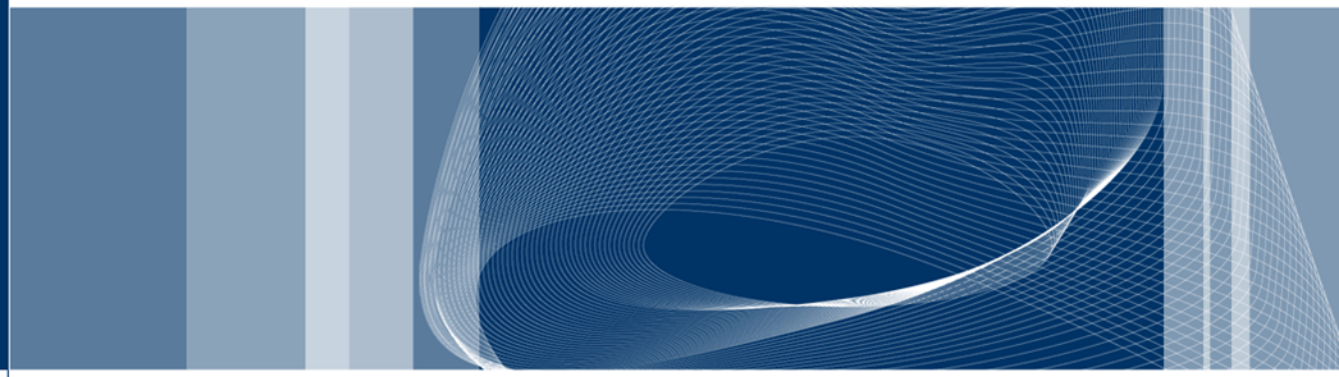
POLITECNICO DI MILANO

Scuola di Ingegneria Industriale e dell'Informazione

Corso di Laurea Magistrale in Ingegneria Informatica

Anno Accademico 2013 - 2014



Avoiding CRUD operations lock-in in NoSQL databases: extension of the CPIM library

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Tecnologie per la gestione dei dati

NoSQL

- Dati non strutturati
- Grande volume di dati
- Horizontal scaling
- Nessun linguaggio standard
- BASE properties

