GLACIATION

Green responsibLe privACy preservIng dAta operaTIONs

GLACIATION PROJECT

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the Lisbon council
think tank for the 21st century

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GLACIATION project info

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THE PROJECT

3 Years

16 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.

Ministero dell'Economia e delle Finanze

DELL Technologies

hiro MICRODATACENTERS

Leibniz Universität Hannover

the Lisbon council think tank for the 21st century

UNIVERSITÀ DEGLI STUDI DI MILANO

UNIVERSITÀ DEGLI STUDI DI BERGAMO

ERCIM European Research Consortium for Informatics and Mathematics

EURECOM Sophia Antipolis

SAP

UCC University College Cork, Ireland Coláiste na hOllscoile Corcaigh

sogei

Lakeside Labs

ENGINEERING THE DIGITAL TRANSFORMATION COMPANY

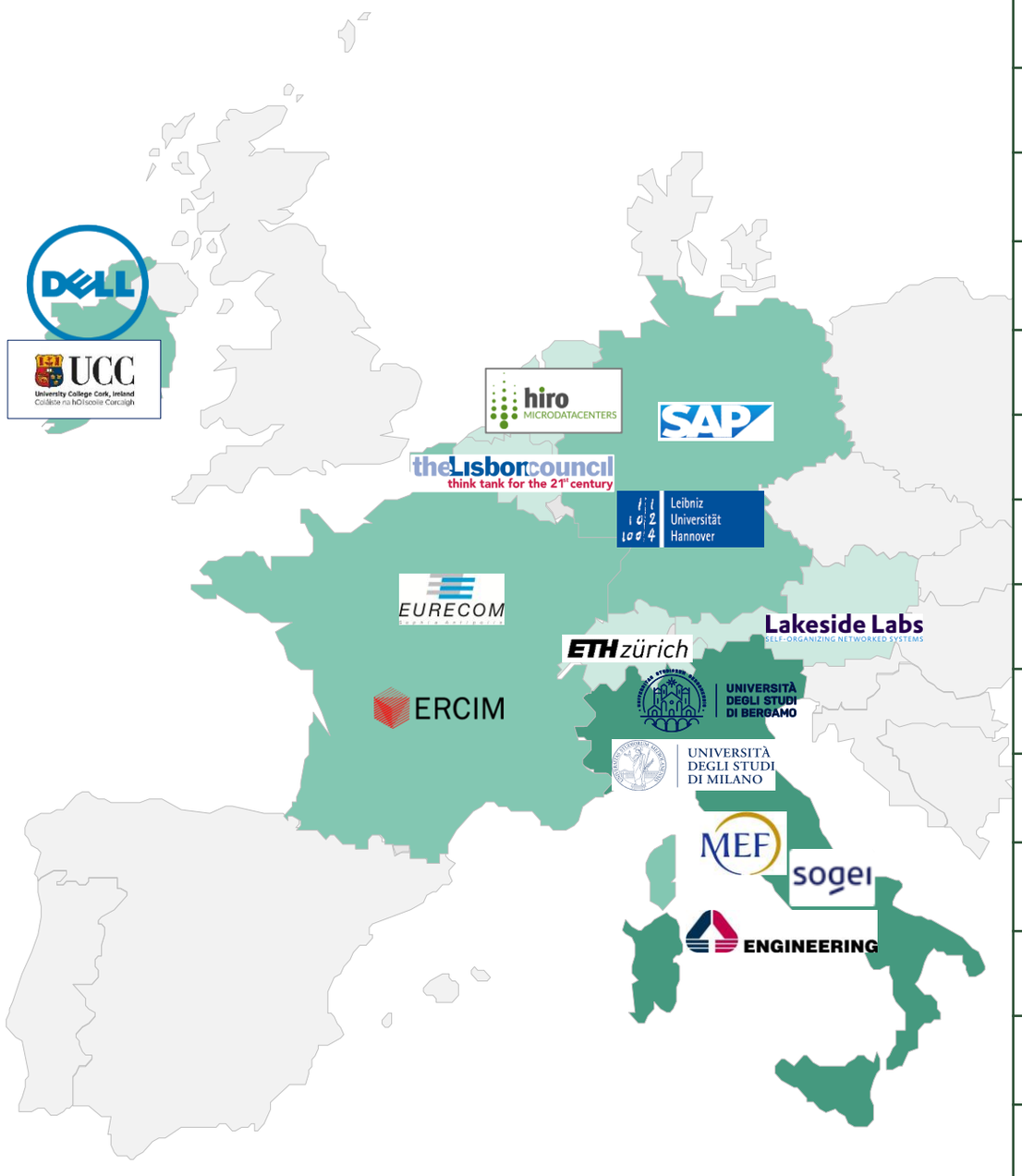
ETH zürich

ipto INDEPENDENT POWER TRANSMISSION OPERATOR

GLACIATION at a glance

Project name:	• Green responsibLe privACy preservIng dAta operaTIONs
Call and topic:	• HORIZON-CL4-2021-DATA-01-01 - Technologies and solutions for compliance, privacy preservation, green and responsible data operations (AI, Data and Robotics Partnership) (RIA)
Duration:	• 36 months
Start date:	• 1st October 2022
TRL:	• Activities are expected to start at TRL 2-3 and achieve TRL 4-5 by the end of the project
Outcome:	• GLACIATION is expected to contribute to the improvement of the efficiency and the use of trustworthy digital technologies to address the requirements of citizens, companies and administrations/public organisations 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.

Our consortium



PARTNER	ROLE
MINISTERO DELL'ECONOMIA E DELLE FINANZE (MEF)	Project's coordinator WP1 Leader; Use Case 1 Lead
