OPEN & TRUSTED FOG COMPUTING PLATFORM

MANAGE SCALABLE, HETEROGENEOUS & SECURE IoT SERVICES

NEW FORMS OF CLOUD COMPUTING

ARE ALREADY BEING DEVELOPED, AND EUROPE IS CLEARLY TAKING THE LEAD IN THIS RESPECT. AN EXAMPLE IS 'FOG-COMPUTING', WHICH IS BASED ON FEDERATING THE COMPUTATION OVER A LARGE NUMBER OF MACHINES CONNECTED TO A NETWORK. THIS CAN BRING MANY ADVANTAGES, ESPECIALLY WITH REGARDS TO THE GROWING INTERNET OF THINGS..

- ROBERTO VIOLA, DIRECTOR-GENERAL DG CONNECT @EU_COMMISSION

RAINBOW CONSORTIUM

UBITECH ubiquitous solutions · TU WIEN · POLITECNICO DI TORINO · Πανεπιστήμιο Κύπρου University of Cyprus · DTU · ΑΡΙΣΤΟΤΕΛΕΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΟΝΙΚΗΣ

LINKS SMB · Infineon · INTRASOFT INTERNATIONAL · Suite5 We Deliver Intelligence · K3Y · uni.systems

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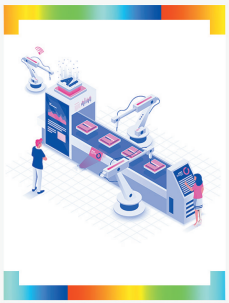
3 USE CASES

KPIs

- Decrease effort and investments for developing and managing the lifecycle of fog services and increase software delivery cycles speed
- Improved interoperability of cloud-based services used in fog and edge execution environment
- Improved efficiency and performance of fog nodes due to more efficient service development and orchestration
- Increased trust feeling of data and services relying on fog-based services and improved security and privacy guarantees
- Increased productivity of business applications which rely on, or can be developed based on fog computing services

Use Case 1



HUMAN-ROBOT COLLABORATION IN INDUSTRIAL ECOSYSTEMS

Indoor positioning for safety-critical industrial IoT requires the propagation of telemetry, positioning and trajectory data at millisecond range from hundreds of thousands of objects, human workers and robotic machinery.

Use Case 2

DIGITAL TRANSFORMATION OF URBAN MOBILITY

The goal of this use-case is to create a real-time geo-referenced notification system for vehicles traveling in urban areas about critical situations for the city mobility network, due to any possible cause (e.g., severe weather, failure of road infrastructure, etc.).

Use Case 3

POWER LINE SURVEILLANCE VIA SWARM OF DRONES

The introduction of drones for power line surveillance is still in embryotic state. However, using a swarm of drones presents the obvious benefit of reducing the total time required to scan the entire power line infrastructure,there are still significant challenges.

RAINBOW OBJECTIVES

01. FOG ARCHITECTURE

Provide an open and trusted fog computing reference architecture and highly relevant industry use-cases that facilitate the design, development and orchestration of scalable, heterogeneous, secure and privacy-preserving IoT services and cross-cloud applications, incorporating technological and business requirements coming from the industry, the research and academic community.

02. ORCHESTRATION, DATA COLLECTION & ANALYTICS

Provide a set of innovative mechanisms and middleware tools for IoT orchestration, data collection and decentralized analytics that guarantees network security, data protection, identity management and resource integrity. The key characteristic of the middleware will be the embedded intelligence and remote attestation mechanisms for establishing trust and QoS requirements while coping with performance and network uncertainties.

03. STORAGE & PROCESSING

Enable secure and efficient data storage and processing at the fog and edge layer and facilitate the extraction of high-level analytic insights by introducing novel decentralized algorithms and open APIs.

04. PROOF OF CONCEPT

Prove the applicability, usability, effectiveness and value of the RAINBOW integrated framework, models and mechanisms in industrial, real-life trustworthy services, applications and standards demonstrating and stress-testing the RAINBOW artIfacts, methodologies and services under pragmatic conditions against a pre-defined set of use cases.

05. COMMUNICATION & SCIENTIFIC DISSEMINATION

Ensure wide communication and scientific dissemination of the innovative RAINBOW results to the industry, research and international community, to realize exploitation and business planning of the RAINBOW design models, software kits and orchestration mechanisms, to identify end-users and potential customers, as well as to contribute specific project results to relevant open source communities.

VISION OF RAINBOW

TO DESIGN AN OPEN & TRUSTED FOG COMPUTING PLATFORM

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