RDBMS

- Dati benstrutturati
- Vertical scaling
- SQL
- ACID transaction

Approcci per un linguaggio standard

Meta-model

- Apache MetaModel
- SOS platform

SQLification

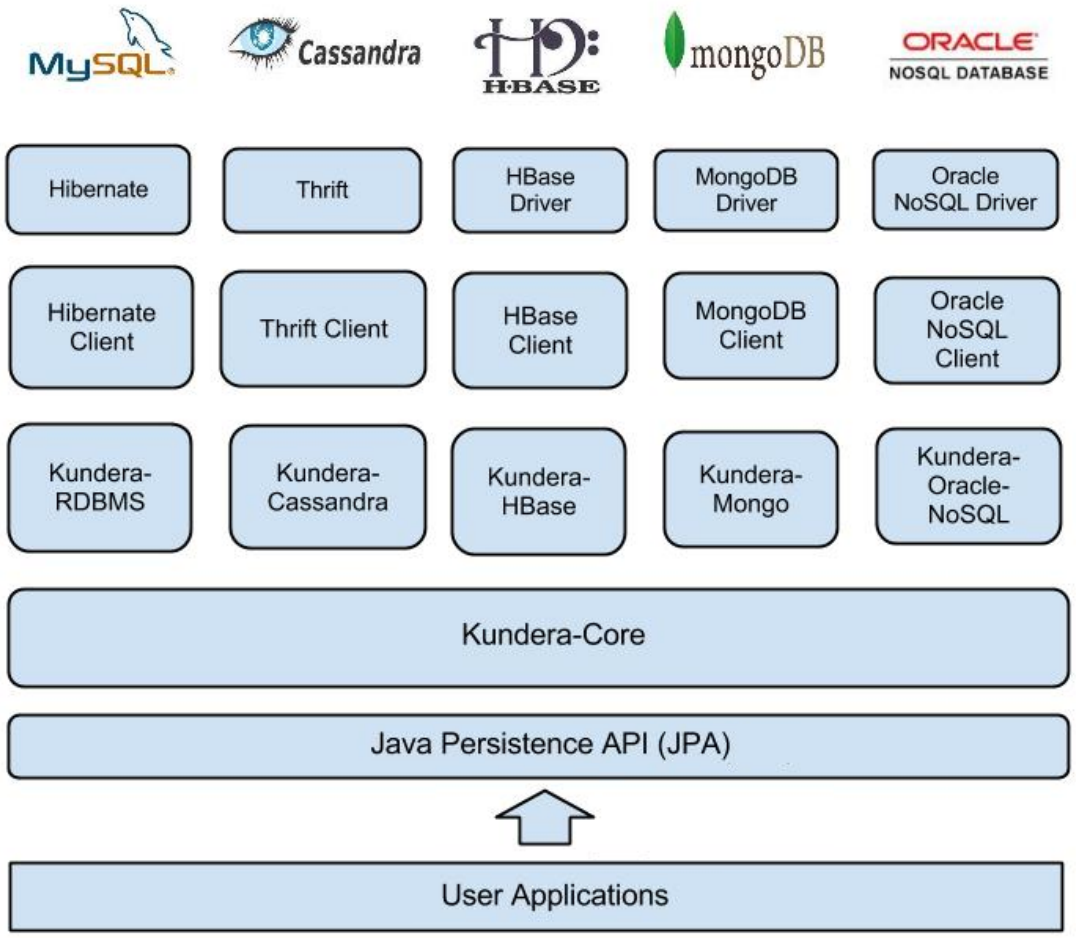
- Apache Phoenix
- UnQL

ORM

- Kundera
- PlayORM
- Spring-data
- Apache Gora

Kundera

A JPA 2.1 compliant ORM Library for NoSQL databases

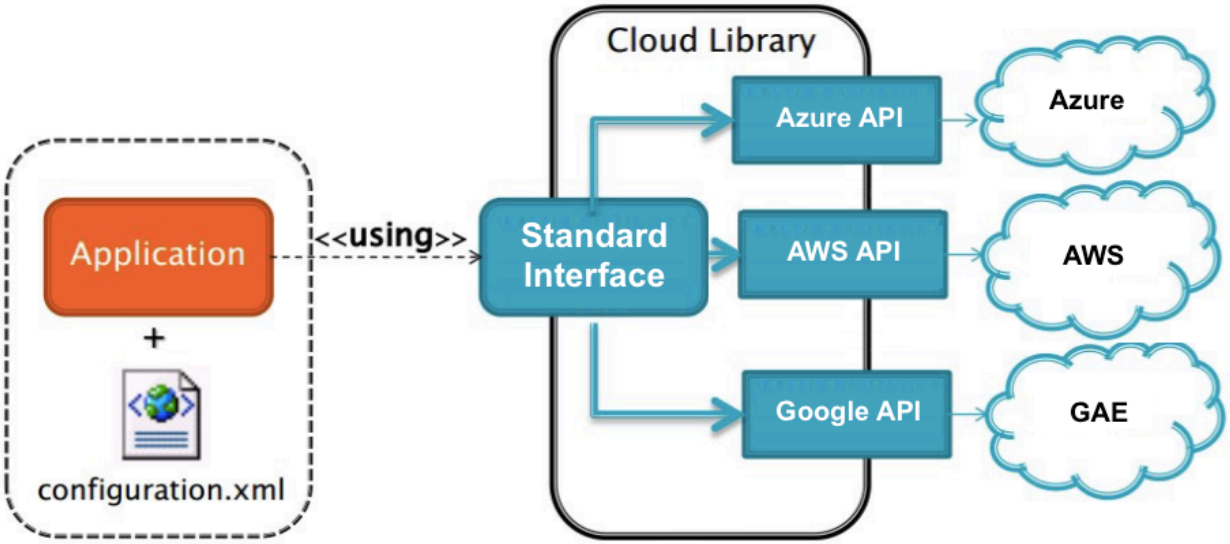


Cloud Platform Independent Model

Abstract application logic from the specific PaaS Provider to overcome the vendor lock-in

Many supported services:

