France-Grilles DIRAC services
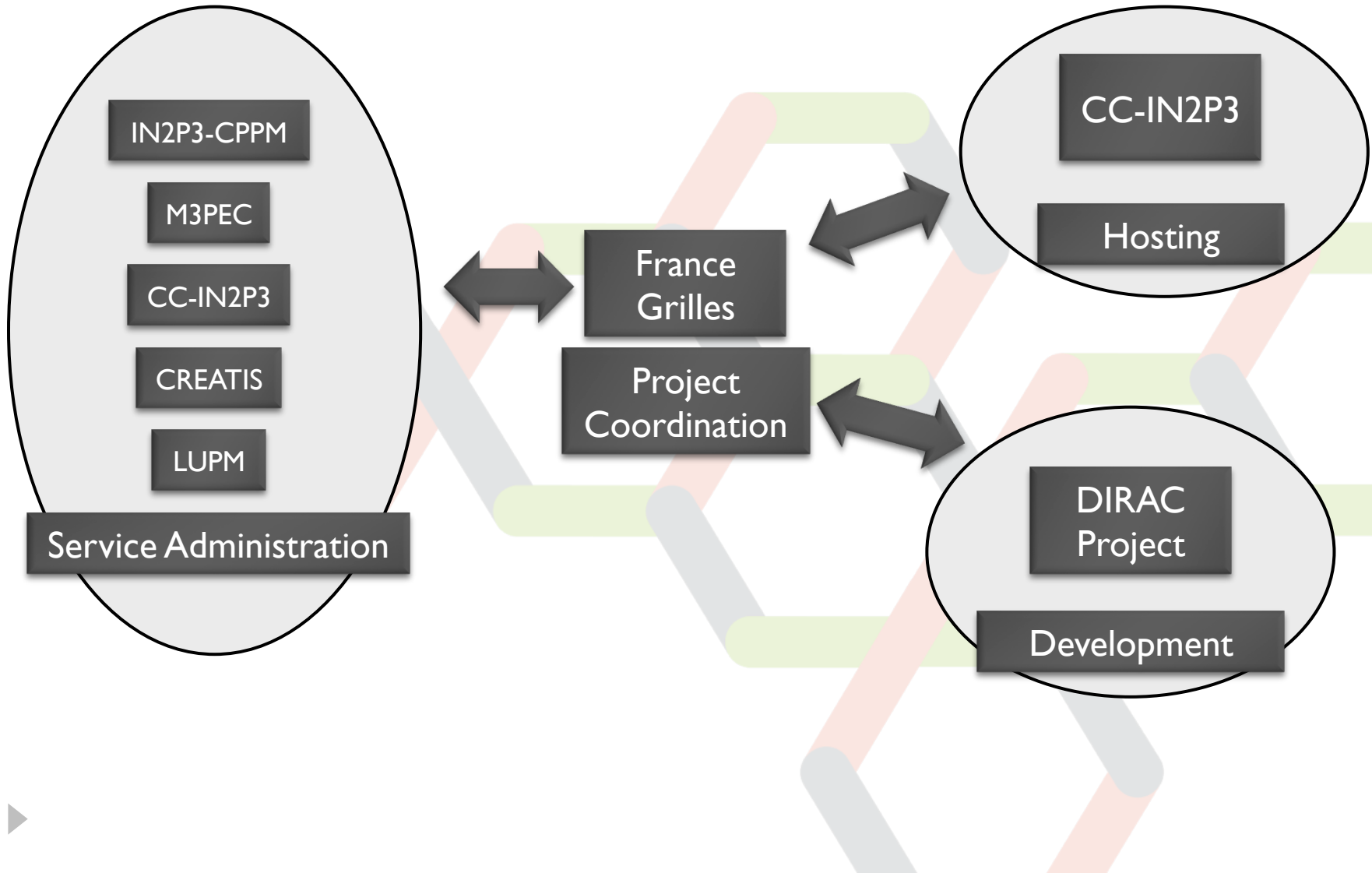
Vanessa Hamar

