



CloudDBAppliance

CloudDBAppliance aims at creating an appliance with an ultra-scalable operational database with analytical capabilities leveraging a new ultra-efficient storage engine able to scale up to the next Bullion generation with 800 cores.

AT A GLANCE

Project title

CloudDBAppliance: European Cloud In-Memory Database Appliance with Predictable Performance for Critical Applications

Project coordinator

Bull Atos/BDS, France

Partners

Bull, France
LeanXcale, Spain
ActiveViam, France
BTO, United-Kingdom
WindTre, Italy
IKEA, Greece
INESC, Portugal
Univ. Politecnica de Madrid, Spain
Inria, France
CloudBiz, Greece
Singular Logic, Greece

Duration

01.2017 – 12.2017

Total cost

4.830.000 €

EC Contribution

1.000.000 €

Programme

ICT-06-2016: Software Technologies

Context and motivation

Many applications are being migrated to the cloud because of its convenience and ease of use. However, there is still a subset of applications, which are not widespread in the cloud. They are mainly data-intensive and time critical applications.

Data intensive applications, if ever migrated, experience bad performance in the cloud as current cloud database infrastructure fails to satisfy high loads and does not provide predictable performance. The lack of predictable performance, in turn, leads to inability of time critical applications to satisfy strict Service Level Agreement (SLAs) requirements imposed on them.

Challenge

Many of today's critical applications run on mainframes due to their high resilience and high performance. Unfortunately, there is no equivalent to them in the cloud till today.

This is precisely the vision of CloudDBAppliance: creating a cloud database appliance, which can replicate the performance and resilience of mainframes in cloud data centres. The goal is not only to match their



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performance and resilience, but also to expand their current capabilities.

Solution

New Bullion generation: the new hardware platform being built by Bull able to reach 800 CPU cores, 140 TB of main memory along with new NVMe and GPU accelerators technologies in a single computer.

LeanXscale ultra-scalable Full SQL Full ACID database: A new version of LeanXscale to scale up linearly at the scale of the new Bullion.

LeanXscale ultra-efficient Full ACID key-value data store: LeanXscale's KiVi ultra-efficient storage engine redesigned to scale up efficiently in many-core NUMA servers such as the new Bullion.

ActivePivot in-memory MOLAP: A new version of ActivePivot redesigned to be able to scale up to the dimension of the new Bullion. It will be integrated with LeanXscale to provide analytical query support over operational data.

Real-Time Analytics: A new set of algorithms that compute analytics in a continuous and/or incremental manner over data stored in LeanXscale.

Ultra-Scalable Data Streaming: A new data streaming engine able to scale up very efficiently in the Bullion and integrated

with LeanXscale DB and KiVi to enable real-time correlation and/or update of operational data with the streams at very large rates, in the order of millions of events per second.

Operational Data Lake: LeanXscale database will be integrated with Bull's Hadoop/Spark data lake to provide an operational data lake, that is, a database providing operational capabilities and enabling correlation with historic data stored in the data lake.

Expected impact

CloudDBAppliance will deliver a European appliance with a leading-edge hardware platform, the new Bullion generation equipped with an ultra-scalable operational database, LeanXscale boosted with its ultra-efficient storage engine able to scale up linearly to 1,000+ cores and integrated with ActivePivot that will provide real-time analytics over the operational data of LeanXscale.

The CloudDBAppliance outcomes will be validated through five real industrial use application scenarios in three verticals: Finance/Banking: **Real-Time Risk Analysis, ATM Optimization,** Telco: **Cell phone number mobility,** Retail: **Proximity marketing and real-time pricing.**