- Blob
- NoSQL
- Memcache
- Queue
- Mail
- SQL



Obbiettivi del lavoro

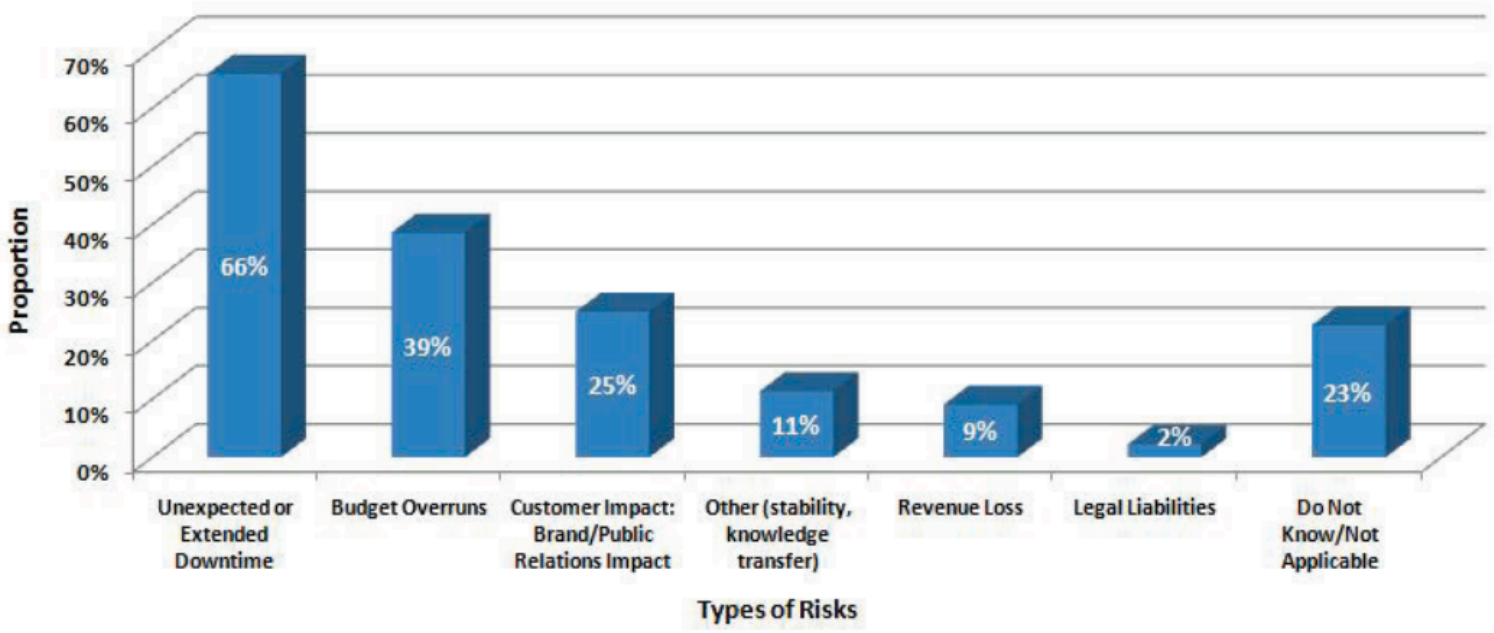
- Integrazione di Kundera in CPIM
  - estensione del numero di NoSQL supportati
  - fix dei problemi del servizio NoSQL

- Contribuire a Kundera come progetto open-source:
  - sviluppo di un client per GAE Datastore
  - sviluppo di un client per Azure Tables

- Supportare migrazione dei dati tra database NoSQL attraverso Hegira

Data migration

- Move application to another cloud provider
- load balancing, system expansion, failure recovery, etc.
- modern computer systems are expected to be up continuously
- data synchronization between the two involved systems



Perché Kundera

- Open source
- Modulare, sviluppata con l'obbiettivo di essere estendibile
- Ploygot persistency
- Nel campo dal 2010 con una community attiva
- Utilizzato in production
- Supporto a molti diversi database NoSQL

Sviluppo client per Kundera

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Integrazione Kundera in CPIM

