Life Sciences Use Cases of FG-Cloud, the French Multidisciplinary Federated Cloud

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Objectives & Strategy

Objectives

- Build a federated Cloud in France using Open Standard for the analysis and computation of scientific data
- Open the service to all scientific communities
- Create a Cloud expert community
- Valorize the service by disseminating our work and promote Cloud computing on our infrastructure
- Help sites join the EGI Federated Cloud

Strategy

- Link together independent initiatives (Cloud software or resource provider)
- Be compliant with third-party strategies (sites, partners, ...)
- Cloud middleware is not imposed …
- Ease to add a new partner
- Managed by a coordination team

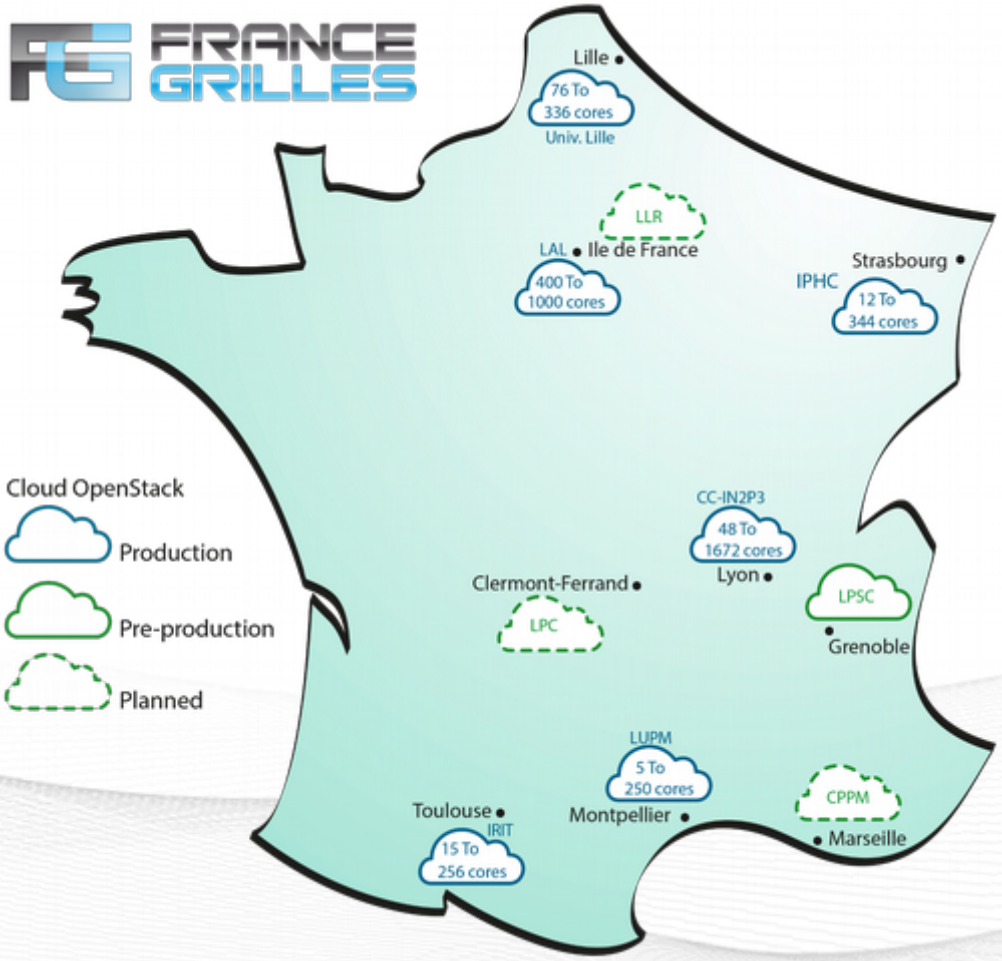
Achievements

A production-level infrastructure

- Service available through France Grilles service portfolio
- Unified authentification system
- Seamless access to the resources is possible with SlipStream and DIRAC
- Single marketplace for distributing VM images
- Centralized monitoring based on Nagios and Tempest
- Growing infrastructure

For scientific computations

- Infrastructure validated through a Cloud Challenge
- More than 20 projects using the service on a daily basis



Service portfolio for users

- Multi-cloud cluster instantiation
- Recipes to interact with other services like FG-iRODS
- Hosting of servers to ensure resource availability
- Short training over videoconference, as well as longer training (3d)
- Documentation
- Multiple frontend to the resources (DIRAC, SlipStream, Horizon, API, ...)
- Help user to access EGI FedCloud
- Training about VM management (include Cloud-Init tutorials)

Bio & Medical Imaging

Virtual Imaging Platform (VIP)

- Web portal for medical simulation and image data analysis
- Using DIRAC and Biomed VO
- Biomed VO use only French Cloud resources
  → http://dx.doi.org/10.1109/TMI.2012.2220154

Creatis

High-throughput phenotyping (Phenome)

- Collecting large amount of phenotypic data
- Storage based on iRODS (~ 1PB)
- Data analysis requires Grid or Cloud Computing
- Cloud computing workflow is validated

Bioinformatics

System biology

- Analysis of social learning
- Network analysis
- Based on R scripts and libraries (*RSiena*)
- Required large VMs (> 200 GB memory)
  → http://dx.doi.org/10.3389/fpsyg.2016.00539

French Institute of Bioinformatics (IFB)

- French node of Elixir
- Operates a community Cloud for Bioinformatics
- IFB-Core, a SaaS Cloud hosted at IDRIS and a set of secondary sites (satellites)
- Two satellites in production also FG-Cloud members (IPHC and University of Lille)

Medical Research

Hackathon
- Hacking Health Camp (Strasbourg, March 2016)
- Needs on-demand resources for a week-end
- Docker as a Service
- Proof of concept

HACKING HEALTH

SME
- An INRIA Startup based in Rennes
- Expertise with Galaxy workflows (genomics)
- Needs several servers for the development of a showcase
- Fund raising

Genomic analysis
- Providing Cloud computing for human genome analysis
- Anonymous data
- Strong focus on security (dedicated tenant, encrypted disks, specific policies, ...)
- Dedicated SLA

More information?

Meet us at the France Grilles booth for coffee at 10.30!