

# **Towards Cost-model-based Query Execution** over Hybrid Linked Data Fragments Interfaces

# Amr Azzam, Ruben Taelman, Axel Polleres

### Abstract

A multitude of Linked Data Fragments (LDF) server interfaces have been proposed to expose Knowledge Graphs (KGs) on the Web. Each interface leads to different trade-offs when clients execute queries over them, such as how query execution effort is distributed between server and client. There is *no single silver bullet that works best everywhere*. Each of these interfaces has diverse characteristics that vary the performance based on server load, client resources, and network bandwidth. In this paper, we lay out the high-level ideas to introduce a hybrid LDF framework that can expose multiple interfaces based on a server-side cost model. In addition, we sketch a negotiation protocol through which clients can determine desirable interfaces during query planning using a client-side cost model.

## Linked Data Fragments Spectrum

# Linked Data Fragment Framework(LDF) Proposed to design new mixes of trade-offs.



server cost-model that takes into account the server load and the query shapes. We expose a *collection of interfaces* per query.

This allows clients to select a combination of interfaces based on a *client cost-model* that considers the client capabilities and query plans.

#### FOREACH metric IN metrics

increase = GetValueIncrease(metric, q, interface)

IF GetValue(metric) + increase > GetThreshold(metric) validInterface = false

#### IF validInterface

allowedInterfaces.push(validInterface)

**RETURN** allowedInterfaces

Listing 1: Algorithm for calculating the allowed interfaces for a given query.

### **Implementation Plan**

- The client component will be implemented using the Comunica platform.
- Comunica supports the majority of the LDF interfaces and SPARQL query operators.
- Comunica Architecture follows mediator pattern that will ease the extensibility of multiple cost models

![](_page_0_Figure_22.jpeg)

![](_page_0_Picture_23.jpeg)

Figure 1: Overview of client-server communication for a cost-model-based query execution over a

hybrid of Linked Data Fragments interfaces.

# Contact

Amr Azzam

Vienna University of Economics and Business Vienna, Austria

Email: <u>aazzam@wu.ac.at</u>

#### Ruben Taelman

Ghent University, Ghent, Belgium Email: ruben.taelman@ugent.be Website: www.rubensworks.net

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![](_page_0_Picture_33.jpeg)

# Reference

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