

NEW CLOUD SERVICES AND SOFTWARE FOR THE DIGITAL SINGLE MARKET

Minute Madness Flash Talks

Presenters to the front please!

ICT-06-2016: Cloud Computing

- **ACTiCLOUD** (Nectarios Koziris - National Technical University of Athens)
- **CloudDBAppliance** (Jacques Cayuela - ATOS)
- **CloudPerfect** (Paolo Fabriani - Engineering Informatica, Laboratorio Ricerca e Sviluppo)
- **COLA** (Tamas Kiss - University of Westminster)
- **DITAS** (David Garcia Perez - ATOS)
- **LightKone** (Peter Van Roy - Louvain Catholique University)
- **MELODIC** (Geir Horn - University of Oslo)
- **mF2C** (Ana Maria Juan Ferrer - ATOS)
- **RECAP** (Lutz Schubert - University of ULM)
- **RESTASSURED** (Paul Mundt - Adaptant Solutions AG)
- **UNICORN** (Spiros Alexakis - CAS Software AG)

ICT-10-2016: Software Technologies

- **COEMS** (Martin Leucker - Lubeck University)
- **CROSSMINER** (Philippe Krief - Eclipse Foundation)
- **DECIDE** (Leire Orue-Echevarria Arrieta - Tecnalia)
- **ELATEST** (Francisco Gortázar - Rey Juan Carlos University)
- **OPENREQ** (Luis Ballester - University of Hamburg)
- **STAMP** (Benoit Baudry - INRIA)

ACTiCLOUD: ACTivating resource efficiency & large databases in the CLOUD



Problem

Severe resource inefficiency in the cloud

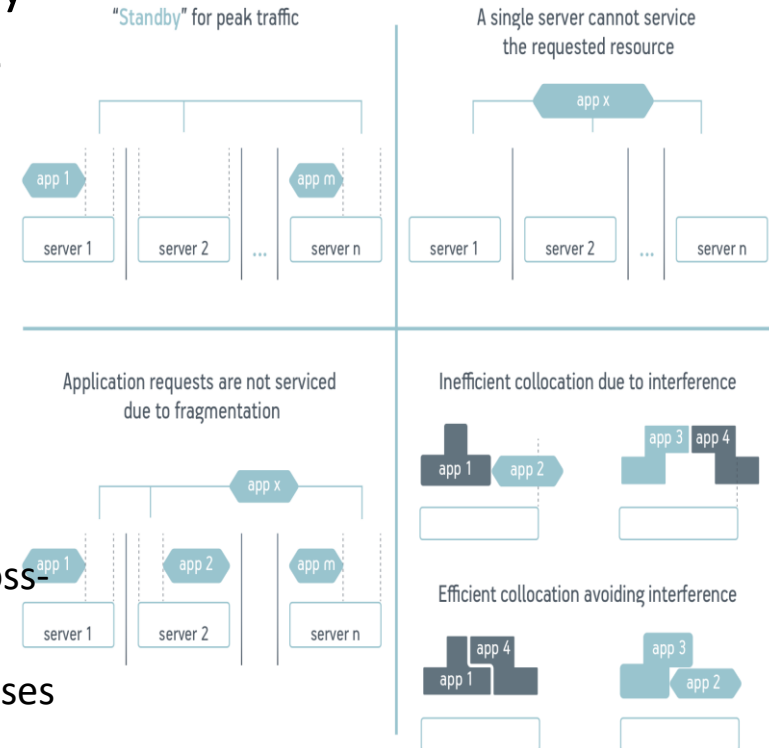
- Low utilization
- Unavailability
- Fragmentation
- Interference

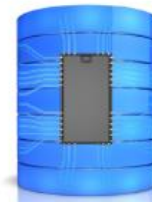
ACTiCLOUD Approach

1. Break the two critical barriers (server & datacenter)
 - Enable resource fluidity
2. Work across the entire stack
 - From the hypervisor to the application layer

Benefits & Impact

- Improved resource efficiency at rack, cloud-site & cross-site level
- Cloudification of resource-hungry, in-memory databases
- Enhanced services for IaaS, PaaS & DBaaS providers





CloudDBAppliance

European appliance with a leading-edge hardware platform, the new Bullion (very large memory **scale-up**) generation equipped with an **ultra-scalable operational database**,

- scale up linearly to 1,000+ cores
- real-time analytics** over the operational data

