

SODALITE releases an end-to-end IaC optimisation toolkit boosting the Digital Transformation of European Industry

The European Commission-funded project SODALITE just made available a complete set of software components to enable simpler and faster development, deployment, operation and execution of applications over heterogeneous software-defined infrastructures targeting multi-cloud, edge computing and HPC

January 13, 2022 – SODALITE Project funded by the European Commission under the Horizon 2020 Research and Innovation Programme is announcing the availability of its final results focused on the optimisation and performance of computer applications deployed and executed over diverse software-defined, high-performance cloud infrastructures. The final results will be delivered as per schedule since the project is ending its financing on 31st January 2022.

Since the beginning of the project in February 2019, SODALITE's main objective has been to address the challenges brought up by Digital Transformation and Cloud Computing trends, software tools and methods by developing a set of tools for efficient development, verification, deployment, and operation of applications.

In this sense, SODALITE provides a robust and powerful end-to-end toolkit to abstract application and infrastructure requirements with a particular focus on performance, quality, and reliability. Following a layered architecture approach, SODALITE tools provide specific advanced functionalities:

- **SmartIDE:** Shareable knowledge base and a semantic reasoners API which provides inputs and a DSL editor for the model-driven deployment of complex applications and concepts. It supports the specification of infrastructure resources, application deployments and their tuning for performance optimization.
- **FindIaCBug:** easily and interactively verifies the Infrastructure as Code (IaC) and detects errors, smells, antipatterns, and bugs, while providing useful recommendations on how to fix any detected quality issue
- **Mooring:** Ensures smooth deployment, orchestration, and provisioning of resources through a framework for Infrastructure as Code and modelling application deployment based on TOSCA and Ansible parameterized libraries.
- **REFIT:** Dynamic monitoring of systems and networks by collecting application-level and infrastructure-level metrics and events for reconfiguration and refactoring to alter deployment, quality and configuration of heterogeneous infrastructure resources used by the application.



- **POET:** Static and dynamic application performance optimization during design and runtime including manual profiling and tuning of application to the cloud and edge deployments based on HPC optimization.

SODALITE toolkit provides multiple benefits to application developers and infrastructure operators with tools:

- Increasing design and runtime effectiveness of software-defined infrastructures
- Ensuring high-performance execution over dynamic heterogeneous execution environments
- Increasing simplicity of modelling applications and infrastructures
- Improving manageability, collaboration, and time-to-market

To validate the performance, SODALITE tools were tested within three real-life scenarios:

- **Snow water:** Exploiting the operational value of information derived from public web media content with sophisticated Machine Learning techniques to assess and predict water availability coming from snow in the mountains of Lombardia.
- **Vehicle IoT:** Builds on ADAPTANT's KnowGo Car data management and services platform for connected vehicles which blends automotive and personal data for the creation of data-driven vehicle services.
- **In-silico clinical trials:** Assessment and decision-support system for spinal operations providing efficient data access from heterogeneous compute resources and simulation process chain facilitating comprehensive data analytics.

The SODALITE consortium is composed of nine multidisciplinary companies highly experienced in participating in research projects and driven by the development of advanced and innovative tools: XLAB – Project Coordinator (Slovenia), HLRS (Germany), Atos (Spain), Politecnico Milano (Italy), ADAPTANT (Germany), ITI-CERTH (Greece), Jheronimus Academy of Data Sciences (Netherlands), Hewlett Packard Enterprise (Switzerland), and IBM Research (UK).

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