GLACIATION

Green responsibLe privACy preservIng dAta operaTIONs

THE PROJECT

3 Years

14 Organizations

★ Horizon EU funded project

VALUE PROPOSITION

GLACIATION will enable interoperability across the edge- core-cloud architecture, and improve the enviornmental sustainability of data processing through AI enforced minimal data operations. The data operation service mesh platform performs analytics and applies control at any tier to latency, and to minimize energy and network bandwidth consumption.

GLACIATION'S objectives

Creation of a sustainable and scalable metadata fabric that binds datasets with energy and compute capacity to best serve analytics needs.

Introduction of novel algorithmic mechanisms for AI enhanced service placement that supports, and coordinates Centralized, Distributed and Federated computations.

Development of a flexible, open, vendor-neutral architecture that can support distribution of knowledge graphs with energy-aware edge-core- cloud components.

Creation of mobile portable microservices for the energy-efficient distribution of services and trustworthiness of digital services in support of the privacy of citizens.

Development of privacy preservation models and technologies for supporting the distributed processing of data while also protecting personal data.

Improvement of the state of the art in distributed knowledge graph technology towards energy-efficiency.

Development of a data centric power consumption measurement framework and protocols.

Creation of an AI-enabled data movement engine capable of real-time proactive distributed optimization of data based on predicted energy availability and requirements.

Context

Today's technological landscape consists of a deeply interconnected infrastructure made of devices (mobile phones, sensors, etc.) that upstream data towards the cloud. People and businesse produce and collect data at the edge and share them across the network.

Problem

Despite the edge is scaling up the infrastructure architecture still follows a cloud- based logic. Energy efficiency, privacy, and performance requirements collide in this moment of transition. Whereas energy consumption and privacy needs will push towards the edge, performance (analytics and storage) will pull towards the core.

Solution

Providing stakeholders with a platform that optimises between these trade-offs. GLACIATION provides people, businesses and governments around Europe with cutting edge technological developments on interoperability and data operations. GLACIATION's Distributed Knowledge Graph will be the building block for a data operations platform that implements control at every layer and enables organisations to optimise energy consumption and performance while ensuring privacy preservation.

IMPACT

Meet the growing demand for energy efficient datacentres by providing blueprints on how to meet both high-performance requirements and energy consumption reduction goals.

Facilitates the sharing and manipulation of data in compliance with prevailing and emerging legislation (e.g., GDPR) and needs of data processors and data subjects/ rightsholders and other stakeholders.

Improve the efficiency of data operations in terms of energy footprint and contribute to the visibility and usage of renewable energies for fuelling the storage of data.

Enable safe and secure data handling thereby contributing to the European cybersecurity and privacy preserving efforts.

Prioritize humane, fair, and ethically sound collection, processing, and manipulation of data, in line with the principles of responsible/trustworthy AI.

Boost the creation of a pan-European data infrastructure, particularly in sharing and re-use of data in the context of common European data spaces, GAIA-X, EOSC in various application areas.

DATA-STORAGE PLANNING TOOLS — DISTRIBUTED KNOWLEDGE GRAPH INPUT COLLECTION

GLACIATION SERVICES
1. Metada services
2. Data storage service
3. Data processing monitoring service
4. Trade-off services
5. Prediction services
6. ...Other and Future services