Performance and resilience of mainframes in cloud data centres

Value proposition for end users

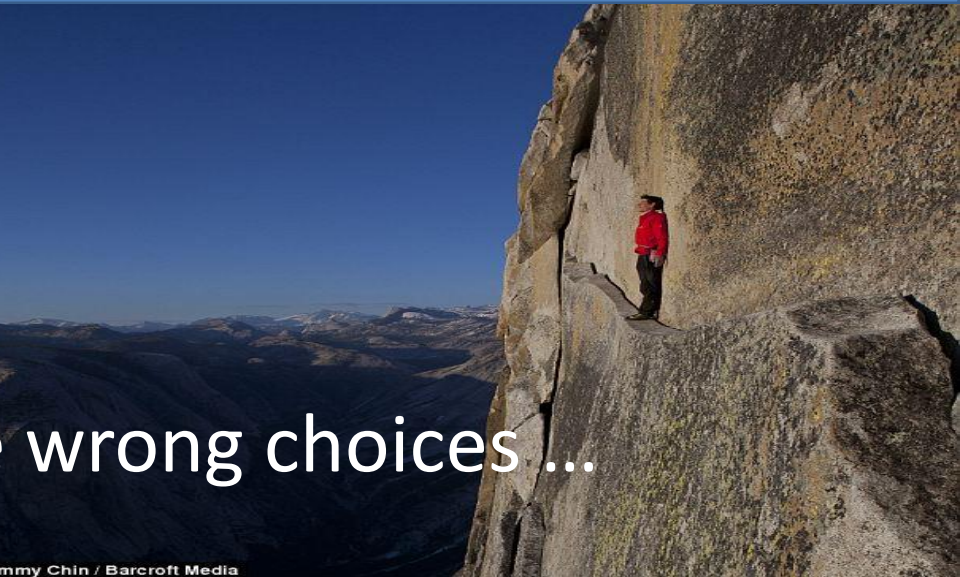
- Trusted and secured real time information**
- Availability**
- CloudDBAppliance requires less electricity and aircon**

Concertation meeting of H2020 projects from unit "Cloud and software"

28 June 2017 | NetFutures 2017, Brussels

Jacques CAYUELA ATOS/Senior Architect

CloudPerfect ... select the “*perfect cloud*” for you!



No more wrong choices ...

