

# Graph Technology at Oracle

Oracle Graph is a complete graph database for the enterprise. A feature of Oracle Database, it provides a rich set of Property Graph and RDF Graph features, delivering extreme performance and scalability for graph query and analytics in enterprise applications. The Graph Studio feature of Oracle Autonomous Database, a fully automated database service, automates and simplifies development and deployment of graph applications, with capabilities such as automated graph modeling and feature rich notebooks with integrated visualization. These state-of-the-art graph features are available with functionality required for enterprise grade applications: fine-grained security, high availability, easy manageability, and integration with other data in an application. Oracle's converged engine supports diverse data types including graphs, spatial, JSON, text, and XML. Oracle aligns with applicable ISO and Worldwide Web Consortium standards for representing and defining graphs and graph query languages.

## Graph Database and Analytics

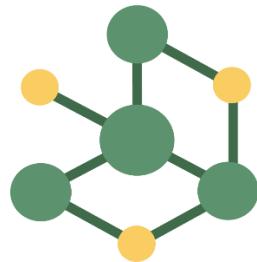
Oracle's mission is to help people see data in new ways, discover insights, and unlock endless possibilities. Graph analysis is about understanding relationships and connections in data, and detecting patterns for new insights. With Oracle Graph developers can use a comprehensive suite of graph query and analytics tools, and build applications on enterprise grade data management infrastructure. Innovative technologies such as Oracle Autonomous Database, the industry's only self-driving, self-securing, and self-repairing database, are available to graph applications.

## Graph Studio in Autonomous Database

Graph Studio makes it easy to create graph models from data in your database or data warehouse, perform graph analysis, develop graph applications, and visualize and share results. The point-and-click, low-code user interface automates graph data management and graph modeling, and simplifies graph queries, analysis, visualization, and deployment. Using Graph Studio developers and data scientists can get started with graphs in minutes.

## Property Graph Features

Property Graph features include an in-memory Graph Server (PGX) for scalable, high speed graph analytics, Python and Java APIs for over sixty pre-built graph analytics algorithms, a powerful, an easy-to-use SQL-like graph query language PGQL, and comprehensive APIs for developing applications. The pre-built analytics APIs include algorithms for clustering, ranking, path-finding, evaluating structures and graph machine learning.



**Advanced Graph Data Management for the Enterprise**

"Identifying suspicious activity is mission critical for our business. Oracle Graph feature in Oracle Database provides outstanding performance benefits for this. Queries that used to take minutes, hours, or even days now run in sub-seconds with Oracle's graph features. The improvement in delivering anti-fraud alerts on time is in orders of magnitude. This brings a lot of real business value."

**Yavor I Ivanov**  
Head of Database Administration  
Paysafe Group

## Key Benefits

- Oracle Database scalability, security, and manageability for enterprise graph applications
- Extreme performance for critical enterprise graph datasets
- Graph Studio in Autonomous Database for automation and simplicity
- Commercial strength scalability, and comprehensive support for property graph query and analytics
- W3C RDF semantic graphs with advanced support for Linked Data and Knowledge Graph applications

## Related Products

- Oracle Cloud
- Oracle Autonomous Database
- Oracle Advanced Analytics
- Oracle Exadata

## Key Property Graph Features

- 60+ powerful parallel, in-memory graph analytics

## RDF Graph Features

RDF graph model in Oracle Database provides native support for the W3C standards RDF, OWL, and query language SPARQL. The GeoSPARQL (Open Geospatial Consortium standard) implementation evaluates spatial data in an RDF graph, and RDF views defined on tables using the R2RML mapping enable SPARQL queries on relational data. The RDF graph feature can be used with popular frameworks such as Apache Jena APIs and Eclipse RDF4J, and tools such as Protégé. A native RDF server makes it easy to create SPARQL endpoints.

## Enabling Graphs for the Enterprise

As part of Oracle's converged database offering, Oracle Graph eliminates the need to set up a separate database and move data into a silo-ed system. The graph capabilities are integrated with the database. Analysts and developers can perform fraud detection in banking, find connections and links to data, and improve traceability in smart manufacturing, all while gaining from Oracle Database features such as enterprise-grade security, high availability, manageability, concurrency, ACID properties, ease of data ingestion, and strong support for multiple types of workloads. Customers in financial services, manufacturing, retail, life sciences, healthcare, and national and local governments rely on Oracle Graph technologies.

*“Given our focus on customer-oriented innovation, our Oracle solutions enable us to focus on providing our customers with added value knowing our cutting-edge technology gives us a competitive edge.”* Luis Esteban, Chief Data Officer, CaixaBank.

- Java and Python API to execute analytics in parallel in the in-memory Graph Server for analytics
- Optimized storage model
- PGQL, powerful SQL-like language to run graph queries
- Ease of development with rich UI – interpreters for notebook, shell UI, and graph visualization
- Property graph analysis of RDF graphs using property graph views

### Key RDF Graph Features

- Support for W3C and OGC standards: RDF, SPARQL, R2RML, OWL, SKOS
- RDF Triple store in compressed, partitioned tables
- Parallel load, query and inference
- RDF views on property graph data and property graph views on RDF data
- Ontology-assisted relational querying
- Oracle Database In-Memory support
- Full integration with SQL Developer

### Resources

For more information, visit <https://www.oracle.com/database/graph/>

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