Tutor: Bruno BZEZNIK
Supervisor: Olivier RICHARD

CiGri
Development of computation grid middleware

Killian GRICOURT, Antoine BONFILS, Diego CORREIA DE OLIVEIRA and Tanguy DELAS

CONTEXT

Scientists in the Grenoble area use the **computation clusters** of **Gricad** organization. One of these service interfaces is the CiGri scheduling software, that have been developed by Bruno Bzeznik from 2007 to 2014. Bruno Bzeznik developed the third version of CiGri in **Ruby**. 10 years later, he wants to update CiGri in **Python**. This is a great opportunity to use and test new tools.

DESCRIPTION

The aim of CiGri is to be **able to**, **simplify** the launch of **parametric tasks** called campaigns. Another goal is **to optimise** the use of workstation and processor time. This means, to use the **timeout of CPUs** to execute jobs with a **weak priority**. Finally, CiGri allows to organise the distribution of **normal jobs** and to transmit as much as possible as **best effort** jobs.
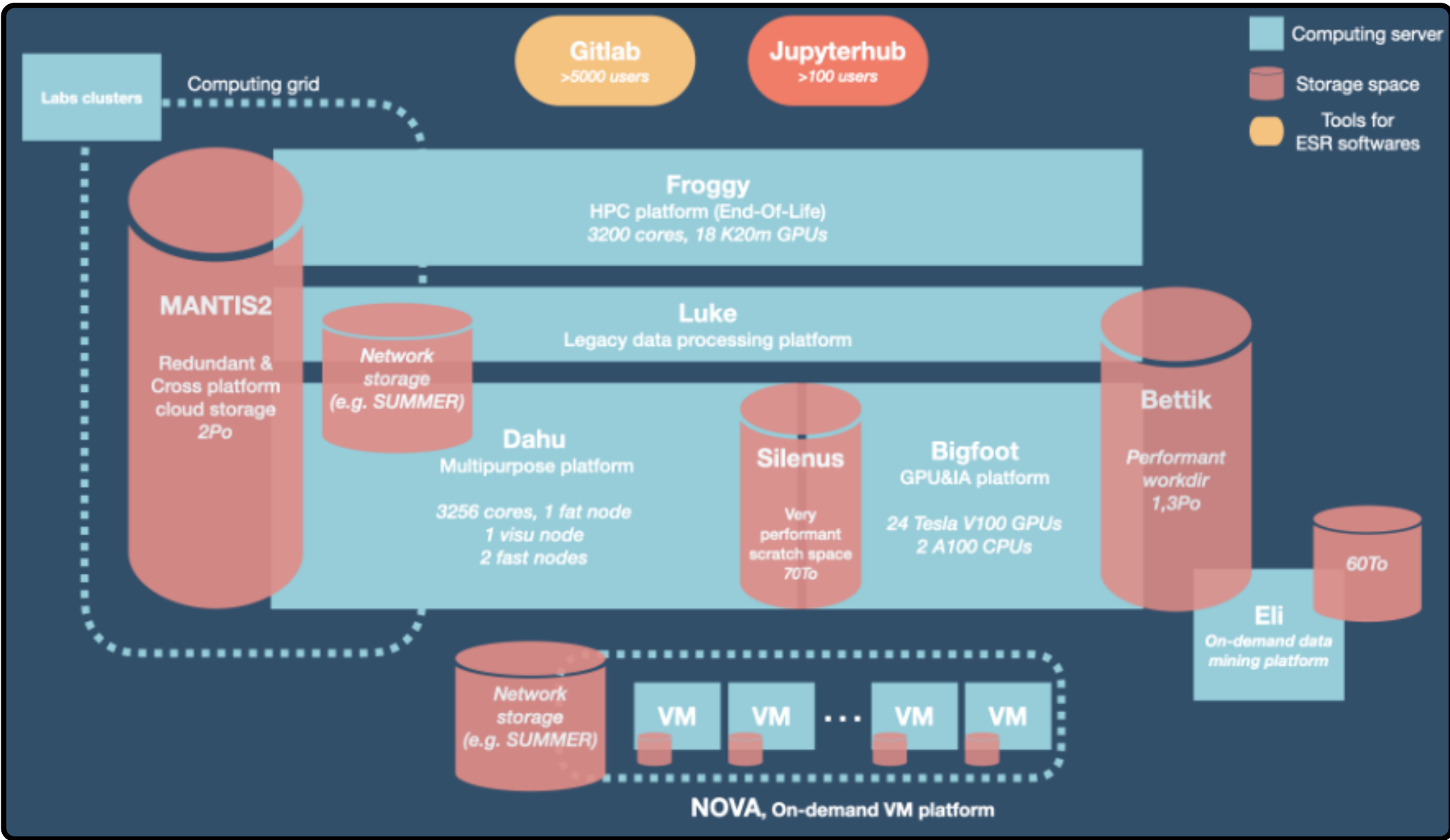

figure: Infrastructure of Gricad 's High Performance Computing Center

TOOLS

- **Prefect**: a workflow orchestrator that allows users to define, schedule, and execute data workflows.
- **Poetry**: a dependency management and packaging tool for Python projects that simplifies dependencies and virtual environment management.
- **FastAPI**: web framework for building APIs with Python 3.8+.
- **SQLAlchemy**: an open-source SQL toolkit and library for Python that provides a powerful and flexible way to work with SQL databases.
- **Rich-Click**: Python library that allows developers to display options commands.

METHODS

- **AGILE method**: an iterative approach to software development that emphasizes collaboration, flexibility, and continuous improvement, typically involving: logbook (journal to document progress), backlog (maintaining a prioritized list of tasks) and daily meetings.
- introducing **Common rules and values**

RESULTS

- Analysis of existing CiGri V3
- Definition of an architecture in partnership with project managers
- Creation of sequence diagrams as specification elements
- Identification and to carry out concepts proofs
- Development of general architecture
- Documentation

REFERENCES

- https://github.com/oar-team/cigri
- https://gricad-doc.univ-grenoble-alpes.fr/hpc/grid/

UNIVERSITÉ Grenoble Alpes

POLYTECH GRENOBLE

LIG LABORATOIRE D'INFORMATIQUE DE GRENOBLE

IMAG

GRICAD