Hemera From Grid'5000's Technical Team Point of View

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Introduction

Grid'5000

- Hemera work pushed the limits of Grid'5000 platform
  - ▶ Large scale experiments have become common
  - ▶ New services have emerged
- → Collaboration with technical team was needed
  - → Benefits for all Grid'5000 users

- Agenda:
  - ▶ Overview of Grid'5000's technical team
 - ▶ Hemera and technical team collaboration
  - ▶ Discussion

Grid'5000's Technical Team

Technical Team

Members:

- David Margery, Technical Director
- Support Staff:
  - → 2 Inria IJD Inria, 0.8 Université de Rennes IE, 0.5 CNRS IR
- Development Staff:
  - → 1 Inria IC, 1 Inria IJD, 1 Intern
- *2 part time apprentices*

Missions

- Operating the platform
  - → System and network administration (maintenance, software upgrade, ...)
- Developing and deploying new tools
  - → According to scientific requirements from Architects and Sites committees
- Support to users
  - → Documentation, mailing list, ...

Infrastructure

Infrastructure
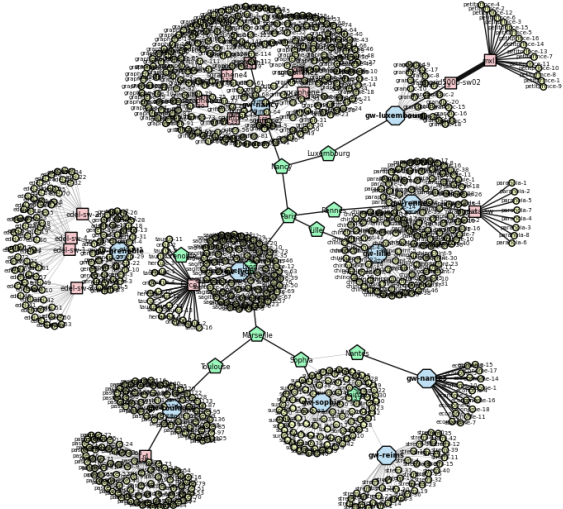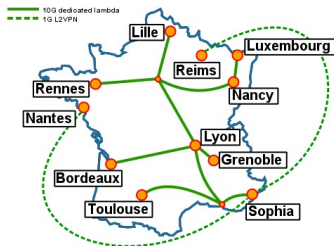
Infrastructure

- Hardware distributed over 10 sites
  - ► 1000 nodes, 7500 cores
  - ► Infrastructure: 381 servers (45 physical)
- Network
  - ► 45 network devices
  - ► 50 IP subnets
  - ► Grid'5000 backbone provided by Renater (dedicated lambda)

Grid'5000 Support to Users

- Wiki Documentation
  - → 12 tutorials supported by technical team
- ≈ 290 mails / year
- ≈ 500 bugs / year, mostly for internal use

Hemera Collaboration with Grid'5000's Technical Team

Advanced Use of Grid'5000 Tools

Grid'5000

- Advanced features made available by technical team, underused so far
- $\rightarrow$ KaVLAN
- $\rightarrow$ Automated discovery and exploitation of resources using the API
- Examples
  - ▶ Grid'5000 school challenges, CCGRID's SCALE challenge...
- $\rightarrow$ Complex tools usage require time and investment

Consolidation

- Undetected problems raised
- Indicator:
    - $\rightarrow$ 91 bugs reported by L. Pouilloux (Hemera Engineer) in 24 months
- Main parts involved:
    - ▶ Reference description of hardware, network topology, energy monitoring devices
    - ▶ Virtualization (hardware and software requisites)
    - ▶ Platform standardization for multi-site experiments
    - ▶ Scaling

Integration of New Tools

- Initially developed inside Hemera
- Transferred to Grid'5000's Technical Team
- Examples:
  - → *funk*: Advanced reservation frontend for OAR
  - → *kwapi*: Fine monitoring of energy consumption, network support added later
  - → *Large storage in Rennes*: Specification from Hemera

Advanced Support for Grid'5000 Users

- Resources dedicated to advanced Grid'5000 usage in Hemera
  - $\rightarrow$ Targeted on support, enabling complex experiments
- No such resources in technical team
- $\rightarrow$ Support staff
  - ▶ "First level" support
  - ▶ Mostly young engineer
- $\rightarrow$ New experienced engineer affected on development tasks

Conclusion

Hemera and Grid'5000's technical team, a successful collaboration:

$\rightarrow$ Advanced usage led to platform improvement

$\rightarrow$ Technological transfer

$\rightarrow$ High level of support for users

Thank you ! Any questions ?