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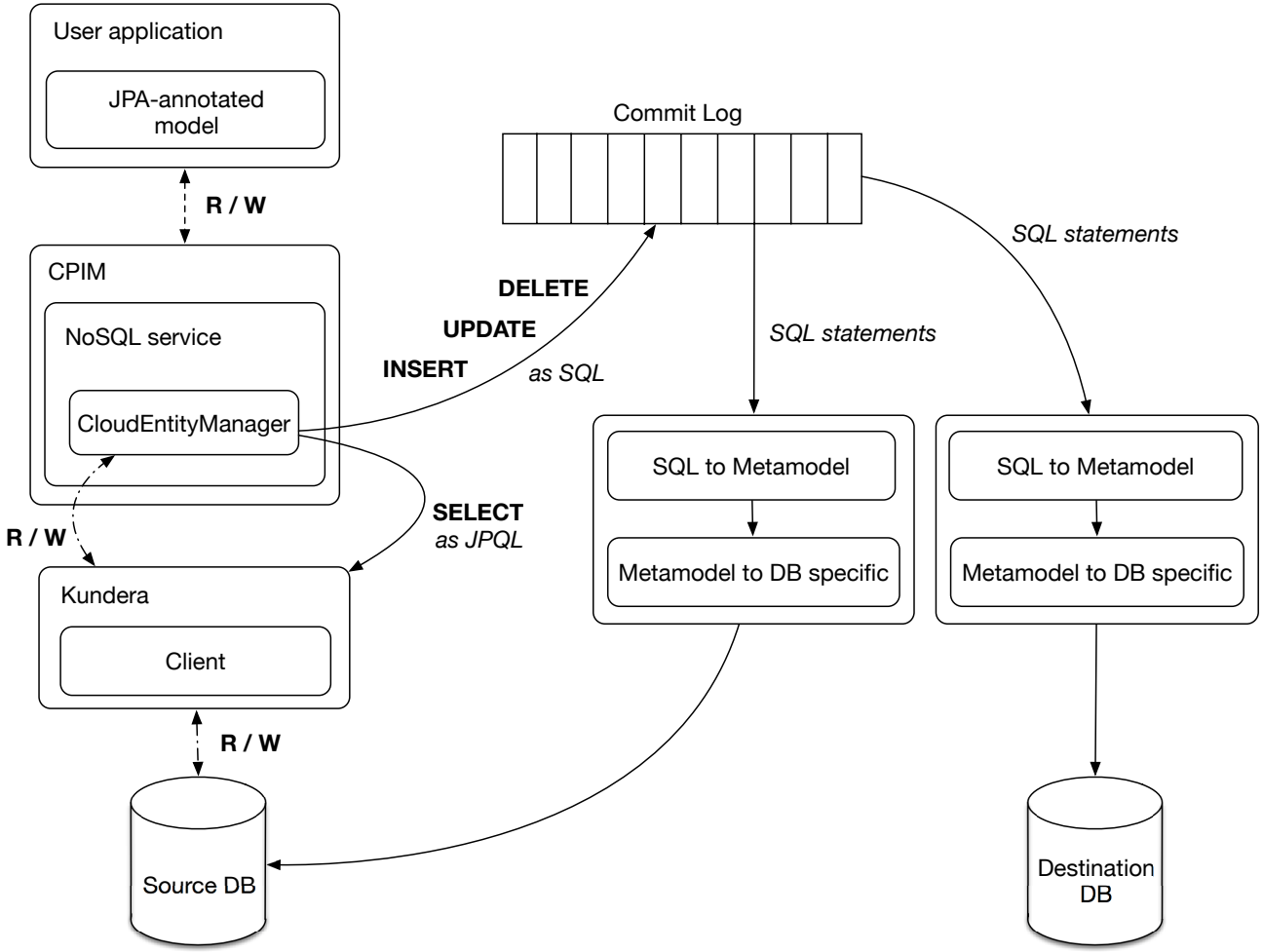
Supporto a Hegira

Servizio di migratione, attraverso Hegira, in modo trasparente all'utente della libreria CPIM



