



Amazon Neptune

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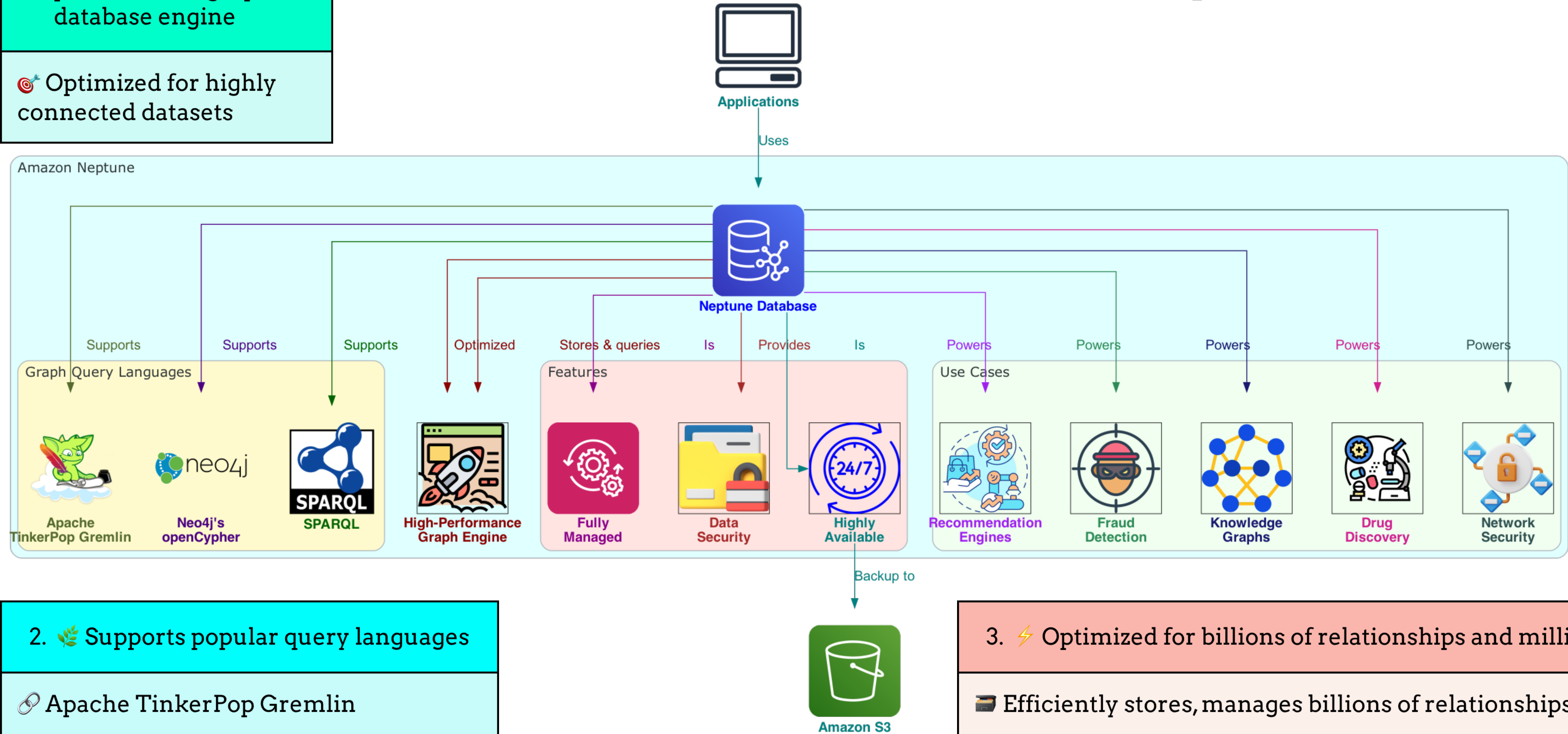
4. What is a Graph Database?






5. Why Choose a Graph Database?





-  Purpose-built, high-1. performance graph database engine
-  Optimized for highly connected datasets



What is Amazon Neptune?