CC-IN2P3

- ▸ History
  - ▸ Before
  - ▸ Idea
  - ▸ France Grilles – DIRAC Project
- ▸ Perspectives
  - ▸ Advanced services in CC
  - ▸ Support for multiple communities
  - ▸ Support for various computing resources
- ▸ Conclusion

- DIRAC installation existed in the CC for supporting grid tutorials

  - All the services in a virtual machine not suitable for massive usage

  - Only one VO supported formation

  - Active users only during tutorials

DIRAC
THE INTERWARE

IN2P3-CPPM

M3PEC

CC-IN2P3

CREATIS

LUPM

Service Administration

France Grilles

Project Coordination

CC-IN2P3

Hosting

DIRAC Project

Development

France Grilles – DIRAC project

- **Initialization** (September 2011 – January 2012) ✔
  - Initial agreements to start the project
  - Hosting agreement
    - CC and France-Grilles to provide hardware and hosting environment for the DIRAC service adequate to the usage of all the France-Grilles resource in France
  - First platform installation
  - First list of pilot communities
  - Software deployment
  - Definition channel communication

- **Placement** (February – April 2012) ✔
  - Administrators team structuration
    - CPPM, CC-IN2P3/Lyon, CREATIS
    - Universities of Bordeaux, Montpellier, Nice
  - Functional test
  - Hosting agreements

CC DIRAC server configuration

- 5 servers
  - 8 cores, 16 GB RAM, 1TB disk
  - *ccdirac01* – secure services, configuration
  - *ccdirac02* – Workload Management
  - *ccdirac03* – Data Management
  - *ccdirac04* – StorageElement, Accounting, Monitoring
  - *ccdirac05* – Web Portal
    - http://dirac.france-grilles.fr
- MySQL server
  - 30GB, 100 connections
- Redundant supporting services outside the CC in Lyon
  - CPPM, CREATIS, etc

France-Grilles Operations Lille, 10/05/2012

Server installation in CC/Lyon

- Basic DIRAC services
  - WMS – managing users jobs
    - Job submission, monitoring, retrieval
    - Accounting of the resources consumed
  - DMS – managing user data basic tasks
    - Access to standard Grid Storage Elements
      - SRM, DIRAC
    - Replicating data between SEs
    - Providing Simple Storage Element in Lyon
    - DIRAC File Replica Catalog
    - DIRAC File Metadata Catalog
- Web Portal

Formation administrateurs DIRAC   Lyon 18-19/01/2012

France Grilles – DIRAC project

- **Production** (May 2012) ✔
  - The servers are now installed in Lyon and fully functional
  - 15 VOs configured:
    - astro, auger, biomed, esr, euasia, gilda, glast.org, prod.vo.eu-eela.eu, vo.cta.in2p3.fr, vo.formation.idgrilles.fr, vo.france-asia.org, vo.france-grilles.fr, vo.msfg.fr, vo.mcia.org, vo
  - 88 users registered
    - 1 robot user VIP/GateLab Biomed
      - ☐ Creatis jobs are sent to national instance
  - Resources available for registered VOs are configured in the DIRAC service
    - Computing Elements
    - WMS instances
    - Storage Elements

Service maintenance tasks

- Support for DIRAC services
    - Resources description and status monitoring
    - Software updates
    - Services monitoring
- Support of DIRAC users
    - VO administrators
    - User/group registration
    - Policies, quotas management
- Tools to help maintenance tasks are being actively developed now
    - New Web interfaces to come

France-Grilles Operations Lille, 10/05/2012

User support

- VO administrators
  - Handling user registration requests
  - Basic help
  - Checking the description of resources available for the users of the VO
- Forums
  - Exchange of user experience
  - FAQs
  - http://groups.google.com/group/diracgrid-forum
- Tutorials
  - Regular user tutorials
  - Specialized tutorials
  - Administrator tutorials

France-Grilles Operations Lille, 10/05/2012

Support for grid infrastructures

- No technical limits to add more users, VOs, resources
  - Exact policy is to be defined
  - Extra load on administrators
  - More opportunities to involve extra manpower for maintenance tasks
- Support for other Grid projects
  - GISELA
    - Main services are provided by the DIRAC service in Lyon
    - Redundant auxiliary service in Rio, Porto, …
  - Others can join as well
    - Eu-asia