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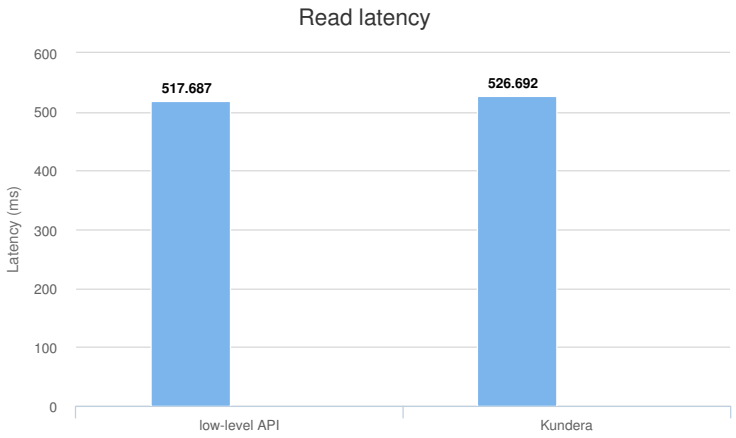
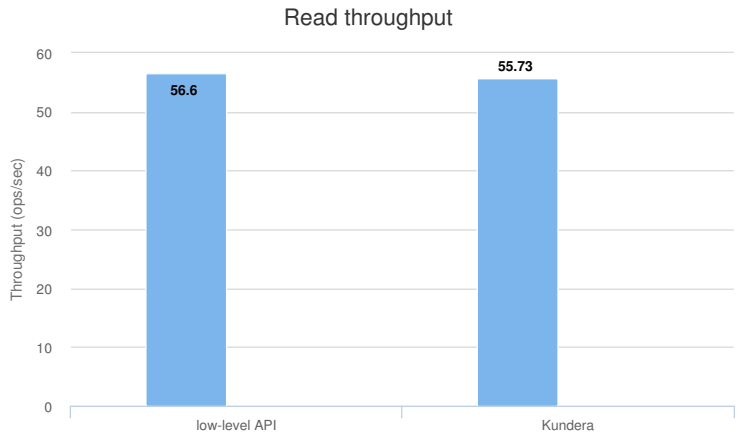
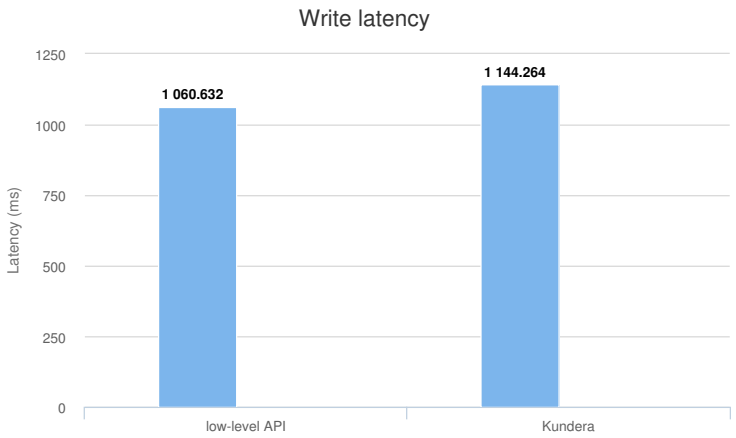
Performance

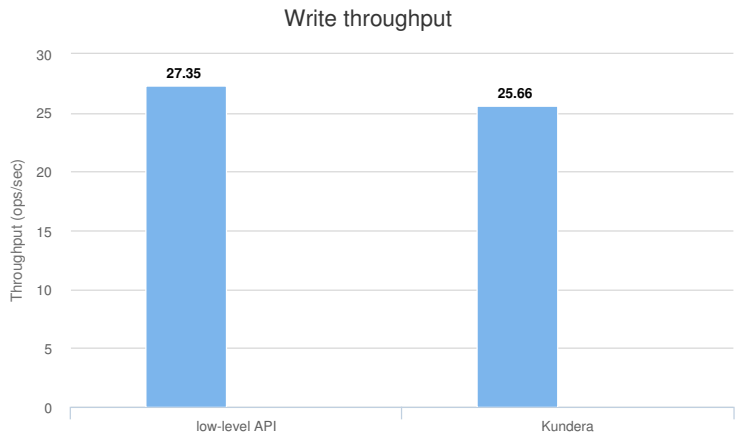
Test di performance utilizzando YCSB (Yahoo Cloud Serving Benchmark) sui client di Kundera sviluppati