Jimmy Chin / Barcroft Media



Cloud performance rankings



Understand your application needs



Reliable and fast SLA monitoring



Clear and abstracted price/profit trade-offs

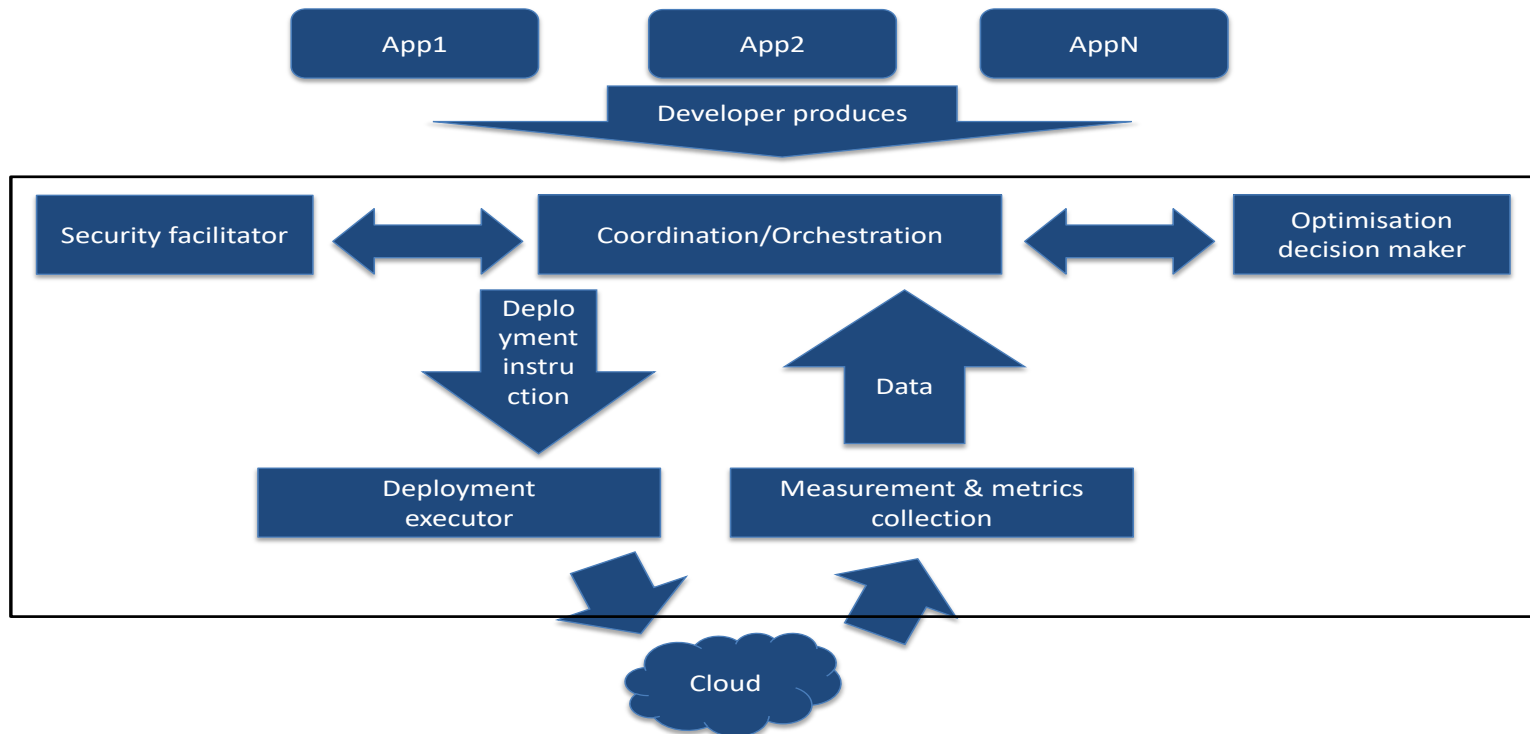


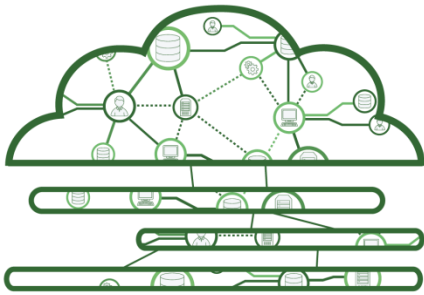
Avoid vendor lock-in

COLA

Cloud Orchestration at the Level of Application

- Define a generic pluggable framework that supports **optimal and secure deployment** and **run-time orchestration** of cloud applications.
- Pilot, demonstrate and validate the technical feasibility of the framework in **SME and public sector case-studies**.
- Validate **economic feasibility** of the implemented use-cases.
- Define common and widely applicable **application templates**.
- Provide access to **heterogeneous, federated and distributed cloud** resources.
- Develop solutions to address **security, reliability and trustworthiness**.
- **Maximise impact** by focused dissemination and marketing campaign.





DITAS

Data-intensive applications
Improvement by moving daTA
and computation in mixed
cloud/fog environments

Atos



IK4 IDEKO
Research Alliance

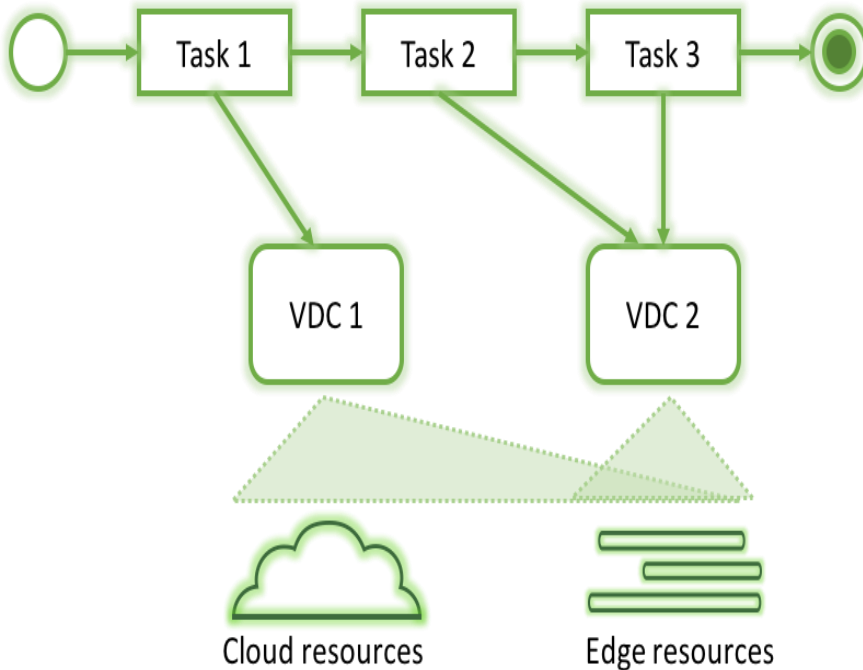


POLITECNICO
MILANO 1863

CloudSigma



IBM



To simplify the development of
data-intensive applications...

