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Information technology — Database languages — GQL

Technologies de l'information — Langages de base de données — GQL

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Foreword

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Any feedback or questions on this document should be directed to the user's national standards body. <https://www.iso.org/members.html> and <https://www.iec.ch/national-committees>.

Introduction

This document defines GQL, a database language for modeling structured data as a graph, and for storing, querying, and modifying that data in a graph database or other graph store. There are two major graph data models in current use: the Resource Description Framework (RDF) model and the Property Graph model. The RDF model has been standardized by W3C in a number of specifications. GQL addresses the Property Graph model.

Property graphs organize data as entities called nodes (or, alternatively, vertices) and edges (or, alternatively, relationships). Each graph element (a node or an edge) can have associated labels and properties. The flexibility and intuitiveness of the data model and its emphasis on interconnections between graph elements make property graphs suitable for storing complex knowledge and for analytical tasks such as entity resolution, fraud detection, cyber security, and forecasting.

GQL is declarative and transactional, taking inspiration from SQL and from leading independently-developed property graph languages. Property graphs select data primarily through path pattern matching. Defining path pattern searches in a graph is often simpler or more flexible than defining the equivalent joins in SQL. The flexible data model, the availability of path pattern matching, and the efficiency of traversing edges compared to joining tables have led to increasing interest in property graph databases.

Various graph data models have been around for many decades, but it is only since the early 21st century that the demand has driven the rise of commercial graph database and graph analytical systems for property graphs.

GQL provides a standard yet flexible common language for this growing market. GQL supports the same graph pattern matching syntax as SQL Property Graph Queries, ISO/IEC 9075-16, Information technology — Database languages SQL— Part 16: Property Graph Queries (SQL/PGQ). While SQL/PGQ provides the property graph data model and graph pattern matching on top of a relational SQL database, GQL is intended for pure property graphs that provide graph data management independent from SQL.