Sodalite

SOftware Defined AppLication Infrastructures managemenT and Engineering

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H-Cloud Summit 2021

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SODALITE as a project

- H2020, 3 years (ending Jan 2022),
- 5.000.000 € budget
- 9 partners

SODALITE aims to provide an optimised, highly resilient heterogeneous execution environment enabling operational transparency between Cloud and HPC infrastructures.

SODALITE use cases

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In-silico clinical trials for spinal operations

Assessment and decision-support system for spinal operations consisting of a data store component, capable of providing efficient data access from heterogeneous compute resources and simulation process chain facilitating comprehensive data analytics for in-silico clinical trials.

Use case: Vehice IOT

The Vehicle IoT use case builds on ADTP's KnowGo Car data management and services platform for connected vehicles. KnowGo Car deals primarily with providing a blending of automotive and personal data to data-driven vehicle services on a basis of driver consent (enabled by the GDPR), while aiding the data service provider in managing their end-to-end regulatory compliance, including in cross-border service delivery.

Snow Water

An innovative tool demonstrator which enables the capillary observation of the continuous health status of mountain environments supporting social engagement of societies in software-aided continuous monitoring of Alpine regions.

The Realm of DevOps Tools

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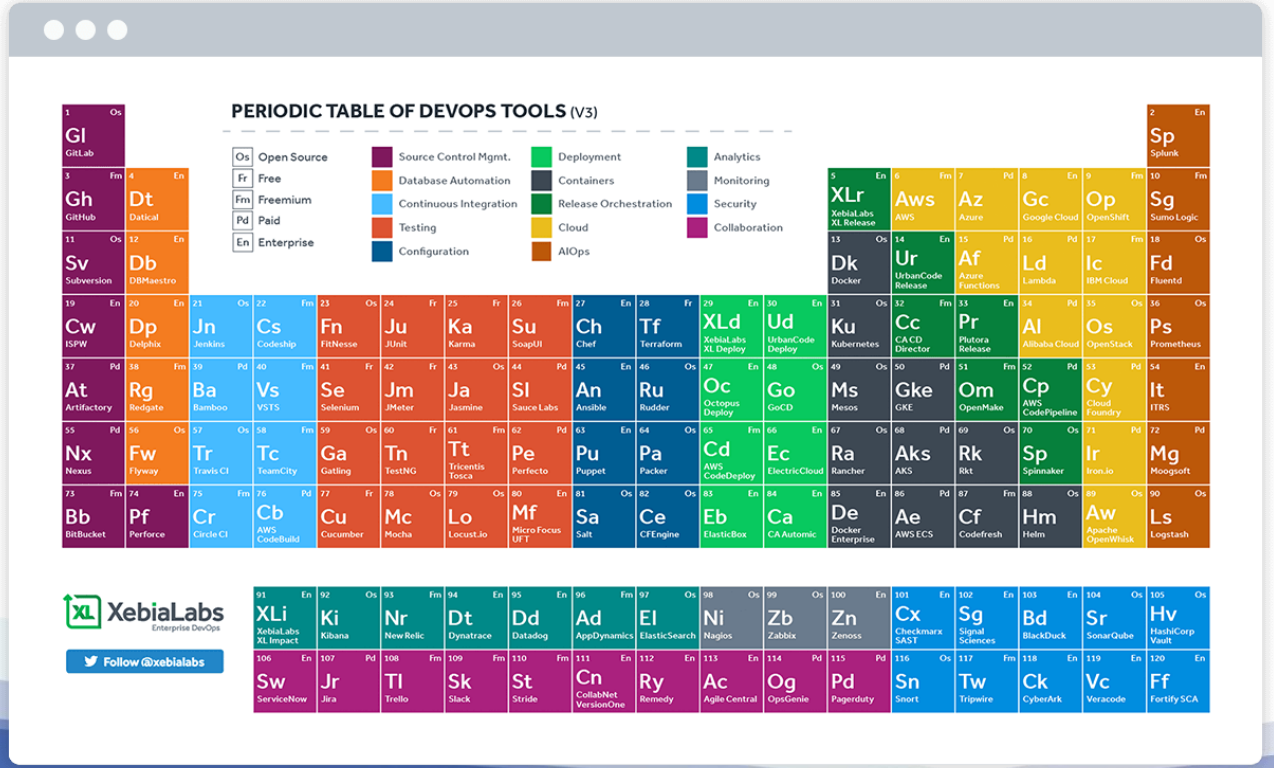

