

CloudPerfect Project: Enhancements in Cloud Management and Performance Evaluation

Presenter: Ioanna Mesogiti

*Senior R&D Engineer, MBA, MSc
COSMOTE - Mobile Telecommunications S.A.
R&D Projects Department - Fixed & Mobile*

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- **Project Overview**
- **Main Objectives**
- **Technical Approach**
- **Architecture Overview**
- **Use Cases and Demonstration**



- **Area of Activity:** H2020
- **Period:** 1/Dec/16 – 30/Nov/18
- **Coordinator:** ENGINEERING – Ingegneria Informatica Spa
- **Partners:**
 - Universities (2x)
 - Industry Partners (5x)
 - Operators (1x)

Partners



CloudPerfect Main Objectives



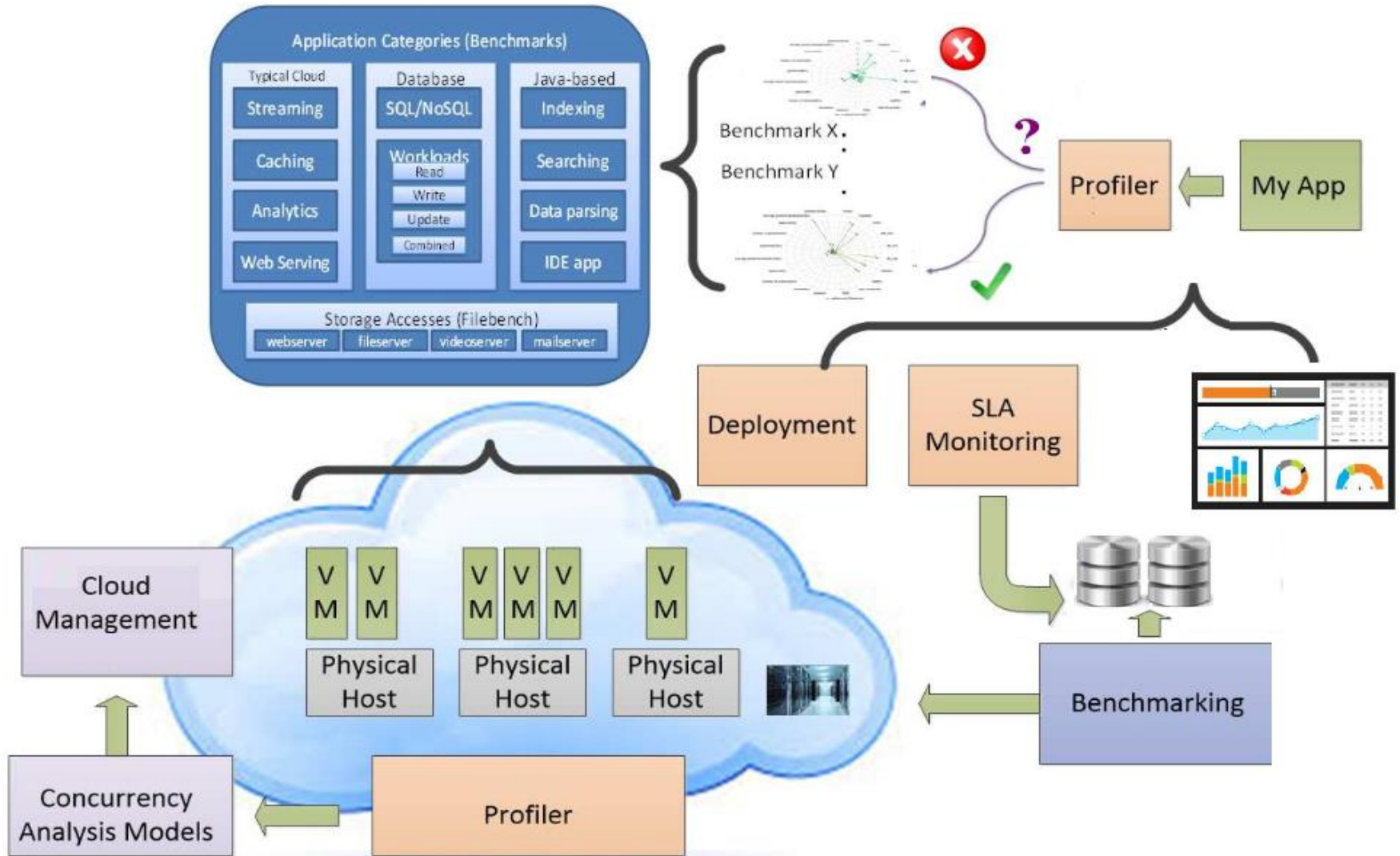
CloudPerfect aims to deliver an architectural approach and processes for:

- **IaaS/Cloud providers** to enhance the stability and performance of their infrastructures, through *applications modeling/profiling*, optimal *grouping of concurrently running services* and efficient *cloud resources management*.
- **Cloud adopters** (especially HPC and SaaS owners) to *estimate the resource requirements of their applications* more accurately, can minimize the cloud provider selection, procurement and deployment time by *having access to benchmarking data*, and can *monitor the maintenance of their SLA*.
- **3rd parties** to be enabled to act as independent validators of IaaS offerings, through a *constant monitoring and benchmarking process*.



- The CloudPerfect Architecture relies on a number of toolkits and on the logical grouping between complementary components included in these toolkits.
- Three primary toolkits have been defined:
 - The **Cloud Adopter toolkit**
 - The **IaaS Provider toolkit** and
 - The **QoE Entity tools**, enabling service performance statistics retrieval and IaaS providers' benchmarking.
- Each toolkit consists of a subset of the following functions:
 - Application Profiler
 - Concurrency Analysis models
 - Cloud Management and Deployment Service
 - SLA Monitoring Agent
 - Benchmarking Suite

Technical Approach (2/2)



Architecture Overview



User Level



Typical IMT GUI

Presentation FG

Operation UI

Presentation UI

Profiler UI

Cloudiator UI

IaaS Provider

QoE

Adopter

Intelligence FG

Prediction Model

Classifier

Application Optimizer

IaaS Management FG

IaaS Service API

Linking Layer FG

Queries Definition

User Management

Agent Repository

Agent deployment

Provider Selection FG

Profiler

Bench Tools

Classifier

Recommender

App Preparation FG

Virtual Appliance Creation

Control Management Logic

Monitoring FG

Profiler

Storage

Baseline Monitors

Actuation FG

Bench Tool

Allocation Enforcer

Runtime FG

Data Storage

Agent Operation

Authorization Management

Cluster Operation

App Deployment FG

Virtual Appliance Repository

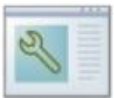
Deployment Manager

App Runtime FG

Runtime Manager

Actions Enforcer

Toolkit Level



IaaS Management Toolkit



Psychical Node Psychical Node Psychical Node

Cluster Management Toolkit



Psychical Node Psychical Node Psychical Node

Ad-Hoc UC Dependent Management



Psychical Node Psychical Node Psychical Node

Infrastructure Level





- Three Use Cases will be demonstrated in 3 different testbeds provided by UULM (Germany), ENGINEERING (Italy) and COSMOTE (Greece).
- **IaaS Provider resource allocation and performance optimization**
- **SaaS/Application owner Provider selection and application deployment & monitoring**
 - Provision of Services with High Computational Demands (Computational Fluid Dynamics)
 - Provision of Business Operation Services (CRM/ERP services)

Thank You!



CloudPerfect Project

Project coordinator: Matranga Isabel
Engineering Ingegneria Informatica S.p.A.

Project website: <https://cloudperfect.eu/>
Twitter: https://twitter.com/cloud_perfect