SOA LIGHTNING TALK

THE DATABASE-IS-THE-SERVICE PATTERN FOR MICROSERVICE ARCHITECTURES

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CONTEXT OF THE RESEARCH

WHO ?

Instituto di Calcolo e Reti ad Alte Prestazioni

Parlemo (Italia)

- Cognitive systems and robotics
- Knowledge representation
- extraction and reasoning
- Human-computer interface
- Cloud computing
- Parallel and distributed environments

Application in : e-health, energy, security, bioinformatics, cultural heritage, smart cities

WHAT ?

- Microservice architecture vs Monolith Architecture
  - External database versus Database as complete service
- Health Record Application
- Former ebXML monolith application

RESEARCH CHALLENGE ADDRESSED BY THE AUTHORS

CHALLENGES

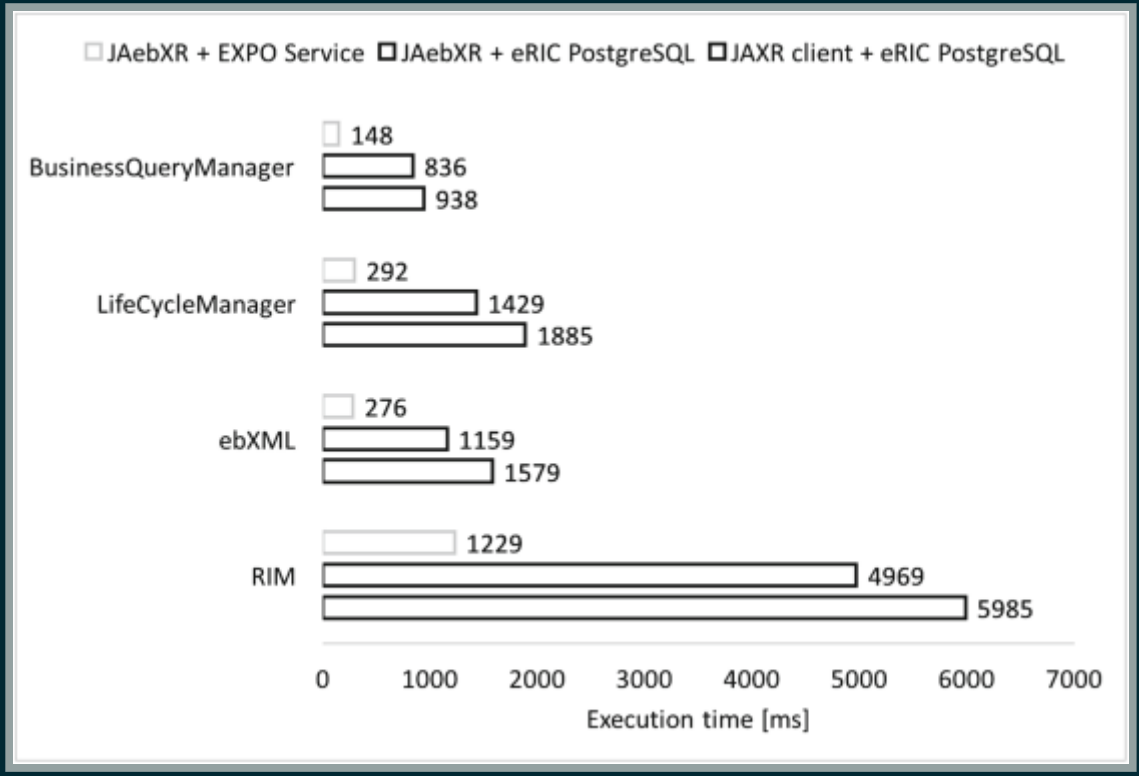
- Complexity reduction
  - Deal with "conservation law"
- Performance improvement
  - Data access simplified
  - Single Responsibility Principle
  - Bottleneck effect reduction

FROM MONOLITH TO MICROSERVICE (FROM DATA PERSISTENCE POV)

- Functional decomposition of an application
  - Leads to independent and specialized persistence layer
- Service registration
  - Server-side
  - API-Gateway ?
- Multiple persistence strategies
  - Private-tables-per-service
  - Schema-per-service
  - **Database-server-per-service**

RESULTS OBTAINED

BENCHMARK


JAebXR + EXPO Service
JAebXR + eRIC PostgreSQL
JAXR client + eRIC PostgreSQL
BusinessQueryManager
148
836
938
LifeCycleManager
292
1429
1885
ebXML
276
1159
1579
RIM
1229
4969
5985
0
1000
2000
3000
4000
5000
6000
7000
Execution time [ms]

THREATS TO VALIDITY & ANALYSIS OF THE OBTAINED RESULT

THREATS TO VALIDITY

- Quid of the possible network lag ?
  - Considered as negligible during the experiment
- Questionable comparison : Monolith + SQL vs Microservice + NoSQL

ANALYSIS OF THE OBTAINED RESULT

- Execution time gain noticeable (5 to 8 times)
- Not a silver bullet (the approach has drawbacks too)