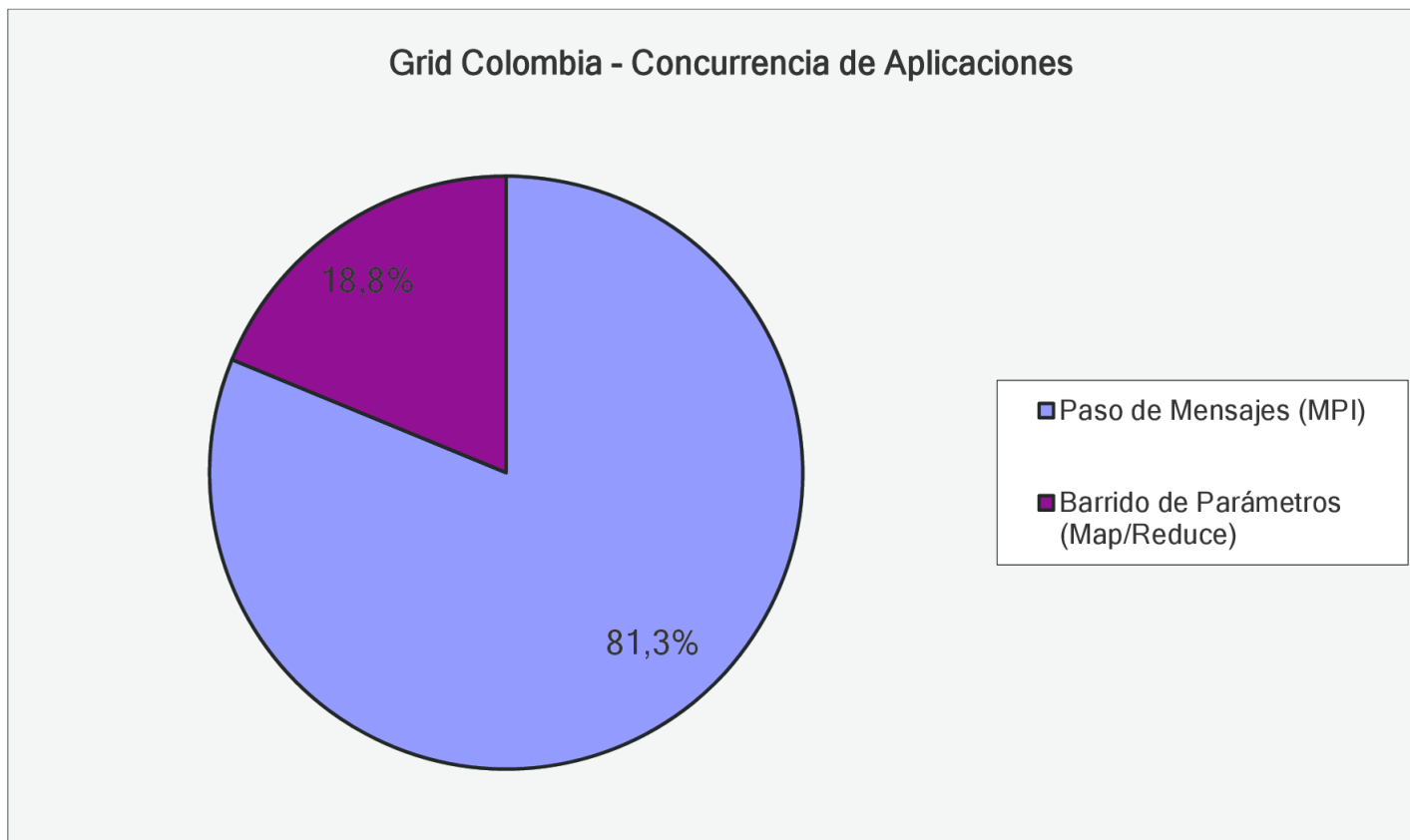
Applications and their programming languages



