



# PAROMA-MED

Privacy Aware and Privacy Preserving  
Distributed and Robust Machine Learning

## PROJECT SUMMARY

PAROMA-MED will develop, validate and evaluate a platform - based hybrid-cloud delivery framework for privacy- and security-assured services and applications in federative cross-border environments.

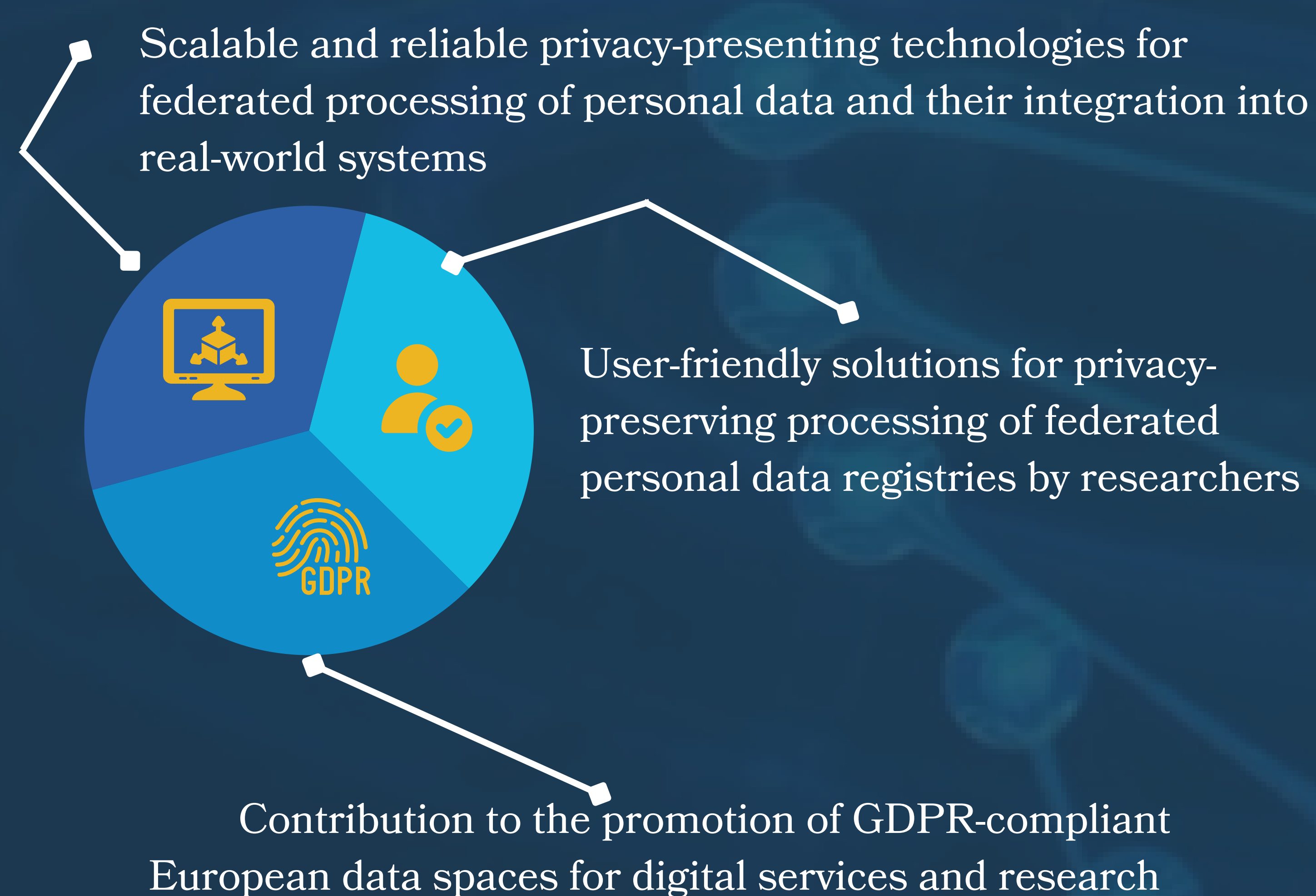
## PROJECT AIMS

- Develop a federation marketplace supported by a platform service for the automatic attestation of federation partners and for their inclusion in the service and data provider catalogue.
- Develop a user-friendly platform service and policy framework to support the developers in defining high-level applications and privacy & security requirements, including the right to be forgotten.
- Develop federative identity management solution and an access management solution based on zero trust principles.
- Develop a secure and privacy-preserving networking solution for flexible access over the internet.
- Develop software defined trusted execution environments that exploit hardware isolation and security capabilities.
- Implement open-source cloud-native solutions, to support efficiency and scalability
- Validate and evaluate the framework by the development of a comprehensive use case with real users in the healthcare sector.