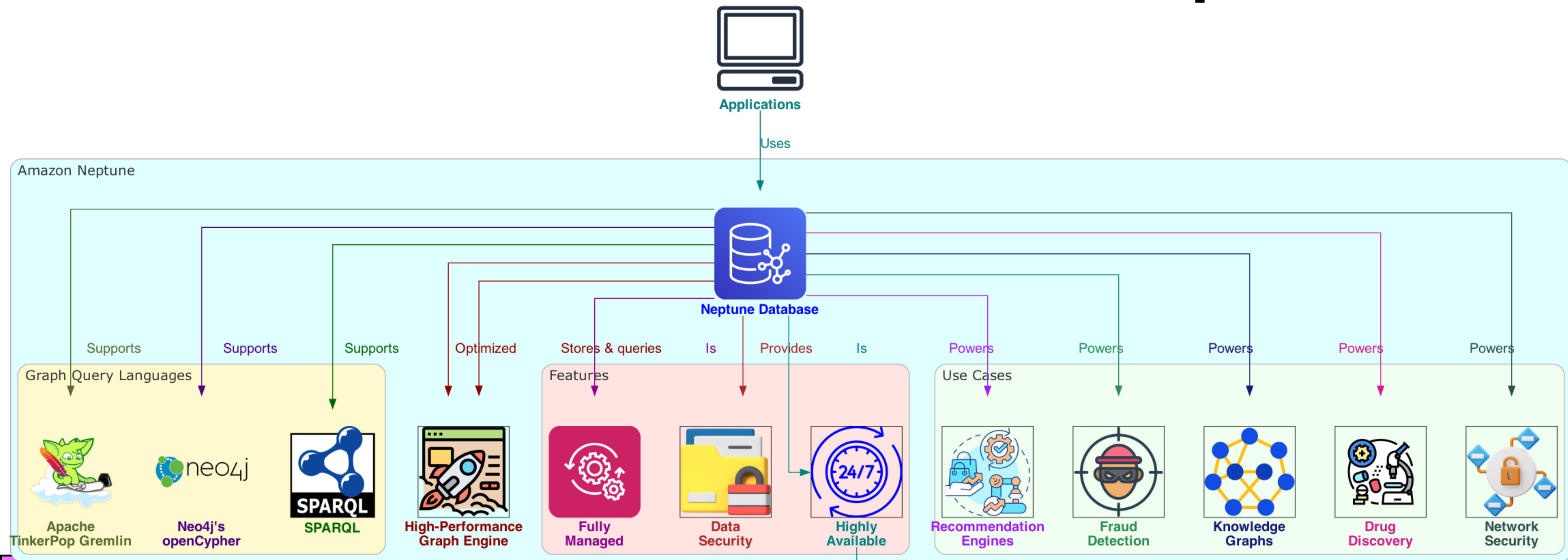


2.  Supports popular query languages
-  Apache TinkerPop Gremlin
-  Neo4j's openCypher
-  W3C's RDF query language, SPARQL
-  Easy to adopt and use

3.  Optimized for billions of relationships and millisecond latency
-  Efficiently stores, manages billions of relationships
-  Query results with millisecond latency
-  High performance for graph-based applications



What is Amazon Neptune?



4. 🧩 Powers various use cases

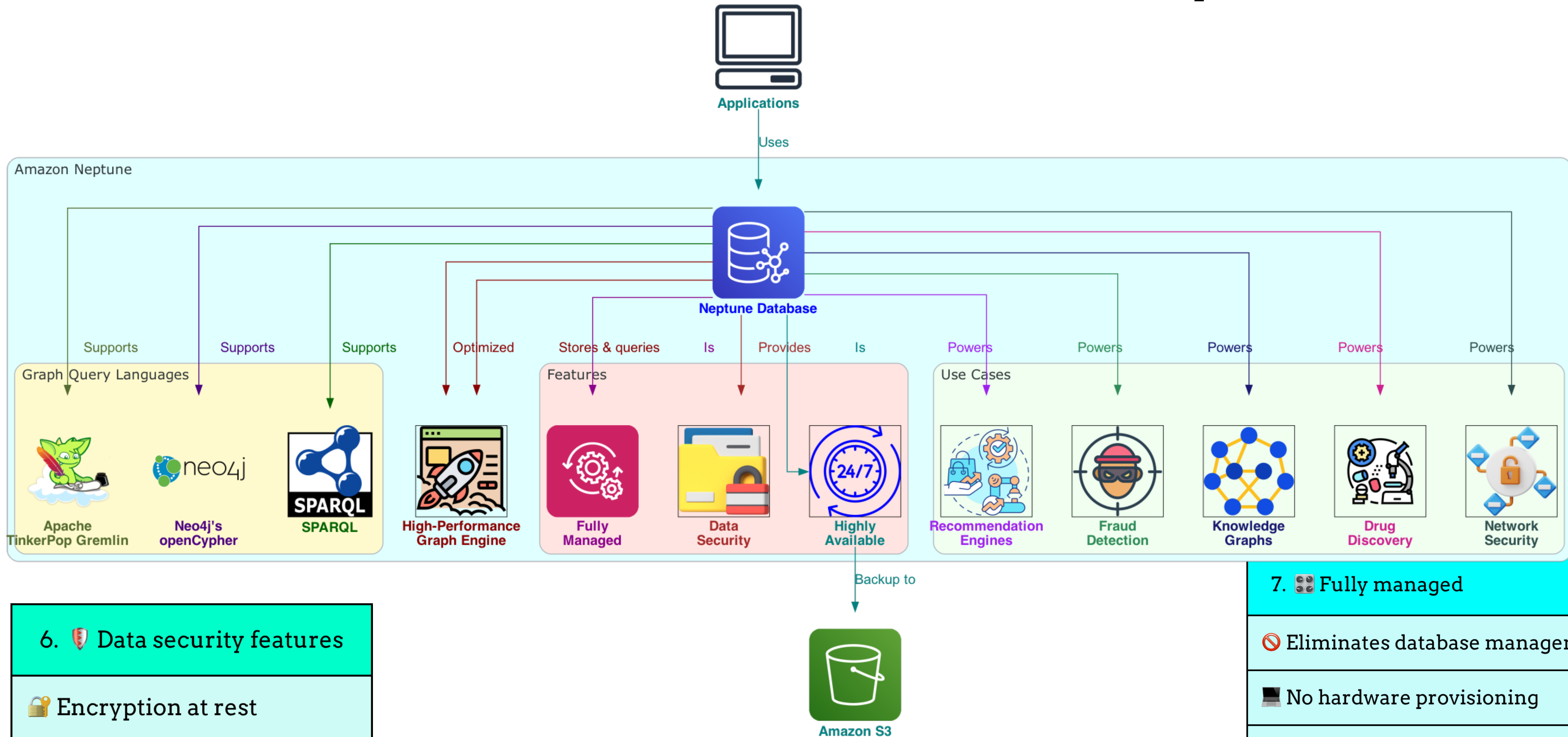
- 👍 Recommendation engines
- 🕵️ Fraud detection systems
- 📖 Knowledge graphs
- 💊 Drug discovery platforms
- 🔒 Network security applications