France-Grilles Operations   Lille, 10/05/2012

Application support

- Help in porting applications to the grid
  - Standalone applications to be gridified from scratch
  - Applications with existing portals to run on a larger resources base
    - E.g. collaboration with the Scientific Gateway and other portal infrastructure projects
- RESTFul DIRAC interface
  - To help using DIRAC from application portals
  - Provide language neutral API
  - Can be used as basis for the DIRAC (J)SAGA interface
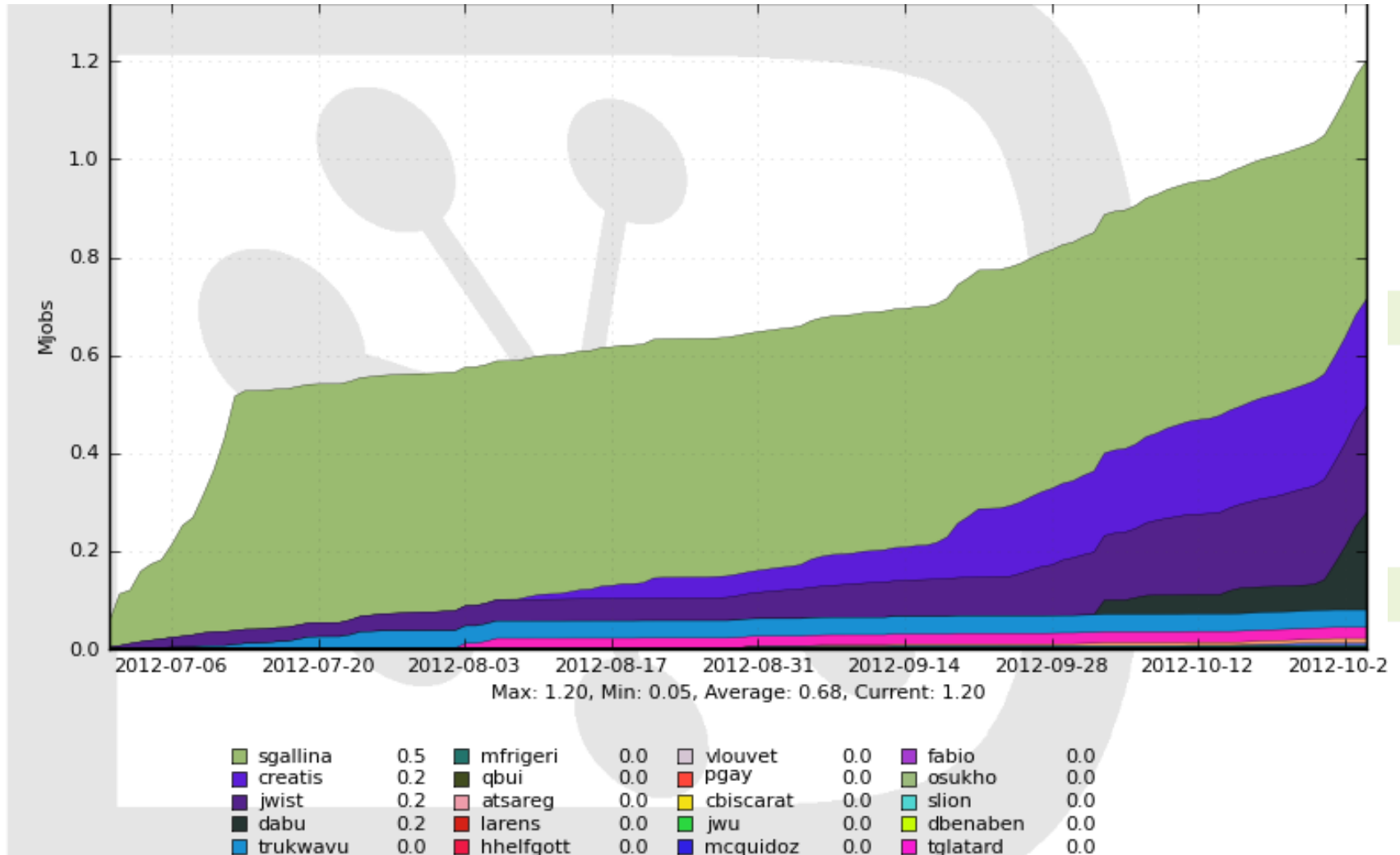   - Multiple portal rely on JSAGA interface