EMC INFORMATION SYSTEMS INTERNATIONAL UNLIMITED COMPANY (DELL)	WP7 Leader; Use Case 2 Lead
HIRO MICRODATACENTERS B.V. (HIRO)	WP6 Leader
GOTTFRIED WILHELM LEIBNIZ UNIVERSITAET HANNOVER (LUH)	WP3 Leader
THE LISBON COUNCIL FOR ECONOMIC COMPETITIVENESS ASBL (LC)	WP8 Leader
UNIVERSITA DEGLI STUDI DI MILANO (UNIMI)	Partner
UNIVERSITA' DEGLI STUDI DI BERGAMO (UNIBG)	WP4 Leader
GEIE ERCIM (ERCIM)	Partner
EURECOM GIE (EURECOM)	WP5 Leader
SAP SE (SAP)	Partner; Use Case 3 Lead
UNIVERSITY COLLEGE CORK – NATIONAL UNIVERSITY OF IRELAND, CORK (UCC)	Partner
SOGEI-SOCIETA GENERALE D'INFORMATICA SPA (SOGEI)	Partner; Use Case 1 Lead
LAKESIDE LABS GMBH (LAKE)	Partner
ENGINEERING - INGEGNERIA INFORMATICA SPA (ENG)	WP2 Leader
EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH (ETH)	Associated Partner

What brought us to GLACIATION

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 business 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.

What brought us to GLACIATION

Citizens

- Produce massive amount of **data at the edge**
- Must ensure **privacy** and **data ownership**

Businesses

- Gather and **produce data** at the edge, **store**, **transfer**, and **analyse** data across the network
- Must **ensure privacy**, must stay abreast of competition

Public Administrations

- **Gather**, **store**, **transfer**, and **analyse** data akin businesses
- Must consider **environmental impact** of storing, analysing, and sharing data

GLACIATION
Main objectives

- ✓ Develop a **cutting-edge digital platform** designed to enhance **operational performance** and **energy efficiency** across the **cloud-edge**.
- ✓ Leverage a **novel metadata fabric** and an **AI-powered optimization engine** to drive smarter, more efficient operations.
- ✓ Improve **privacy awareness** while **reducing the environmental impact** of data movement and processing.