Azure Tables results

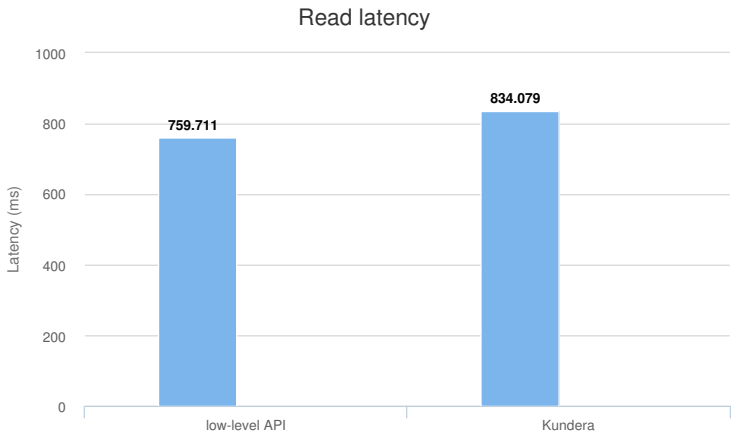


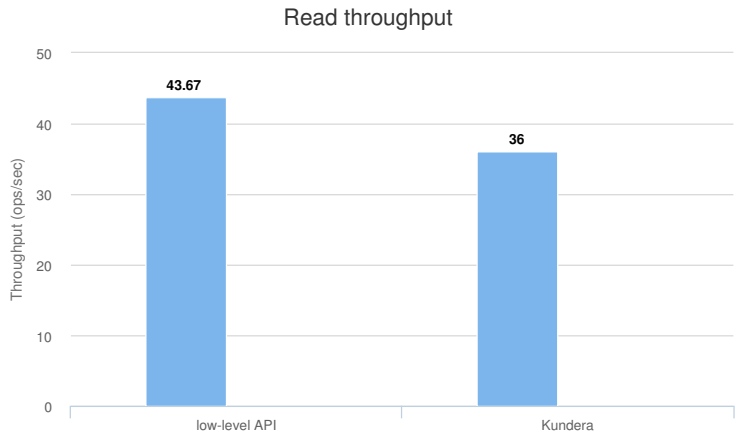


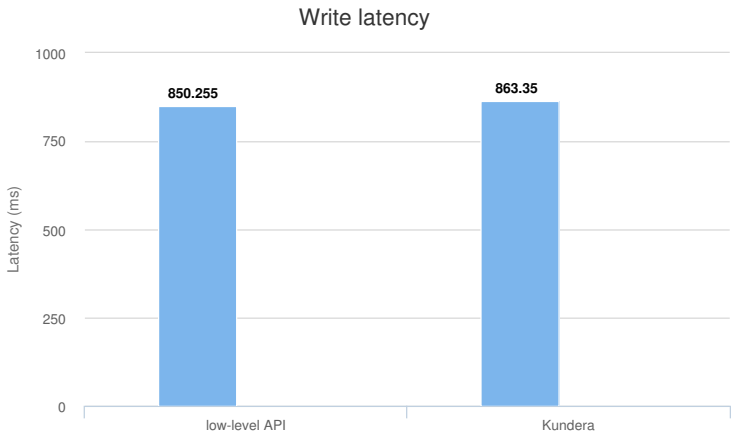


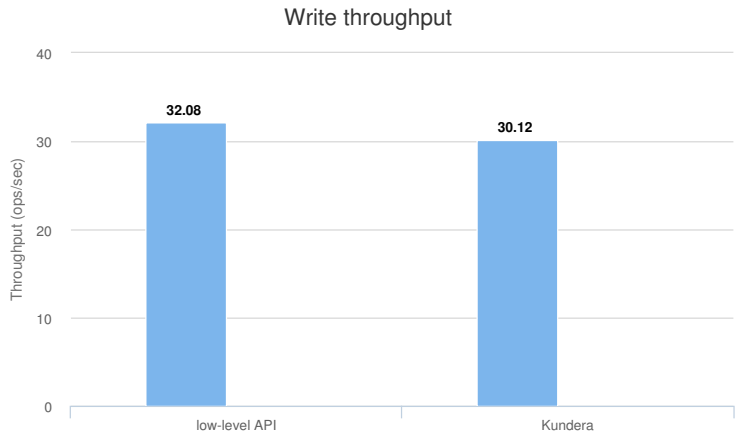


GAE Datastore results









Conclusioni

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