... proposing the concept of
Virtual Data Containers ...

... that take care of data movement
in a **Fog environment**



Horizon 2020

LIGHTKONE

lightkone.eu

- H2020 Project GA 732505, Jan. 1, 2017 – Dec. 31, 2019
- To execute large computations directly on the Internet’s edge
 - Including big data analytics and machine learning algorithms
 - Tolerating dynamic, unreliable, and heterogeneous networks
- Enabled by recent advances in distributed computing
 - **Convergent computation** (CRDT, Lasp): the simplicity of strong consistency combined with the efficiency of eventual consistency
 - **Hybrid gossip** (Plumtree, HyParView): efficient and resilient communication
- Software platforms under development
 - Lasp programming system lasp-lang.org
 - Antidote database antidotedb.org



- Partners and third parties

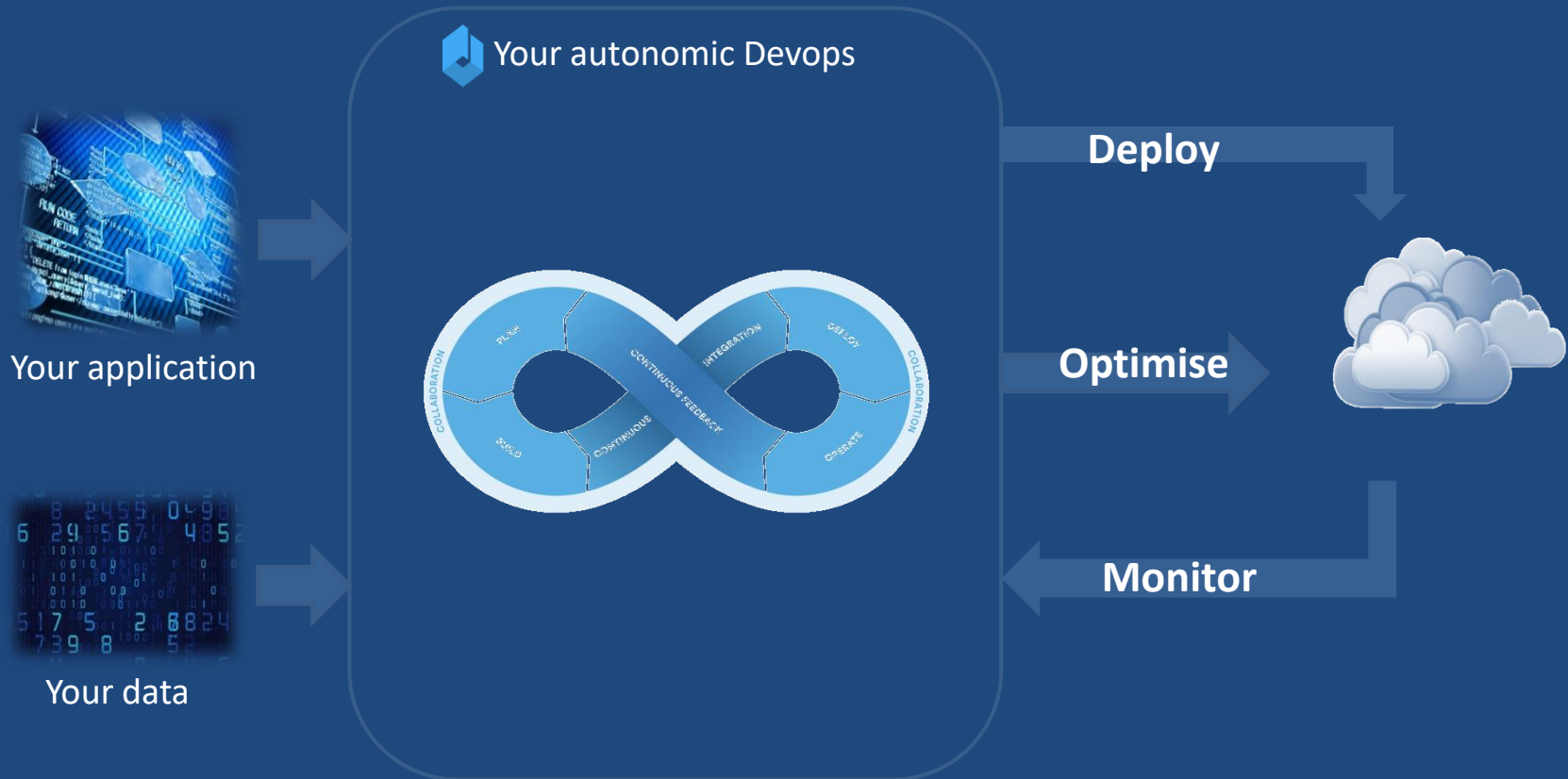
Université catholique de Louvain (coord.)	Gluk Advice B.V.
Université Pierre et Marie Curie + INRIA	Dipl. Phys. Peer Stritzinger GmbH
INESC TEC + Universidade do Minho	Scality
Technische Universität Kaiserslautern	Universitat Politècnica de Catalunya + fundació guifi.net
NOVA ID + Universidade Nova de Lisboa	