SODALITE Motivation

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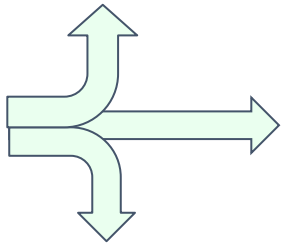
Complex applications

- Redundancy
- Fault tolerance
- High availability
- Performance monitoring and Observability

- Services
- Microservices
- Batch Jobs

- Cloud
- Edge
- HPC

Deployment of complex app topologies in heterogeneous infrastructures



HPC

PBS Works

slurm workload manager

Cloud

aws

openstack

Edge

kubernetes

Application assumptions

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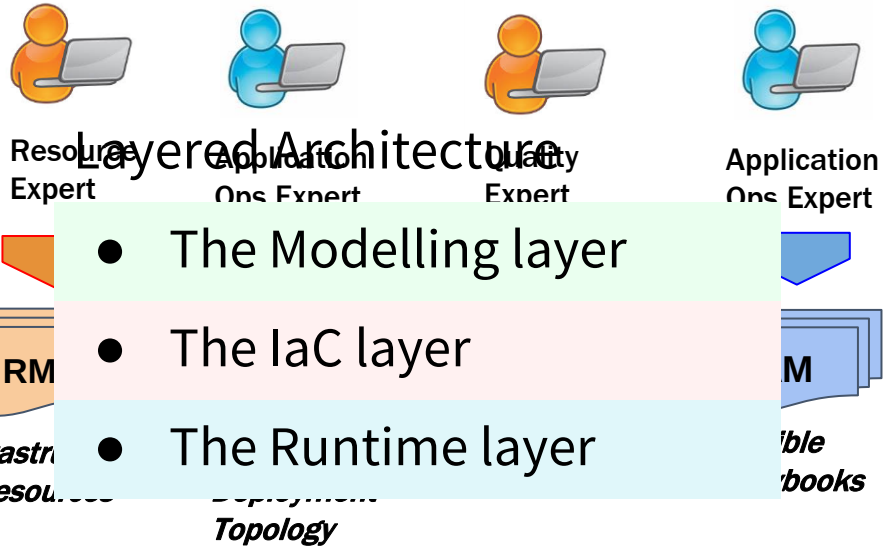
Application itself is a black box*.

The application must be configurable.