Advanced services

- More advanced services can be made available in CC Lyon
  - Following the user demands
  - Transformation Service (automated job submission)
  - Replication Service (automated data replication)
    - Parallel and/or complementary to iRods
  - Data integrity inspection
  - User storage and CPU consumption Accounting
  - Support for MPI jobs
  - Others ?
- Hosting Community DIRAC services
  - Specific services developed for particular communities can be hosted in the same infrastructure

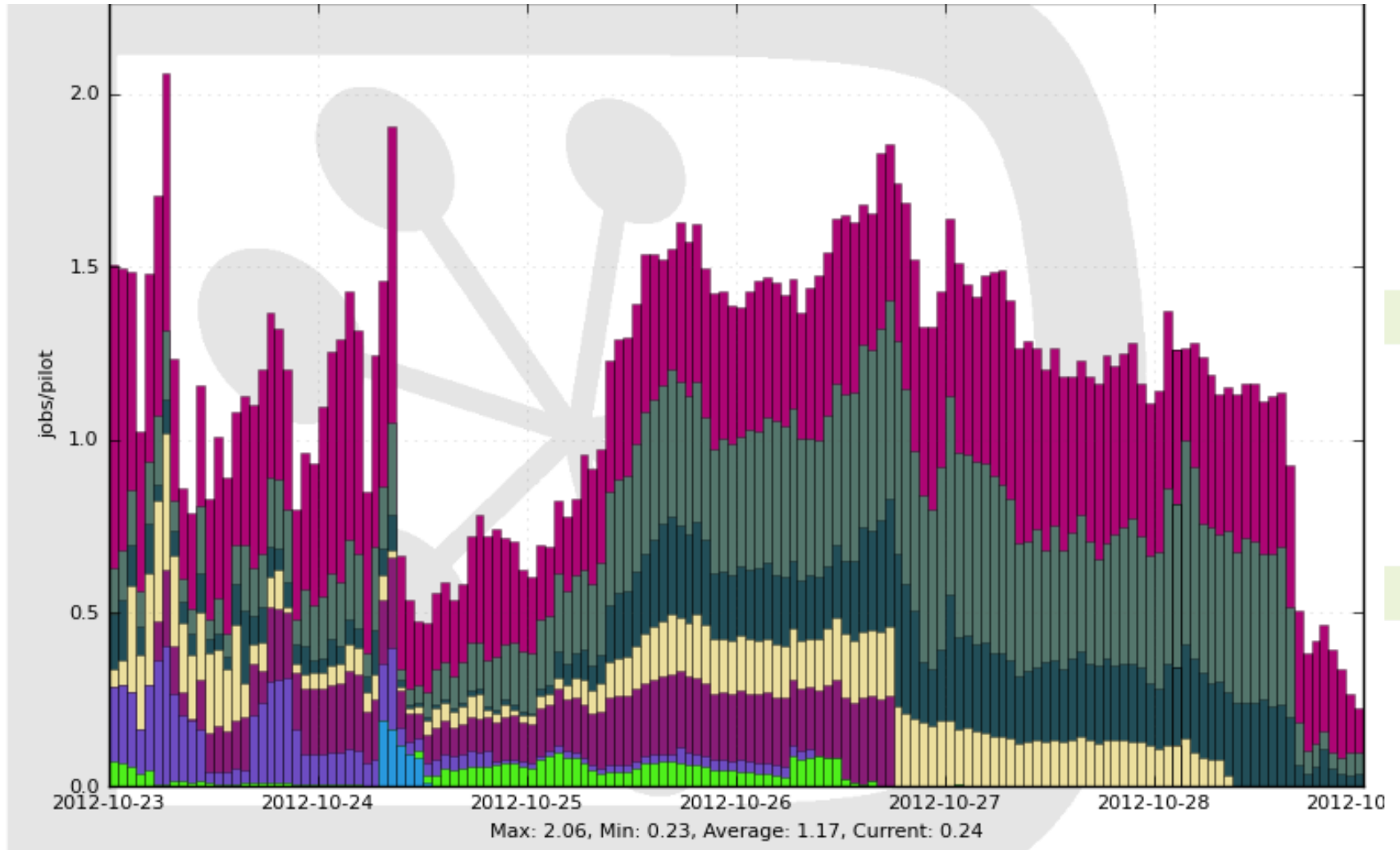# Resources that can be provided via the DIRAC Service