Distributed Knowledge Graph

across Edge to Cloud Continuum

SCOPE

GLACIATION will improve the efficiency and the use of trustworthy digital technologies to address the requirements of citizens, companies and administrations/public organizations on privacy and commercial and administrative confidentiality as well as responsible, fair and environmentally friendly (e.g. in terms of energy/carbon/material footprint) data operations in data spaces, across the data life cycle.
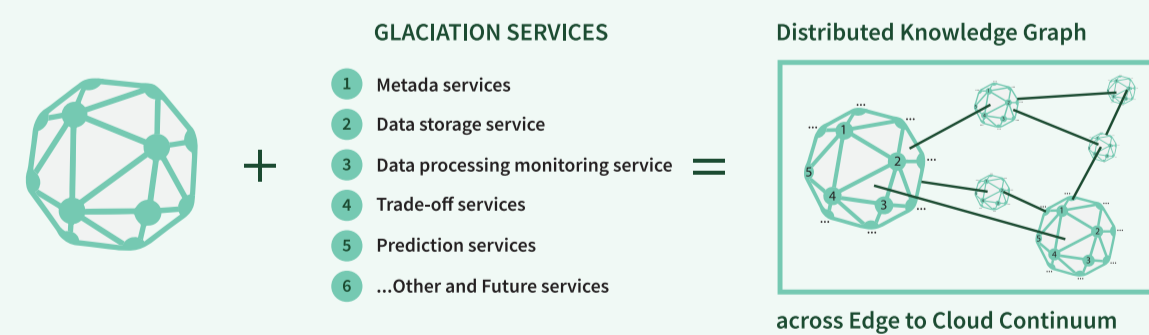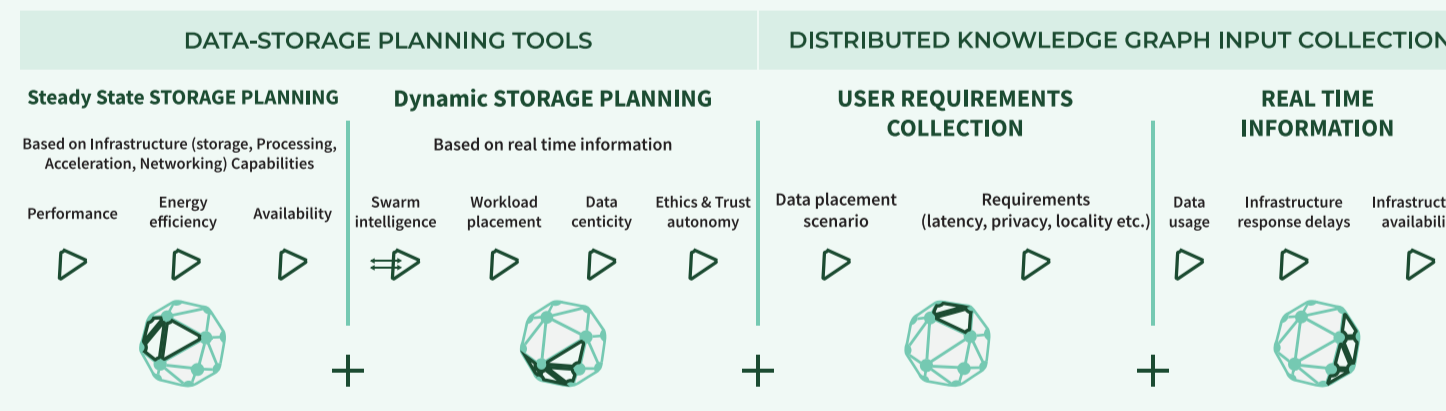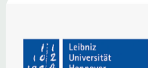
USE CASES

1 Decentralised data management: MEF provides IT services and data management services to over 80 Italian Public Administrations through the "NoiPA" digital platform. NoiPA manages the Italian Public Administration(s) personnel and its staff as well as the COVID-19 Digital Green Certificate (DGC). This use case will introduce edge computing to delegate control directly to the attendance verification system and peripheral offices, reducing data movement and central computational effort, laying the foundation for other applications that can delegate data management and control to solutions near users.

2 Energy-efficient manufacturing: the Dell Technologies Cork Campus runs cobots (collaborative robots) and Tugbots (Autonomous Mobile Robots) generating both data relating to the tasks carried and also about the robots themselves. The latter is not analysed hampering the diagnosis of faults. The GLACIATION platform will include diagnostic data of the robots themselves alongside the functional data to reduce energy consumption of manufacturing.

3 Cross-company analytics: there is an untapped source of siloed, sensitive enterprise data that cannot be easily shared in the clear as it contains personal or business confidential information. To foster further business collaboration and enterprise data sharing in, e.g., the automotive sector, GLACIATION will investigate and improve privacy-enhancing technologies (secure computation, differential privacy) for cross- company business processes and collaborative analytics.

www.glaciation-project.eu