Neo4j Tool Talk

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Graph Database

- Graph Databases employ a Graph Model to store data.
- Nodes in the graph represent entities, such as people or products.
- Relationships between nodes illustrate connections between entities.
- Properties store additional information about both nodes and relationships.
- The Cypher Query Language is utilized for performing sophisticated graph queries.
- Graph Databases are particularly well-suited for managing data with complex, many-to-many relationships.
- Common applications include social networks, recommendation systems, and fraud detection, among others.

Why Graph Database

- Emphasizing the significance of relationships over data, Neo4j highlights the importance of storing connections between data points.
- Unlike relational databases, which primarily focus on storing highly structured data, Neo4j prioritizes the storage of relationships alongside the data itself.
- In Neo4j, relationships and connections are treated as primary entities, allowing for a more nuanced and comprehensive representation of data.
- This approach aligns with the philosophy that understanding the relationships between data points often yields more valuable insights than the data alone.
- Neo4j's architecture and design cater specifically to efficiently managing and querying data with complex relationship structures.
- By recognizing the primacy of relationships in data representation, Neo4j addresses the limitations of traditional relational databases.

RDBMS vs Graph Database

RDBMS	Graph Database
Tables	Graphs
Rows	Nodes
Columns and data	Properties and its values
Constraints	Relationships
Joins	Traversal

Introduction to Neo4j

- Neo4j stands as the premier open-source Graph Database globally.
- Data storage and querying in Neo4j revolve around nodes, relationships, and properties.
- Neo4j boasts exceptional scalability and operates on a schema-free (optional) NoSQL framework.
- The platform ensures transactional integrity and maintains high operational availability.

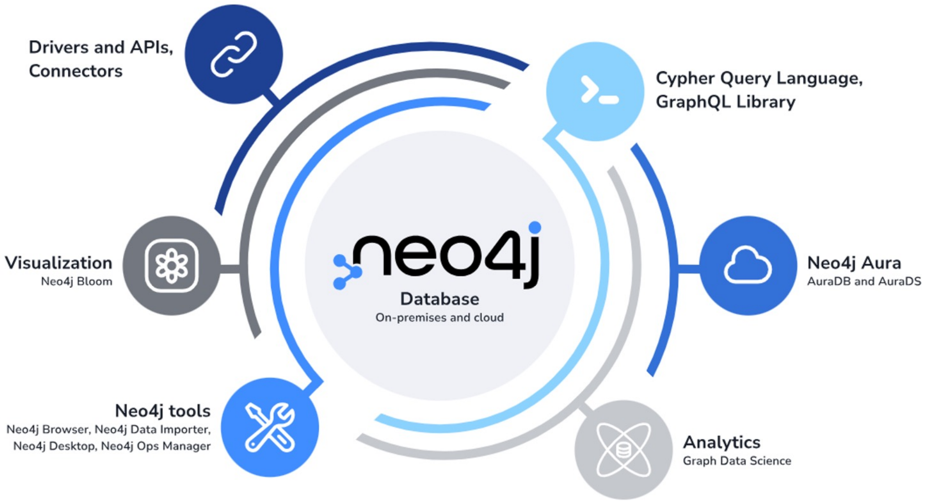

Drivers and APIs, Connectors
Cypher Query Language, GraphQL Library
Visualization
Neo4j Bloom
neo4j
Database
On-premises and cloud
Neo4j Aura
AuraDB and AuraDS
Neo4j tools
Neo4j Browser, Neo4j Data Importer, Neo4j Desktop, Neo4j Ops Manager
Analytics
Graph Data Science

Figure 1. Overview of the Neo4j ecosystem

Neo4j Usage

- Graph based recommendations
- Fraud detection
- Iot applications
- Customer engagement
- Data Lake migration
- Knowledge graphs for AI
- Identify and access management

Neo4j Query Language

- Has **C**ypher **Q**uery **L**anguage(**CQL**)
- It is a declarative pattern matching language.

Clauses in Cypher

- WHERE Clause
- ORDER BY Clause
- RETURN Clause

Functions in Cypher

- String Functions
- Aggregation Functions

Features and Advantages

Features

- ACID Properties
- Scalability and Reliability
- Supports Indexing
- Can work with REST API using Java, Spring and Scala. Also works with JavaScript (NodeJS).
- Built in Neo4j Browser. Using this to create and query the data.
- Flexible Data Model
- No Joins

Neo4j Drivers

Neo4j provides below official drivers that enable applications to interact with Neo4j databases.

- Neo4j Java Driver
- Neo4j Javascript Driver
- Neo4j .Net Driver
- Neo4j Python Driver
- Neo4j Go Driver

Neo4j Deployment Center - Graph Database & Analytics

Environment Setup (Show online)

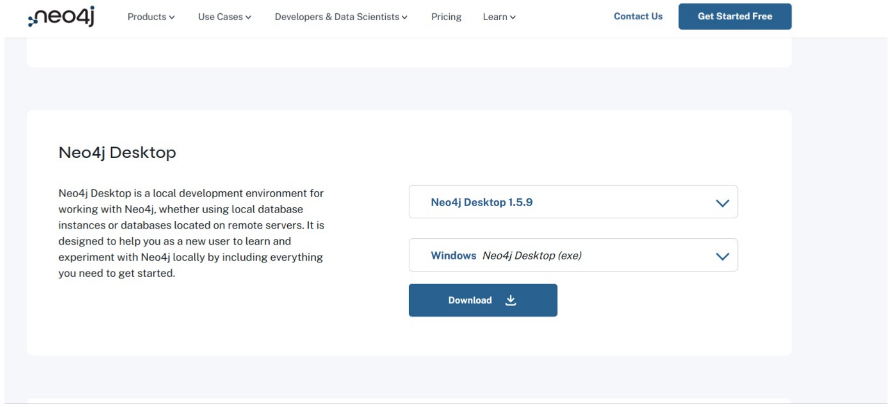
Software requirements

- Operating System - Debian 11, MacOS 11, SuSE Enterprise Desktop 15, Ubuntu Desktop 22.04+, Windows 10 or above
- Memory - 2GB minimum, 16GB or more recommended.
- Requires Java to be pre-installed

System requirements - Operations Manual (neo4j.com)

Installation

- Visit the Neo4j Download Page - Neo4j Deployment Center - Graph Database & Analytics
- Choose Neo4j Desktop and version
- Run the installer



Neo4j Desktop

Neo4j Desktop is a local development environment for working with Neo4j, whether using local database instances or databases located on remote servers. It is designed to help you as a new user to learn and experiment with Neo4j locally by including everything you need to get started.

Neo4j Desktop 1.5.9

Windows *Neo4j Desktop (exe)*