*** Support provided:**

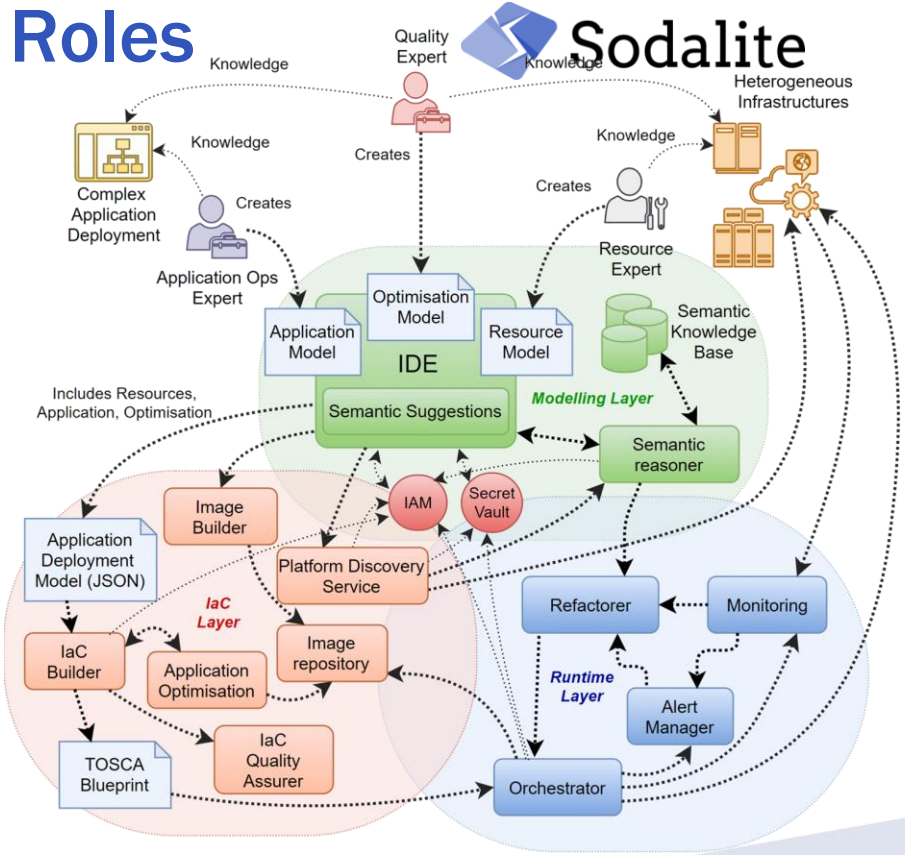
- **Where the environment may require specific libraries, we may provide such an environment.**

SODALITE Architecture & Roles



Layered Architecture

- The Modelling layer
- The IaC layer
- The Runtime layer



How do we do it in five bullets

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- Modelling / abstraction of application and resources
- Application is configurable & Infrastructure software-defined
- **Balancing abstraction weaknesses** during Modelling/Design and Runtime **with Knowledge-based Approach.**
- SODALITE is Strongly Knowledge-Based: Semantic Reasoning used for suggestions, smell detection, validation, performance optimisation.
- Complete life-cycle support through design, deployment, runtime management, undeployment

Collaboration

Requirements and Architecture

TOSCA

Semantic Abstractions Design and Modelling

MiICT
ICT ENABLED PUBLIC SERVICES FOR MIGRATION
ROBORDER
EOPEN beAWARE

IaC Management

CREST
COLLABORATIVE RESEARCH INTO EXASCALE SYSTEMWARE, TOOLS & APPLICATIONS
plan4res
EPiGRAM HS
MAESTRO
DATA ORCHESTRATION

Runtime Implementation

SLICENET
AADON
RestAssured
SECURE DATA PROCESSING IN THE CLOUD
TANGO

Water Scarcity UC
POLIMI

AADON

Clinical Trials UC
USTUTT

EGI

Vehicle IoT UC
ADPT

RestAssured
SECURE DATA PROCESSING IN THE CLOUD

Impact Generation

H-CLOUD

ReachOut!

AADON

Heterogeneity
Heterogeneous Hardware & Software
Alliance

HiPEAC

Conclusions

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- A complete system to guide the deployment and management of applications over heterogeneous infrastructure.
- Ensuring repeatability and easy transfer of applications between infrastructures.
- Focusing on performance of the deployed applications
- Containerisation performance addressed - important in all cases, especially in HPC environments.
- Standards compliant (AAI (Oauth2), TOSCA, etc.)

To follow:

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- Key results and exploitation roadmap
- Demo
- Use Cases
- Collaboration
- Discussion

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Thank you

https://twitter.com/SODALITESW

https://www.youtube.com/channel/UCrArVp55GaJs78jFt1lUfFg/videos

https://www.linkedin.com/company/sodalite-eu/

https://github.com/SODALITE-EU/