Applications and their actual infrastructure



Applications MPI or PSA





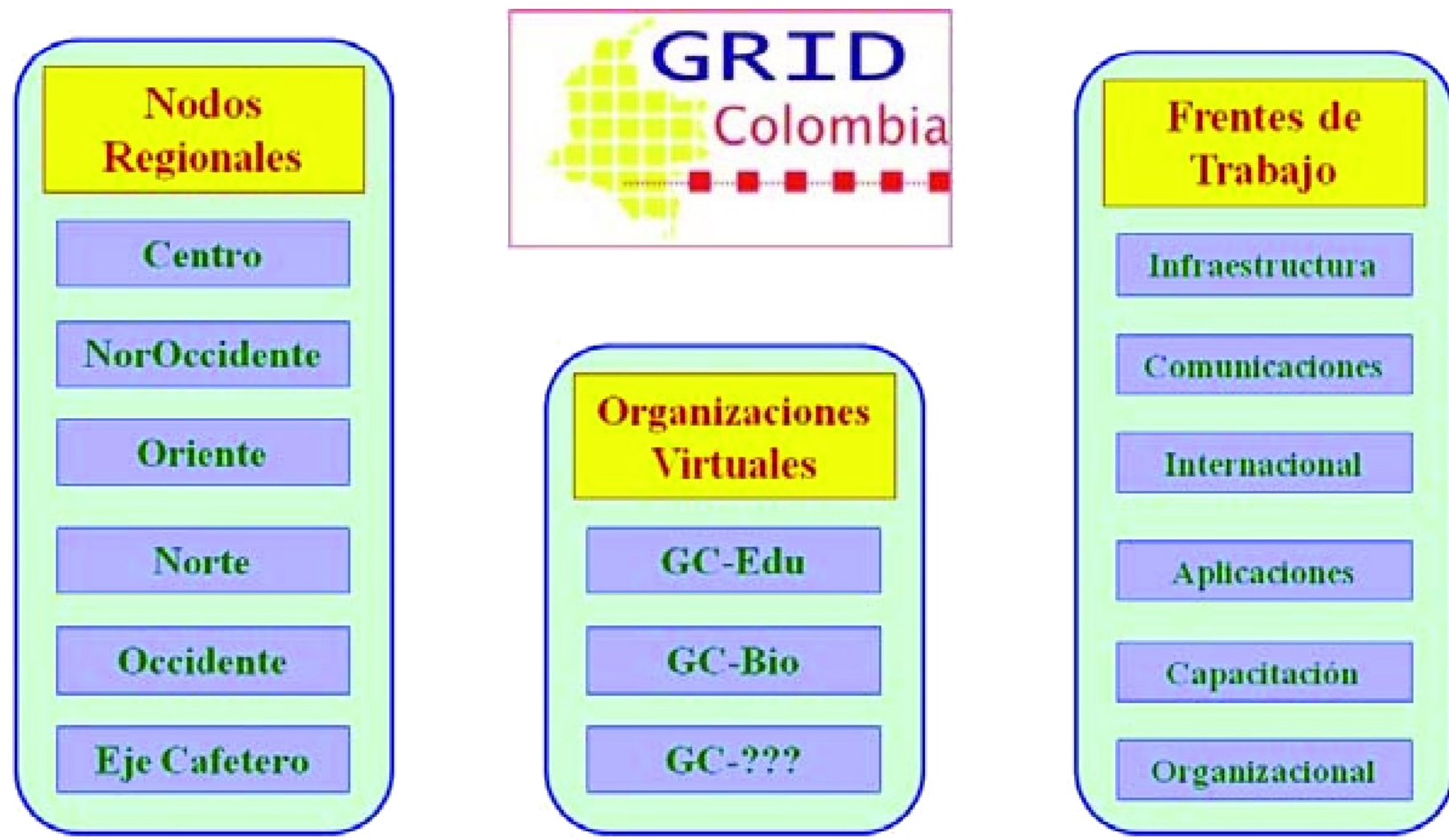
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Workshops

- Two workshops have been taught
 - Sys admin, infrastructure deployment
 - End-users, using tools
- Each workshop has a main event and attendees must replicate the activity in their local nodes

Organizational model





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Regional coordinators

- Monitor local resources
- Get in touch with local academic institutions and research centers
- Give support to new members
 - Local workshops or training sessions
 - On-site support

Virtual organizations

- GC-EDU
 - Where old and new members are part of
 - VO where new features are tested
- BIO
 - Universidad del Valle
 - CENICAFE
- Others
 - mechanics simulation
 - nano-technology