5. 🗄️ Highly available

- 📖 Read replicas
- 🕒 Point-in-time recovery
- 📦 Continuous backup to Amazon S3
- 🌐 Replication across Availability Zones
- ⬇️ Minimizes downtime and data loss risks



What is Amazon Neptune?



6. 🛡️ Data security features

🔒 Encryption at rest

🔒 Encryption in transit

🔍 Protects sensitive information

7. 🧑‍💻 Fully managed

🚫 Eliminates database management tasks

🖥️ No hardware provisioning

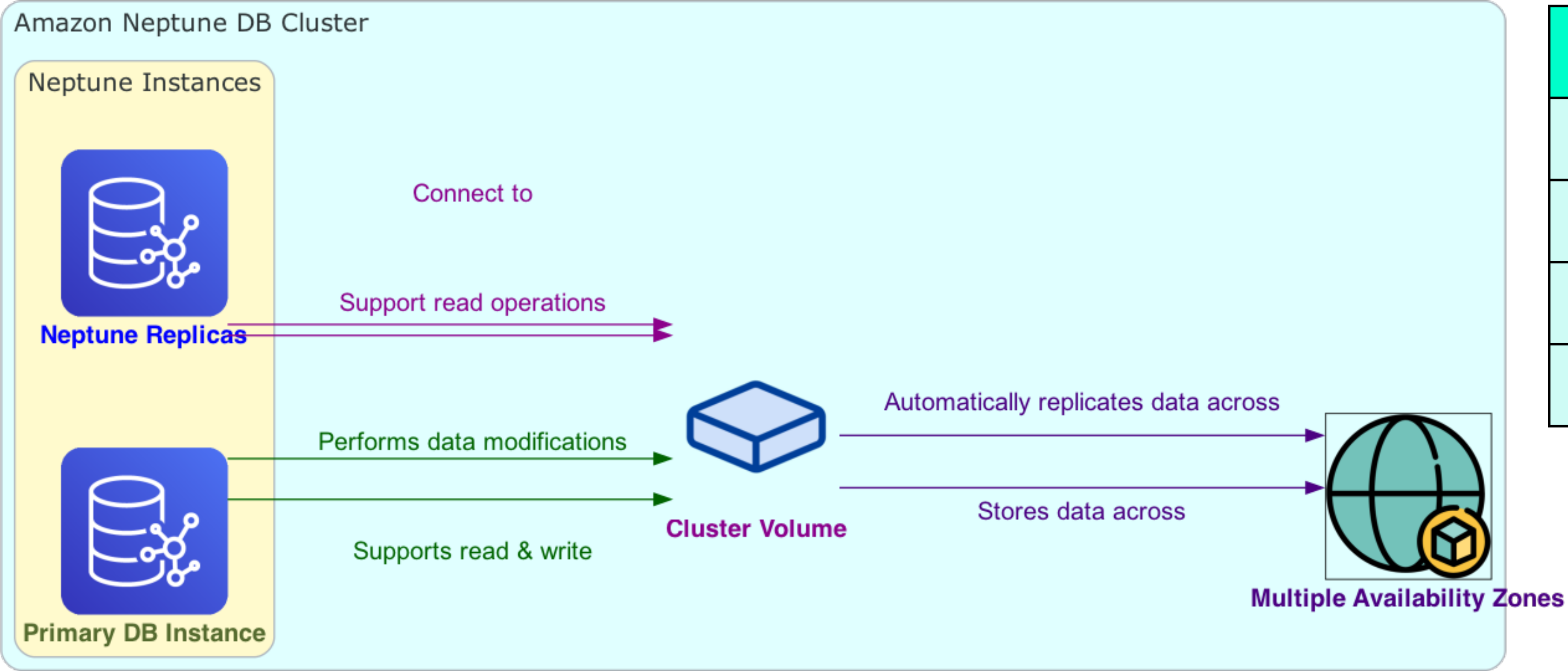
🔧 No software patching

⚙️ No setup or configuration

💾 No backups