Melodic

Big data cloud

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731664



BIG-DATA CLOUD MADE EASY

Towards an Open, Secure, Decentralized and Coordinated Fog-to-Cloud Management Ecosystem

mF2C goal is to design and develop an open, secure, decentralized, multi-stakeholder Fog-to-Cloud (F2C) management framework.



Novel programming models



Privacy and security



Data storage techniques



Service creation



Brokerage solutions

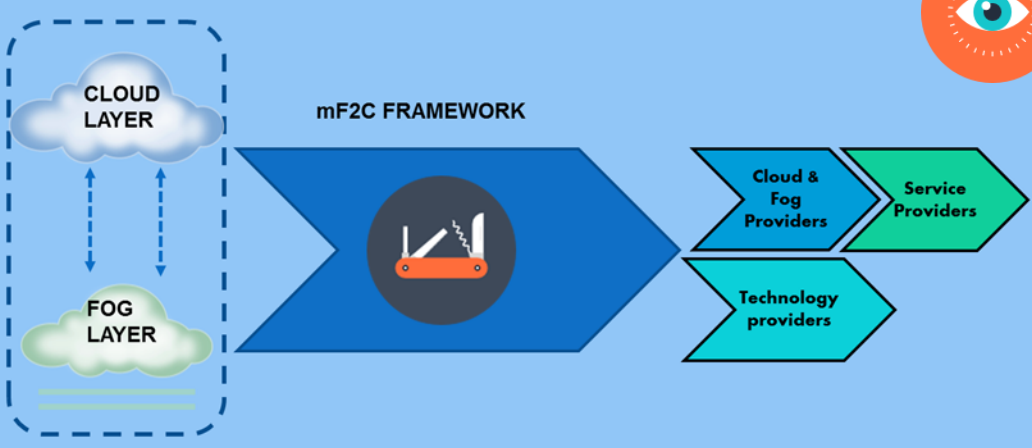


SLA policies



Resource Orchestration Techniques

FOG & CLOUD LAYER



Emergency Situation Management in Smart City



Enriched Navigation Service



Smart Fog-Hub Service



The RECAP project develops a radically novel concept in the provision of cloud services, where services are elastically instantiated and provisioned close to the users that actually need them via self-configurable cloud computing systems.