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Work fronts

- Applications
- Communications
- Infrastructure
- Internationalization
- Steering committee

Other outcomes

- Manual for node installation
 - Digital Guide - ISBN 978-958-716-503-6
- Postgraduate thesis

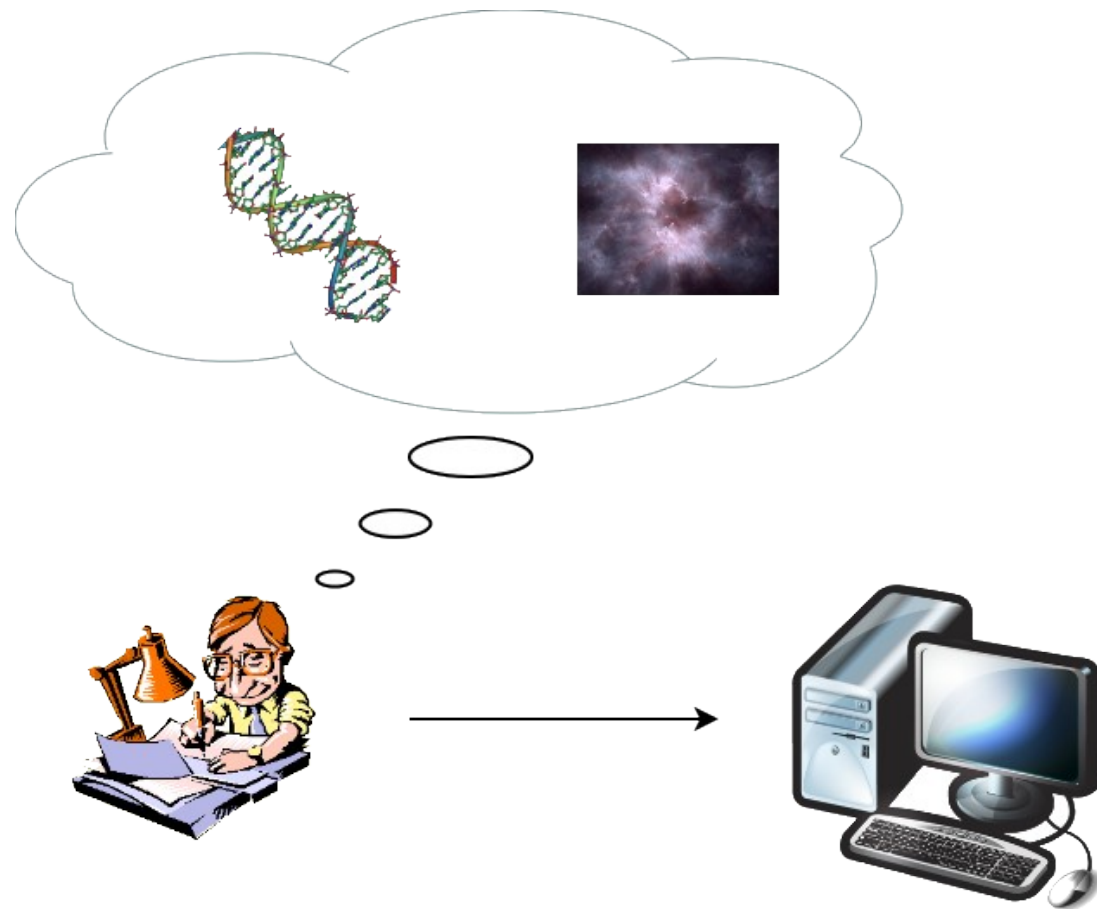
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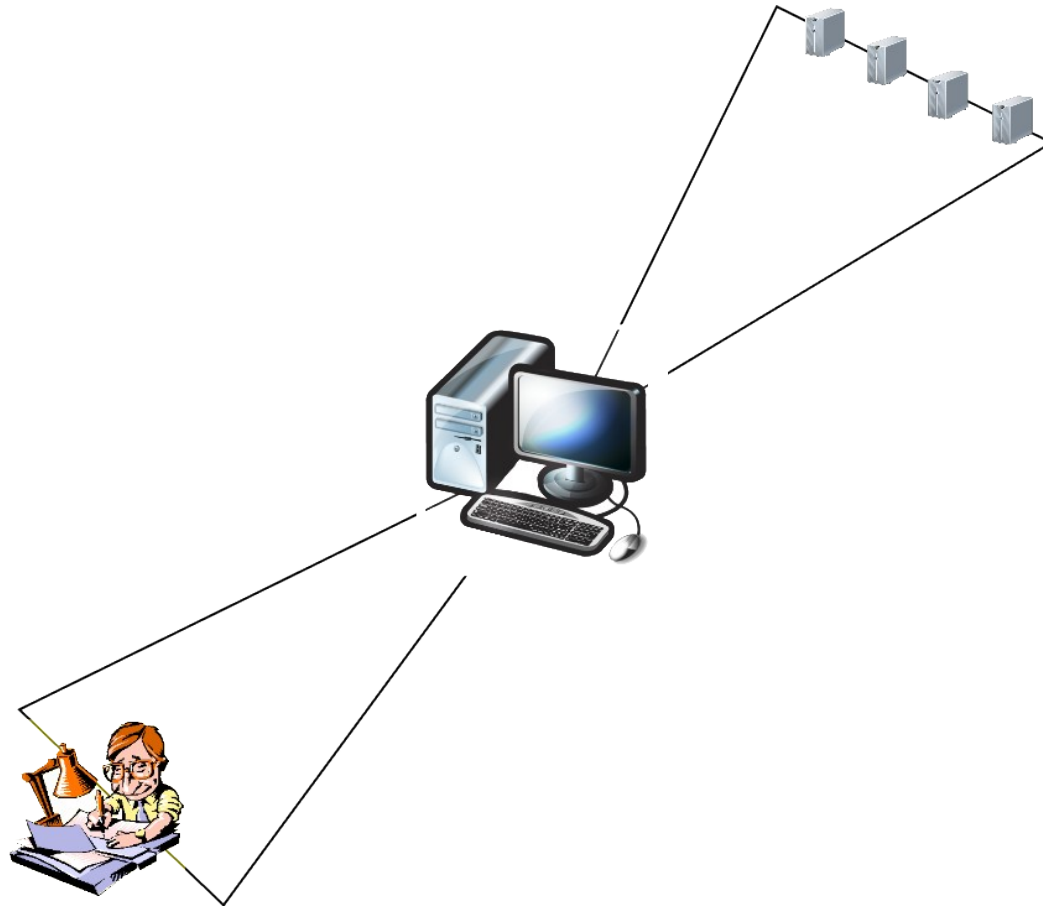
Infrastructure front

