ELASTIC

A Software Architecture for Extreme-ScaLe
Big-Data AnalyticS in Fog CompuTIng Ecosystems

Project Overview

"The ELASTIC project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement No 825473"

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Overview

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Project information

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Grant agreement ID: 825473

Status
Ongoing project

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EU contribution
€ 5 920 581,25

Coordinated by:
BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION

Spain

Partners

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

CITTÀ METROPOLITANA DI FIRENZE

GEST

ICE Information Catalyst
Services Data Software

ikerlan
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

isep Instituto Superior de Engenharia do Porto

sixsq

THALES

Motivation

- In current systems, when data analytics computation is moved to the cloud:
  - the processing time and energy cost is reduced, but the performance of the system is adversely affected, making it impossible to derive real-time guarantees
  - the level of security required increases to minimize potential attacks, which may end up affecting the safety assurance levels

Objectives

- To develop a **software architecture incorporating a new elasticity concept**, that will enable smart systems to satisfy the performance requirements of extreme-scale analytics workloads

- To significantly increase the capabilities of the extreme-scale analytics by extending the **elasticity concept across the compute continuum in a fog computing environment**

- To consider a realistic yet visionary **smart mobility use-case,** which will elaborate of huge amounts of data coming from a large set of IoT sensors distributed along the Florence tramway network

Vision

Reduced number of yearly accidents in Florence tramway
NGAP and ADAS

25%

Traffic improvement Public/Private
Transport interaction

5%

Reduced preventive & standard maintenance costs
Predictive maintenance

30%

Software Architecture

Sensors

Data collected from the city and the tramway vehicles

Communication Infrastructure

Data-Sets + Model Construction
(*Knowledge included in the datasets*)

Algorithms and Analytics Methods
(*Extract knowledge from the model*)

Analysis of Non-Functional Requirements

Distributed Data Analytics Platform

Orchestrator

Hybrid Fog Computing Platform

Compute Continuum

Use-case

- Smart mobility use-case in a real urban area in the tramway network of the City of Florence, Italy
  - Tram vehicles set up with V2X communication and various detectors
- Applications
  - Next Generation Autonomous Positioning (NGAP) and Advanced Driving Assistant System (ADAS) to detect obstacles
  - Interaction between the public and private transport to identify complications and improve local traffic regulation plans
  - Predictive maintenance to monitor the tramway operation in order to identify system failures in advance

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Thank you

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Stay tuned!

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