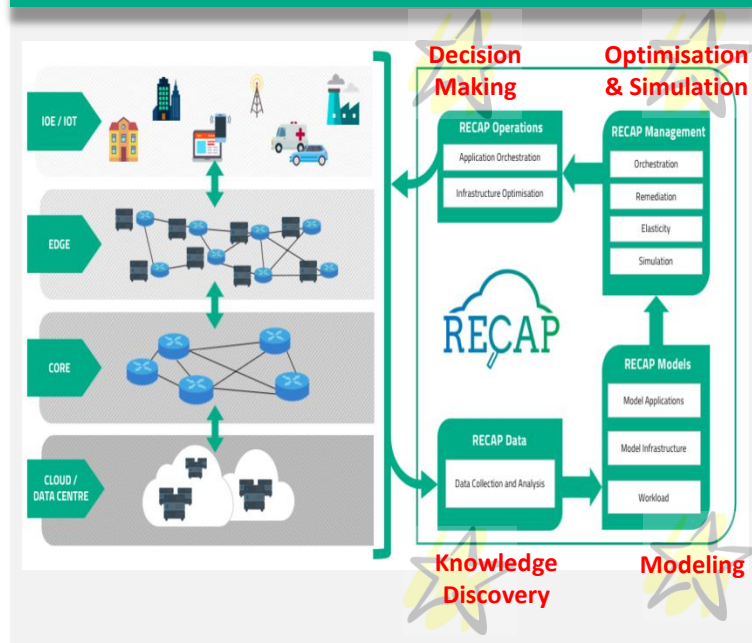


PROJECT MOTIVATION

- ❑ **Internet of Things (IoT)**
 - 10 billions of devices
 - Big Data
- ❑ **Large-scale Systems**
 - Distributed applications/components
 - Ubiquitous computing
- ❑ **Placement of Components**
 - Data centre: High latency+power
 - Fog/Edge: Low latency+power
- ❑ **QoS Requirements for Distributed Cloud Applications**
 - Fine-grained models



RECAP SOLUTION



BENEFITS FOR USERS

- ❑ **Efficient Data Collection & Analysis**
- ❑ **Intelligent Automation**
 - Automated Infrastructure and Application Modelling
 - Automated Cloud Infrastructure Optimisation
- ❑ **Simulations for Cloud Optimisation**
- ❑ **Reduced Transmission Costs**
 - Latency: ~5 times (expected)
 - CAPEX: ~4 times (expected)
- ❑ **Improved Resource Utilisation and User Satisfaction**

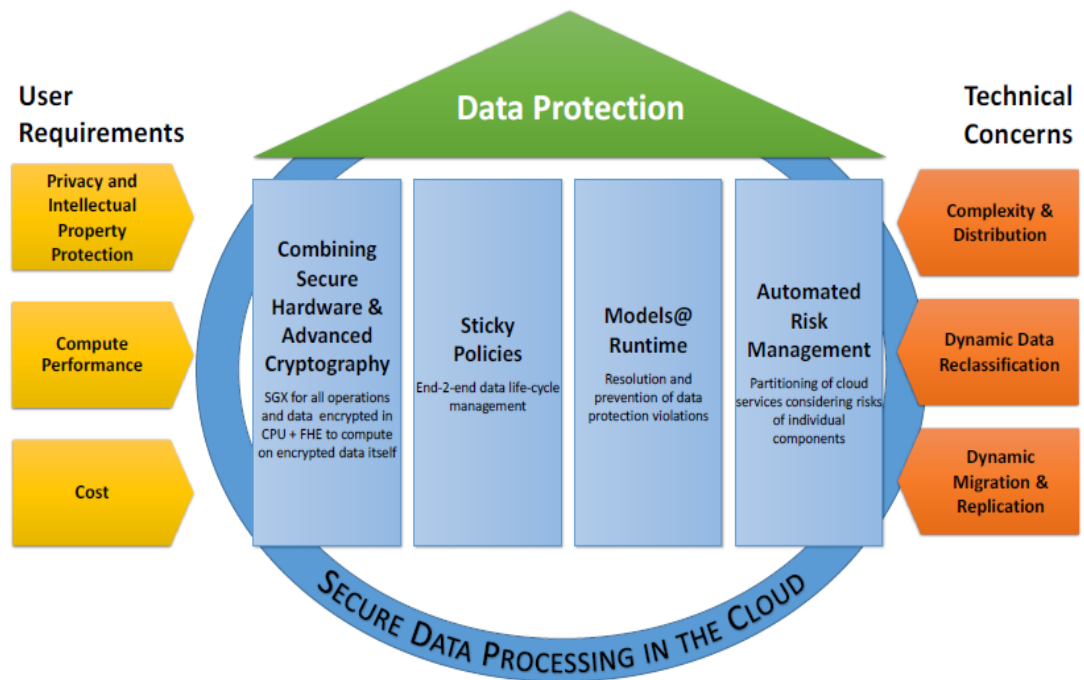
Increase trust in clouds through stronger security and data protection.

The applicability and usefulness of the RestAssured solutions are demonstrated through three use cases:

- **HPC** - High Performance Computing
- **PAYD** - Pay-As-You-Drive / Usage-based Insurance
- **CARE** – Self-directed Social Care

RestAssured empowers cloud providers and application developers to offer secure cloud services at competitive cost.