- To automate the deployment of infrastructures
- To deploy a load balancer (GlideinWNS)
- To deploy a ticket system
- To deploy monitoring tools

Problems that we are tackling

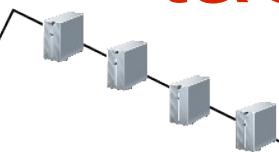
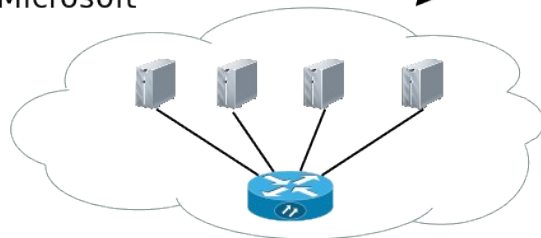


Problems that we are tackling



Problems that we are tackling

Cloud Provider: Amazon, RackSpace, Microsoft



Stack of solutions

DSL, CLI
and
web interface

Lib-middleware
(libcloud, ¿libgrid?)

Services + middlewares

Operating systems



Bare metal

Nimbus

Cloud (IaaS): OpenStack, CloudStack, Eucalyptus

Grid: Globus, gLite, Legion, ARC

Provisioning tools: vagrant, chef, orchestra, juju

Virtualization: VirtualBox, Vmware, KVM, XEN, libvirt

OS: Debian, RedHat



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Why GC can be an important player for OSG



- We have a geographical strategic position
- We know region's issues concerning about technology and culture
- We lived a grid deployment process from scratch

Why GC can be an important player for OSG



- We have developed wealthy documentation and skilled personnel
- We have people working with EELA

Questions

