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Turn your web APIs into just another piece of your Knowledge Graph

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Abstract. Web APIs have become a de-facto standard to enable HTTP-based access to machine-processable data. In this talk, I will present the SPARQL micro-service architecture, a lightweight approach that bridges web APIs and RDF knowledge graphs by making it possible to enforce a uniform data model over multiple sources, while using SPARQL as a unique query language. I will illustrate how we apply these techniques in the biodiversity area where multiple data sources provide complementary yet often conflicting data, and how we can integrate in-house and public data sources in a seamless knowledge graph supporting our applications and enriching the users' experience.

Keywords: Web API · Knowledge Graph · Data Integration

Ever increasing amounts of data are being published on the web using a broad spectrum of techniques ranging from web pages and raw files to data lakes, data registries or aggregators. In particular, web APIs have become a de-facto standard to enable HTTP-based access to machine-processable data. Despite this success, however, web APIs often fail in making data interoperable, insofar as they commonly rely on proprietary data models and vocabularies that lack formal semantics which is however essential to ensure reliable data integration. Leveraging knowledge engineering and semantic web approaches can help in building bridges between these disconnected sources, and eventually achieve their integration to develop more clever applications.

In this talk, I will touch upon several approaches that can be used to query RDF knowledge graphs, typically built using mapping-based lifting of legacy data, together with other data sources accessible through web APIs. I will present the SPARQL micro-service architecture, a lightweight approach to wrap a web API into a SPARQL endpoint that produces an RDF graph at run-time by invoking the API. A SPARQL micro-service can assign dereferenceable URIs to web API resources that were previously locked in silos, and turn them into standard linked data resources.

This architecture bridges web APIs and knowledge graphs by making it possible to enforce a uniform data model over multiple data sources, while using SPARQL as a unique query language. Besides, SPARQL micro-services come with rich metadata that allow humans and machines alike to discover them at web scale, and decide whether they can help in carrying out a certain task.

I will illustrate how we apply these techniques in the biodiversity area, where multiple data sources cover complementary and often overlapping regions, epochs or domains, but may also report or rely on conflicting data and perspectives. I will also demonstrate how this approach allowed us to integrate in-house and public data sources in a seamless knowledge graph supporting our applications and enriching the users' experience.