

NoSQL Database.

What is NoSQL?

→ A NoSQL database provides a mechanism for storage and retrieval of data that is modeled in means other than the tabular relation used in relational databases.

The Four Basic NoSQL database types are:

- Key-Value
- Document-based
- Column-Family
- Graph Database

(Neo4j, ArangoDB, OrientDB, Dgraph, etc..)

Introduction.

What is Neo4j?

- developed in 2010, Feb 23
- Neo4j is Graph Database Technology
- it not just stores the data, but also maintains the Relationship
- in Neo4j Data Traversal is very fast.

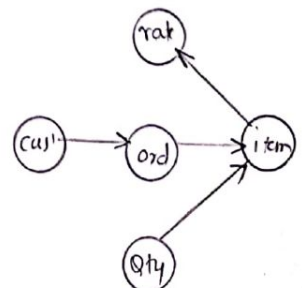
Traditional Database vs Neo4j



In Traditional Database Technology Data stored in the form of Rows & Columns, SQL is Structured Query Language.

In the Graph database, Graph contains node & data stored in node & Relationships are maintained by vertex.

Neo4j Uses → Cypher is Cypher Query Language.



Why Graph Databases ?

we live in connected world | There is not having isolated piece of information.

- ✓ if data is connected Then we are able to store, access and retrieve the data efficiently.
- ✗ in traditional data storage relationships are maintained using ~~JSON~~ JOIN operator, which is expensive

Choose Any Programming Language

Neo4j officially Supports the drivers for the following programming languages .

1. .Net
2. Java
3. JavaScript
4. Go
5. Python

Data Model .

Node .

- Node is a data or record in a graph database .
- In neo4j , The CREATE statement is used to create a Node .

Ramesh

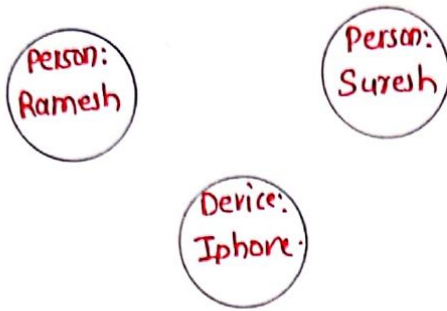
Suresh

Iphone

Using Node we are Not Getting Any clear Idea About the Ramesh, Suresh & Iphone , we need some more data .

Labels:

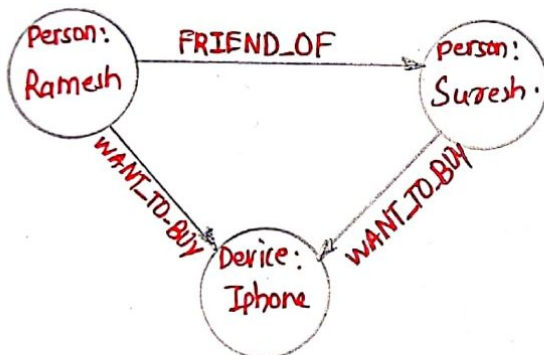
- Labels are Used to categorize the Node
- Labels Are optional
- Labels Gives more information About Node .



Here Ramesh & Suresh are person and Iphone is a Device .

Relationships:

- we are just having Nodes with a data and Label
- Relationships connect Two nodes
- Relationship has Source Node And Target Node.
- Relationship shown using Directional Arrow.

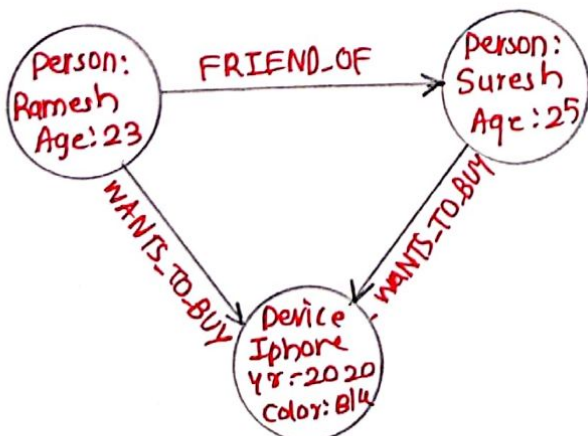


Here Ramesh And Suresh are person, and Iphone is a Device . Relationships are .

- Ramesh is a FRIEND_OF Suresh .
- Ramesh WANTS-TO-BUY Iphone
- Suresh WANTS-TO-BUY Iphone .

Properties:

- properties are Name-value pairs of data
- properties Give more information About data/Node .



properties Are :

- Ramesh's Age : 23
- Suresh's Age is : 25
- Iphone year is 2020
- Color of Iphone : Black .

Objectives

1. High performance.

Neo4j delivers the lightning-fast read and write



2. Active Graph Community

Neo4j has the largest graph database community



3. Free to Learn.

Neo4j provides 2 Free Courses to Learn The Graph Database Technology

FREE

Compatible Platforms

For Programming Language Compatibility Neo4j provides Official Driver For :Net, Java, Python, JS & Go

System Requirements

1. Supported platforms : 64x System Architecture.

2. Hardware Requirement CPU minimum intel i3

Memory 2GB Minimum

Storage 10GB SSD/NVME

3. Java .

It is Required to Have compatible JVM to Run Neo4j Instance .

Application Areas.

Below are some of the sectors where Neo4j is used.

- Fraud Detection & Analysis
- Recommendation Engine & Product Recommendation System
- Social Media and Social Network Graph
- Supply chain Management.

Top Companies Using Neo4j

1. ebay
2. Adobe
3. cisco
4. airbnb
5. IBM.

Future Enhancement.

Below are some of the future enhancements for Neo4j

- performance is good for small dataset.
- Same server configuration required for both small & large dataset
- Neo4j doesn't use other open source APIs like Blueprint. You have to use the native Neo4j API.
- For data visualization we have to use third-party packages. Neo4j should have its default packages.
- For premium customers Neo4j does not provide any extra consulting services.

Security Constraints.

Neo4j Has Complex Security Model Stored in the System Graph, Maintained By Special Database Called as System Database.

To Execute Any Command, User Must have Rights to Execute

Privileges for each Build-in role Mentioned Below :

- The **PUBLIC** role
- The **READER** role
- The **EDITOR** role
- The **PUBLISHER** role
- The **ARCHITECT** role
- The **ADMIN** role

Advantages



1. Highly Scalable

It provides a simple, powerful and flexible data model which can be changed according to Applications and Users.



2. Schemas

in neo4j while Creating Data we not need to worry about schema.



3. Easy Representation-

Neo4j provides Very Easy way to provide Connected data.



4. Fast Execution

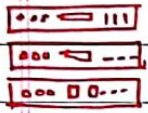
Neo4j is Fast Because More Connected Data is very easy to Retrieve and Navigate.



5. No Joins

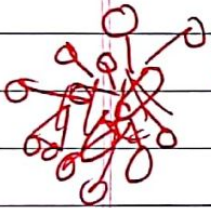
in Neo4j while Creating Data we not need to worry About Schema.

Disadvantages



1. Lack of Optimization

Through the performance is good. But for small Dataset it Requires a well configured server.



2. Gets more Complex.

Graphical Representation for small Dataset is good and if there is complex dataset in which more than 10 Relation possible then graphs are not good.