- Grid resources
  - France-Grilles, GISELA, …
- Clusters (Torque/PBS, LSF, SGE, Condor, etc)
  - Can be made available for particular user community and/or for common use
- Clouds (Amazon, OpenNebula, OCCI compliant)
  - Development is in full swing
  - Building DIRAC virtual clusters on the fly
- Desktop grids (BOINC based with support for virtualization)
  - Campus grids

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Support for VO specific resources

▸ Many resources available through the DIRAC service interface are limited to certain communities

  ▸ Computing Elements

  ▸ Storages

▸ The access control to those resources by members of different VOs is subject to precise rules

  ▸ This is different compared to single VO installations, e.g. LHCb

▸ Configuration of Computing Elements with VO access information is available

▸ More work is to be done for description of VO specific Storage Elements and other services, e.g. catalogs.
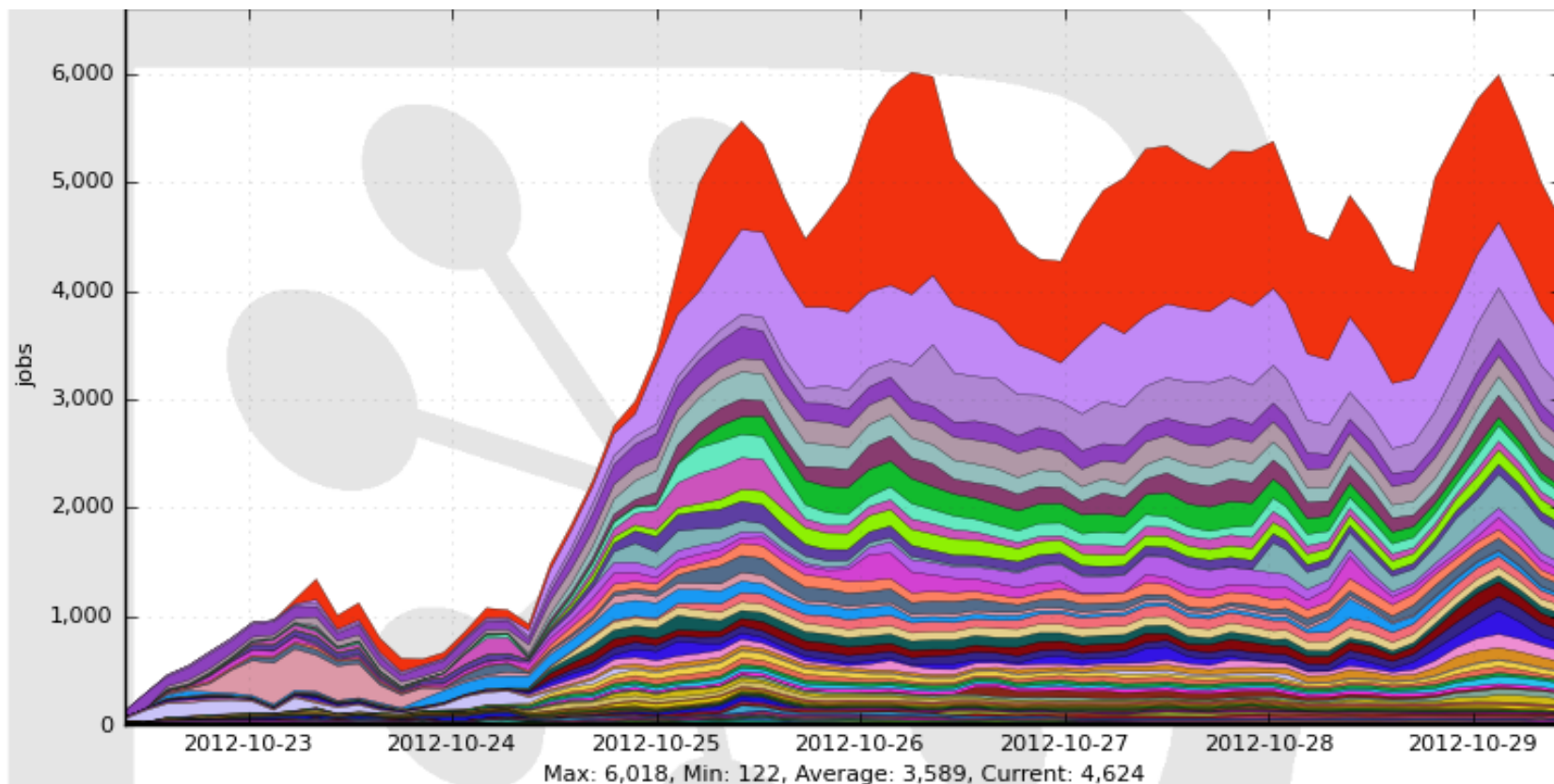
  ▸ This is being actively developed now