## PROJECT GOALS

- Efficiency and scalability will be insured by the implementation of cloud-native solutions, while future adoption and further development is insured by open-source implementations.
- The project will validate and evaluate the PAROMA-MED framework by developing of a comprehensive Use Case with real users in the Healthcare sector.
- The project will create impact on the application-creation and delivery ecosystem (including standardization and legal stakeholders), on society and environment and manage the impact via dedicated activities and communication channels

## PROJECT OUTCOMES



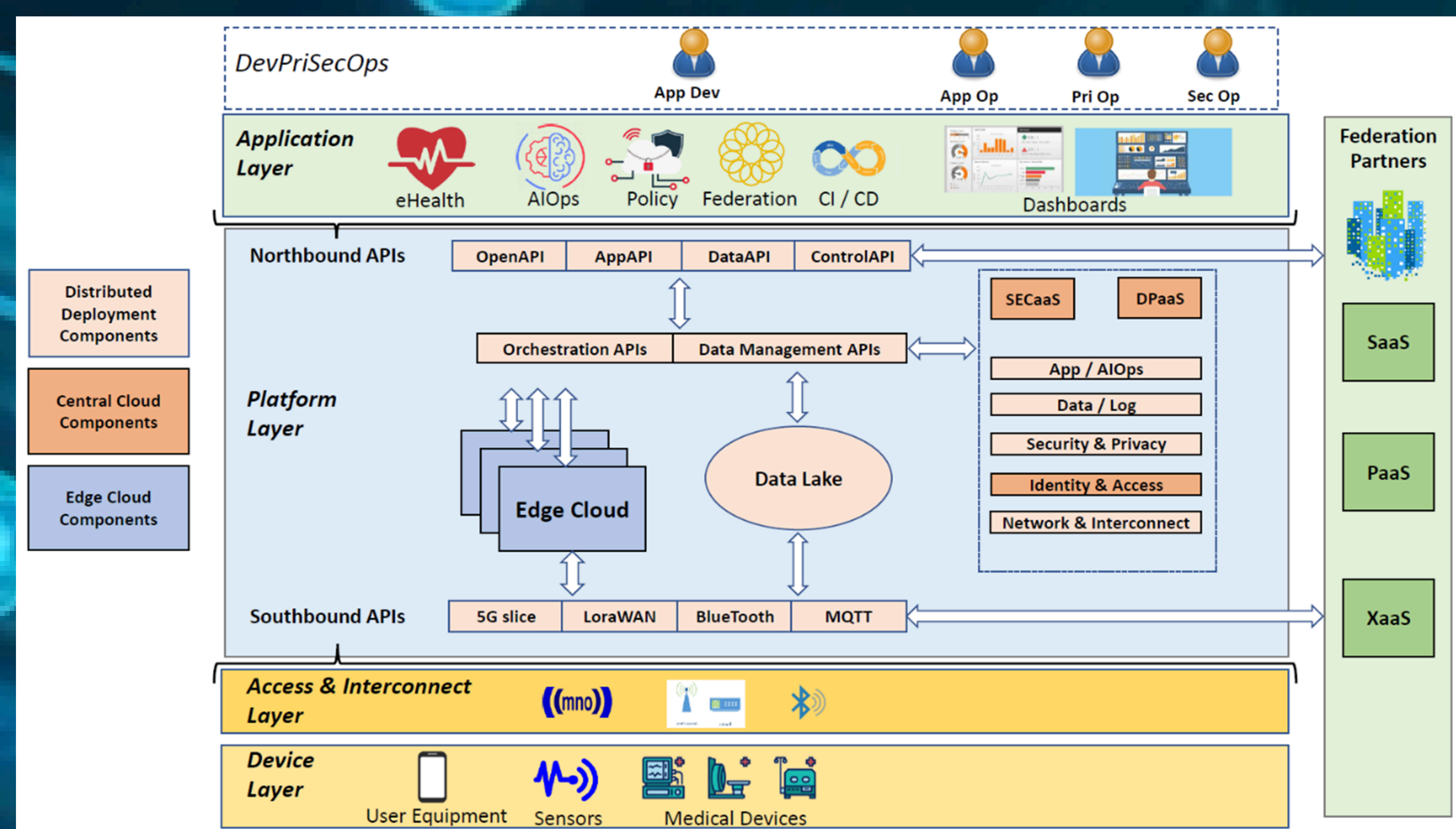
**TIMELINE**

- Duration: July 2022 to June 2025 (36 months)
- Horizon 2020 Research and Innovation Action (RIA)
- Estimated Project Cost and EU Contribution: € 4.3 millions

## METHODOLOGY

The PAROMA architecture is composed of Local Processing Nodes at the edges of the hybrid cloud interconnecting environments with sensitive health data. These local nodes provide the necessary computational and storage resources (Data Center) for processing locally the acquired bio-information (in this use-case, it will be patient images) and generating online results. Data validation may happen with in collaboration with the remote nodes, by exchanging the locally produced bio-information and/or intermediate AI results (e.g. models, data sets, etc). In this way, local nodes generate locally AI-based assessment results but also can get fine-tuned with respect to the underlying data models being exploited by the AI/ML logic, by comparing and using other training data sets residing in the cloud (data lake).

Figure 1: PAROMA-MED High-Level Architecture



## USE-CASE DESCRIPTION OF THE PLATFORM

The developed use-case will be dedicated to the qualitative assessment of cardiac anatomy, based on cardiac imaging, namely the characterization of myocardial wall thinning from cardiac Computed Tomography (CT) images. ML methods that will be used to automatically extract myocardium wall boundaries, and thus to compute its thickness, will be based on Deep learning (DL) techniques, which have demonstrated their ability to segment cardiac images.

Figure 2: Use-case deployment overview (medical applications)