RestAssured assures the protection of sensitive business and citizen data in the cloud by combining four pillars of innovation:



Delivering a platform that facilitates the deployment of trustworthy applications and services creating a more *entrepreneurial* ICT ecosystem

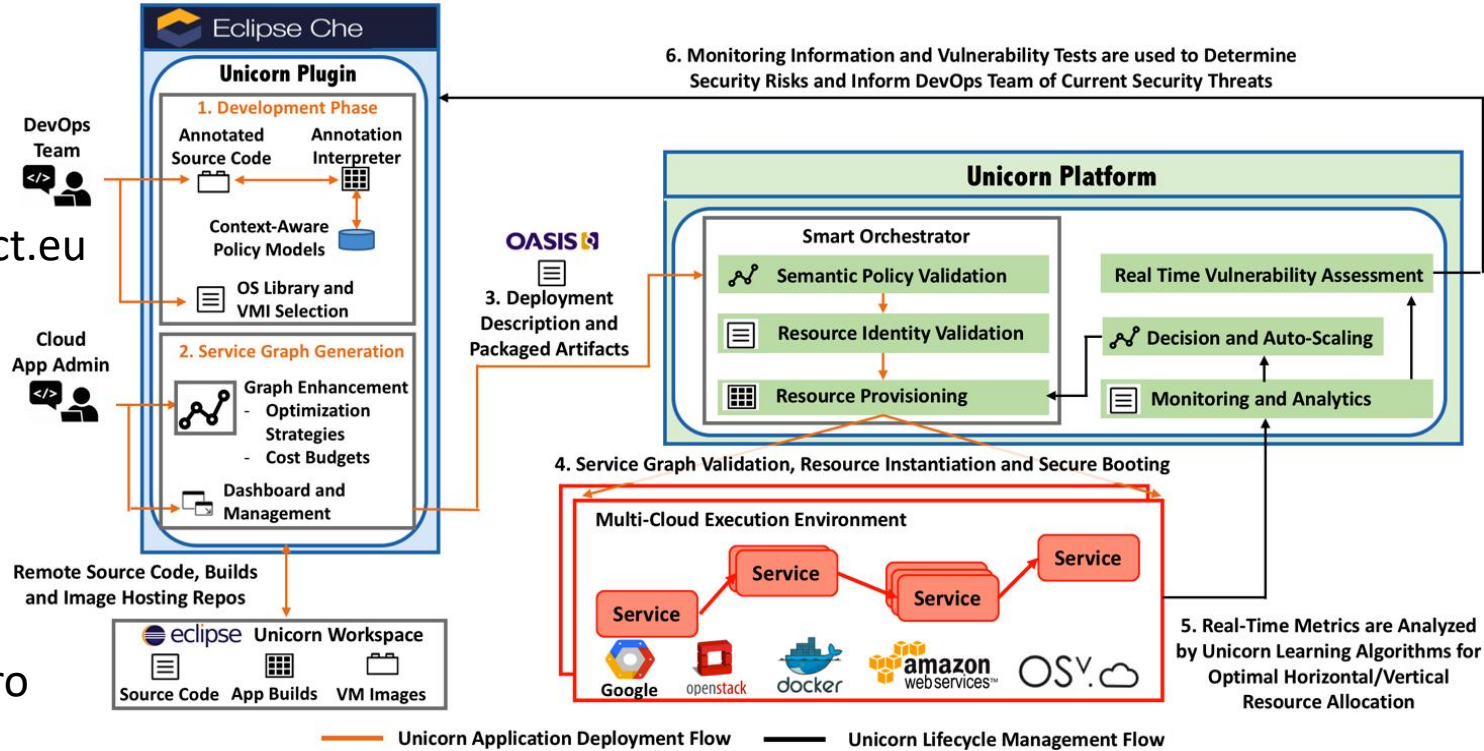


UNICORN

www.unicorn-project.eu



@unicorn_eupro

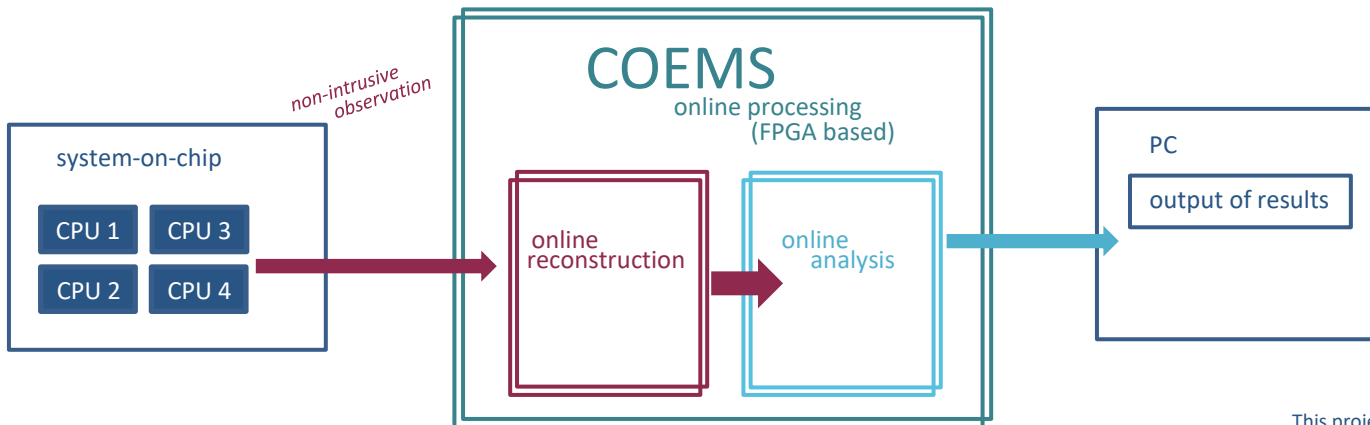
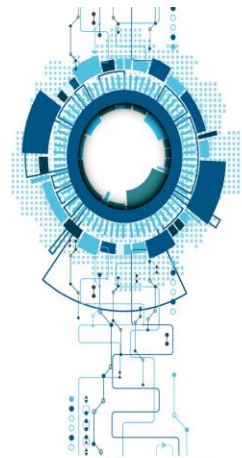


- Development and design libraries for secure and elastic –by design– multi-cloud services
- Continuous orchestration and automatic optimization of cloud services running on virtual instances or micro-execution containers
- Cloud IDE plug-in that incorporates a set of software code annotations, validation and packaging tools
- Eliminate source code vulnerabilities, providing continuous risk, cost and vulnerability assessment
- Facilitate the design and deployment of secure and elastic cloud applications and services.
- Improve developers’ productivity by reducing cloud application design time for security and portability allowing developers to focus on application core functionality

COEMS - Continuous Observation of Embedded Multicore Systems

The main idea behind COEMS is to reconstruct and analyze the program flow information (trace data) in real time.

ICT-10-2016
COEMS
Continuous Observation of
Embedded Multicore Systems



Consortium:

Universität
zu Lübeck
(DE)

Accemic
Technologies
(DE)

SC Thales
Systems
