



# CoherentPaaS

Coherent and Rich PaaS with a  
Common Programming Model

ICT FP7-611068

## NoSQL data store final implementation

D5.3

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**More information**

Additional information and public deliverables of CoherentPaaS can be found at: <http://coherentpaas.eu>

# 1 Executive Summary

CoherentPaaS aims at integrating different SQL and NoSQL data stores in a single cloud PaaS, under a Common Query language and a scalable transactional management system across stores. This report discusses the required enhancements to the NoSQL data stores to enable their integration with the Common Query Language, CloudMdsQL, and the transactional stack.

The NoSQL data stores that are integrated into CoherentPaaS are the document data store MongoDB, the key-value data store H-Eutropia, and the graph database Sparksee. The appropriate enhancements performed for each store are:

- In MongoDB, its multiversion concurrency control mechanism is altered by storing the private write-set of each transaction into the data store storage, instead of keeping it in-memory. This created the benefit of relying in MongoDB native rich query engine for executing selections, while also reducing the memory space needed for the execution of an application. The integration with the Transactional Manager is completed and MongoDB can now handle concurrent transactions and ensure ACID semantics. Finally, MongoDB is integrated with the Common Query Engine (CQE) by implementing a wrapper that receives queries written in the CloudMdsQL language and transforms them to MongoDB's native language for execution.
- In H-Eutropia, the cloud data store resulting from the integration of Eutropia key-value data store with HBase. H-Eutropia replaces HBase storage back end with Eutropia key value store described in D5.1 targeting clusters equipped with fast storage devices. In the prototype that corresponds to this report, Eutropia is fully integrated with HBase supporting its put/get/scan API. It supports versioning, which is necessary for the integration with the transactional stack, it implements the appropriate functions for scalability, and it provides the appropriate wrappers for the integration with CQE.
- Finally, Sparksee graph database has applied the appropriate modifications to support versioning. It is now fully integrated with CoherentPaaS transactional stack and with CQE through the development of the corresponding wrapper.