

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

Franck Michel, Fabien Gandon

► To cite this version:

Franck Michel, Fabien Gandon. Turn your web APIs into just another piece of your Knowledge Graph. KGC 2023 - The Knowledge Graph Conference, May 2023, New York (NY), United States. hal-04351695

HAL Id: hal-04351695 https://hal.science/hal-04351695

Submitted on 18 Dec 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers. L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

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

Franck Michel⁰⁰⁰⁰⁻⁰⁰⁰¹⁻⁹⁰⁶⁴⁻⁰⁴⁶³ and Fabien Gandon⁰⁰⁰⁰⁻⁰⁰⁰³⁻⁰⁵⁴³⁻¹²³²

University Côte d'Azur, CNRS, Inria, I3S (UMR 7271), France franck.michel@inria.fr, fabien.gandon@inria.fr

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.