Romania SRL
(RO)

Thales
Austria
GmbH (AT)

Høgskulen
på Vestlandet



This project has received
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CROSSMINER

Developer-Centric Knowledge Mining from
Large Open-Source Software Repositories

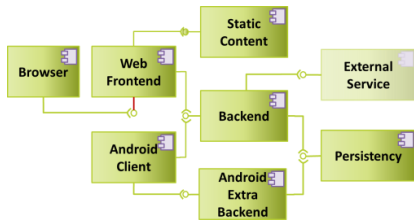
- Source Code Mining
- Text Mining
- Configuration Mining
- Knowledge Extraction
- Cross-Project Relationships
- Advanced IDE

Philippe Krief, PhD
Eclipse Foundation
philippe.krief@eclipse.org



Tools and mechanisms covering SDLC & SOLC, extending the current **DevOps** concept, offering:

ARCHITECT



Architectural patterns

OPTIMUS



Simulation at pre-deployment and selection of the most adequate topology

ACSmi



Ecosystem of reliable, interoperable and legally – compliant services

ADAPT



(semi-)automatic re-adaptation / monitoring of NFR of the app and of the MCSLA

Better



Maintenance

Better



Efficiency

Better



Productivity



Multi-cloud application developers and operators



Why ElasTest?

- **open source**
- reduces **maintenance costs**
- reduces **time-to-market**
- increases **quality** of software products
- **brings testing practices** from big cloud players to **everyone**

How we do it?

- easing **functional** and **non-functional testing**
- gathering **evidences**
- compliant with **current practices**
- **cloud-native** (vms or **containers**)
- **instrumentation**
- **real world conditions**

Requirements Engineering



Before OpenReq 



After OpenReq 

