Utilisation du cloud dans Euclid

Rémi Fahed - APC
Cécile Cavet - APC
The Euclid Mission

- ESA medium class astronomy and astrophysics space mission
- Launch planned for 2020
- Understanding why the expansion of the Universe is accelerating and what is the nature of the source responsible for this acceleration which physicists refer to as dark energy
Euclid Science Goals

- Will use two cosmological probes:
  - Weak gravitational Lensing
  - Galaxy Clustering (Baryonic Acoustic Oscillations and Redshift Space Distortion)
Euclid observations

- 15,000 deg$^2$
- IR spectro-imager
- Visible imager
- Ground based observations for photometric redshift measurement
- 10 billion sources
- 1 billion for weak lensing
- $\sim10^7$ photometric redshifts measurements
Simulations
Build framework and utilities: Elements

Constrained environnement:

- CentOS 7
- EDEN: list of available libraries

CI/CD: Continuous test and deployment in SDCs (CODEEN)
LODEEN VM

- Implements the Euclid constrained environment while still giving admin rights to the user
- If the code runs in LODEEN, it will run in production
- Allows the user to progressively adapt its code to the prod environment
- **caveat**: local VM => uses the local machine ressources.

3 GB of RAM
Storage limitation
Run during the working period
Simulations: SimExt@APC

- Need for simulations in a context of low maturity of common tools and infrastructure:
  - Input catalogs size ~400 GB
  - Run time of about 4 days
  - Easy access to a Euclid environment for students

➡ Cloud VM is a good solution for these needs
CLOUDEEN VM

- LODEEN on the cloud: only for APC users (not Euclid consortium)
- Provide the same services as LODEEN but with distant access
- Allows access to more resources
- Allows longer running tasks (scalability tests)

8 GB of RAM
400 GB of storage
FG-cloud

- Federated french academic cloud infrastructures and expertise
- CLOUDEEN on FG-cloud:
  - 1rst: IPHC, group FG-cloud
  - 2nd: CC-IN2P3 (French Euclid’s SDC), group htc-euclid
  - m1.large (4 CPU, 8 GB RAM, 10 GB disk) + persistent storage of 400 GB
Conclusion

- LODEEN user environment is constraining local machine
- CLOUDEEN gives the access to scalable resources and the ability to share environment and data with students
- In the future, DOCKEEN (LODEEN with Docker) will provide multi-infrastructure access