France-Grilles Operations

Cumulative number of jobs

Number of jobs by pilot

Max: 2.06, Min: 0.23, Average: 1.17, Current: 0.24

Jobs by site

Max: 6,018, Min: 122, Average: 3,589, Current: 4,624

■ LCG.PISA.it	21.6%	■ LCG.DATAGRID.fr	2.2%	■ LCG.CNAF.it	1.8%
■ LCG.BARI.it	11.8%	■ LCG.EFDA.or	2.1%	■ LCG.CYFKR.pl	1.6%
■ LCG.UNINA.it	5.5%	■ LCG.MSFG.fr	2.1%	■ LCG.JINR.ru	1.6%
■ LCG.IN2P3.fr	4.0%	■ LCG.UKIR.uk	2.0%	■ LCG.UKIAC.uk	1.5%
■ LCG.CLERMONT.fr	3.8%	■ LCG.UKIG.uk	2.0%	■ LCG.ZIH.de	1.5%
■ LCG.RAL.uk	3.3%	■ LCG.NIKHEF.nl	2.0%	■ LCG.ROMA3.it	1.4%

Max: 239,049, Min: 97,049, Average: 192,688, Current: 229,298
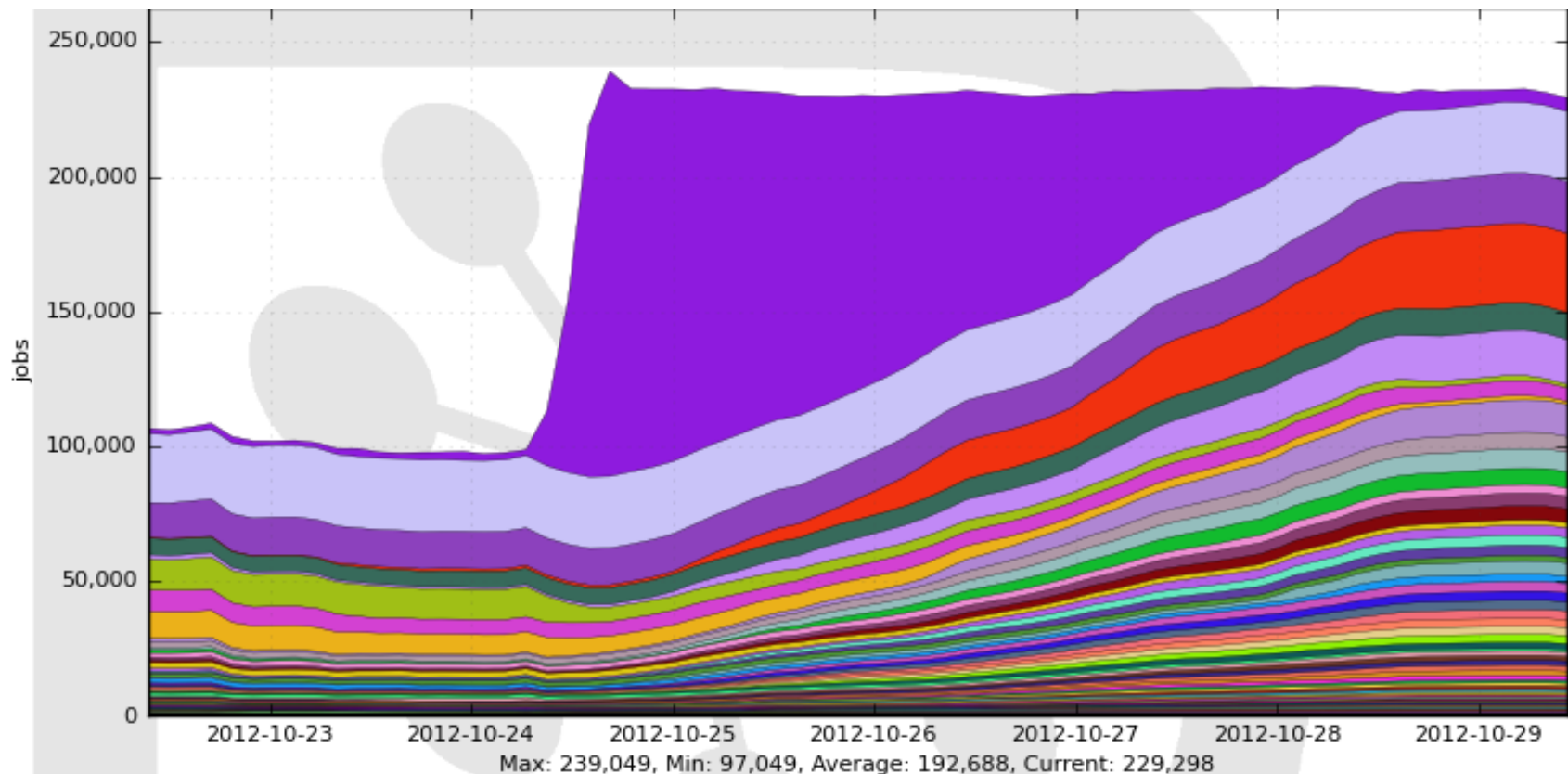
■ ANY	26.0%	■ LCG.UNINA.it	2.4%	■ LCG.SBG.fr	0.9%	■ LCG.DESY.de	0.7%
■ LCG.CERN.ch	13.8%	■ LCG.CLERMONT.fr	1.8%	■ LCG.MSFG.fr	0.9%	■ LCG.JINR.ru	0.7%
■ LCG.IN2P3.fr	7.9%	■ LCG.RAL.uk	1.7%	■ LCG.ULA.ve	0.9%	■ LCG.EFDA.or	0.6%
■ LCG.PISA.it	6.0%	■ LCG.UKID.uk	1.5%	■ LCG.UKIR.uk	0.8%	■ LCG.UKIAC.uk	0.6%
■ LCG.IPGP.fr	3.9%	■ LCG.CIEMAT.es	1.2%	■ LCG.CNAF.it	0.8%	■ LCG.IEETA.pt	0.5%
■ LCG.BARI.it	3.7%	■ LCG.INGRID.pt	1.2%	■ LCG.DATAGRID.fr	0.8%	■ LCG.LPSC.fr	0.5%

Conclusions

▸ The France-Grilles DIRAC service in CC is up and running

▸ A team of administrators is formed

  ▸ Tools to help administration tasks are being developed

▸ Support for multiple VOs is mostly in place

  ▸ More development is needed to properly configure access control to various resources by different VOs

▸ We are devoted to provide user with a friendly grid interface for their practical tasks

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