Use Cases

UC1: Edge-decentralized data management

DSII at MEF: Manages IT and data services for Italian public administrations using the NoiPA platform, supporting functions like payroll and performance management.

NoiPA Usage: Serves about 2 million civil servants across over 80 public entities, with plans for expansion.

Data Processing Goals: Aims to increase user-centric services while centralizing essential data processing.

Pilot Project: Tests the GLACIATION solution to improve local data handling and efficiency using edge computing and AI/ML technologies on NoiPA.

Challenges and Innovations: Focuses on decentralizing data processing to enhance performance and security in sensitive areas like access management.

Expected Outcomes: Seeks to optimize data flow, reduce energy consumption, and ensure privacy, using NoiPA's existing secure data management infrastructure.

UC2: Data-driven energy-efficient manufacturing

Campus Overview: Dell's Cork Campus is a global hub for various operations like manufacturing, R&D, and IT, powered entirely by renewable energy.

Facilities: Includes a large manufacturing floor and labs, with a focus on energy-efficient technologies.

Robotics Use: Cobots and Tugbots at the site generate task-related and diagnostic data, currently underutilized for fault diagnosis.

Pilot Project: Intends to integrate cobot data analysis into the GLACIATION platform to improve efficiency and data utilization.

Expected Outcomes: Aims to reduce energy consumption, enhance predictive analytics, and optimize data processing.

Assets for Development: Equipped with advanced robotics, computing infrastructure, and proprietary technologies from prior projects.

Use Cases

UC3: Privacy-preserving cross-company analytics

SAP's Current Tech Framework: Employs its Business Technology Platform to integrate systems across businesses for analytics and AI-driven data management.

Data Sharing Challenges: Regulatory and privacy concerns limit the use of sensitive, siloed data, highlighting the need for privacy-preserving technologies.

Pilot Project: Focuses on developing secure computation and differential privacy methods to facilitate cross-company data sharing.

Goals: To enhance demand forecasting and resource planning by introducing privacy-preserving analytics into SAP's platform.

Expected Outcomes: Aims to improve analytics accuracy and reduce production inefficiencies through collaborative data-driven strategies.

Collaborations and Assets: Utilizes SAP's platform and collaborates with automotive alliances like Catena-X to advance privacy-enhancing technologies for supply chain optimization.

UC4: Smart IoT for Enhanced Grid Efficiency and Resilience

Current Status and Challenges: The integration of smart IoT devices into the energy grid is enhancing efficiency and resilience, highlighting the need for a sustainable OT/IT ecosystem. Bridging the gap between operational and informational technologies is crucial for future energy systems.

Pilot Project: The pilot will utilize new data centers in Attica, Cyclades, and Crete to explore greener data operations. It aims to align green energy production with the computational and data transfer needs of substations and data centers, using the GLACIATION platform to optimize data flow and computational load.

Expected Outcomes: The project seeks to provide insights into greener operations, optimize computational resources according to green energy availability, and improve the efficiency and resilience of the energy grid via smart IoT technologies.

Baseline Assets: Includes existing OT and IT infrastructures, integrated IoT devices across the grid, and newly established data centers in strategic locations to support the initiative.

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Key outcomes

- Optimized data movement across Cloud-Edge
- Eco-friendly, privacy-focused data transfer
- Reduced latency & enhanced privacy by keeping data closer to source
- Privacy & energy consumption as interconnected factors

Key Capabilities

- Lower environmental impact of data movement
- Energy profile measurement & representation
- Awareness of energy-efficient data operations

GLACIATION
Key Impact

- Supports Twin Transition (Green and Digital)
- Sustainable Cybersecurity Measures that support digital soveriegnty in edge environments
- Energy and Sustainability Improvements
- Enhanced Privacy Awareness and sustainability in Big Data
- Regulatory and Privacy Compliance
- Addresses Data Centre Energy and Sustainability Concerns
- Edge and IoT Integration
- Sustainability and Privacy in Smart Cities and Industry

GLACIATION

Thank you

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