👨‍💻 Allows developers to focus on building applications

Key Service Components



1. 🌟 Primary DB Instance

📖 Supports read & write operations

👉 Performs data modifications to cluster volume

1 One per Neptune DB cluster

🔪 Responsible for writing graph database contents

2. 🔄 Neptune Replica

🔗 Connects to same storage volume as primary

📖 Supports only read operations

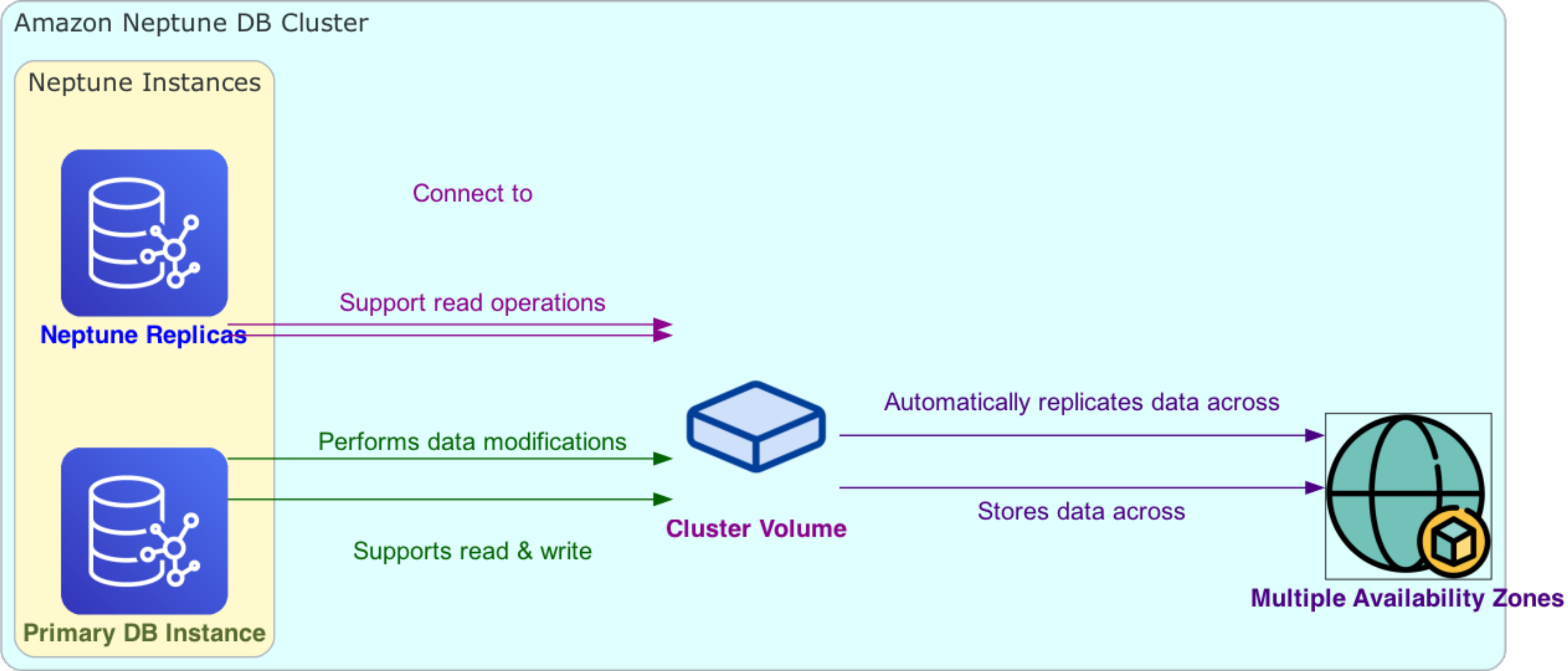
1 5 Up to 15 per Neptune DB cluster

🚀 Provides high availability

🌐 Located in separate Availability Zones

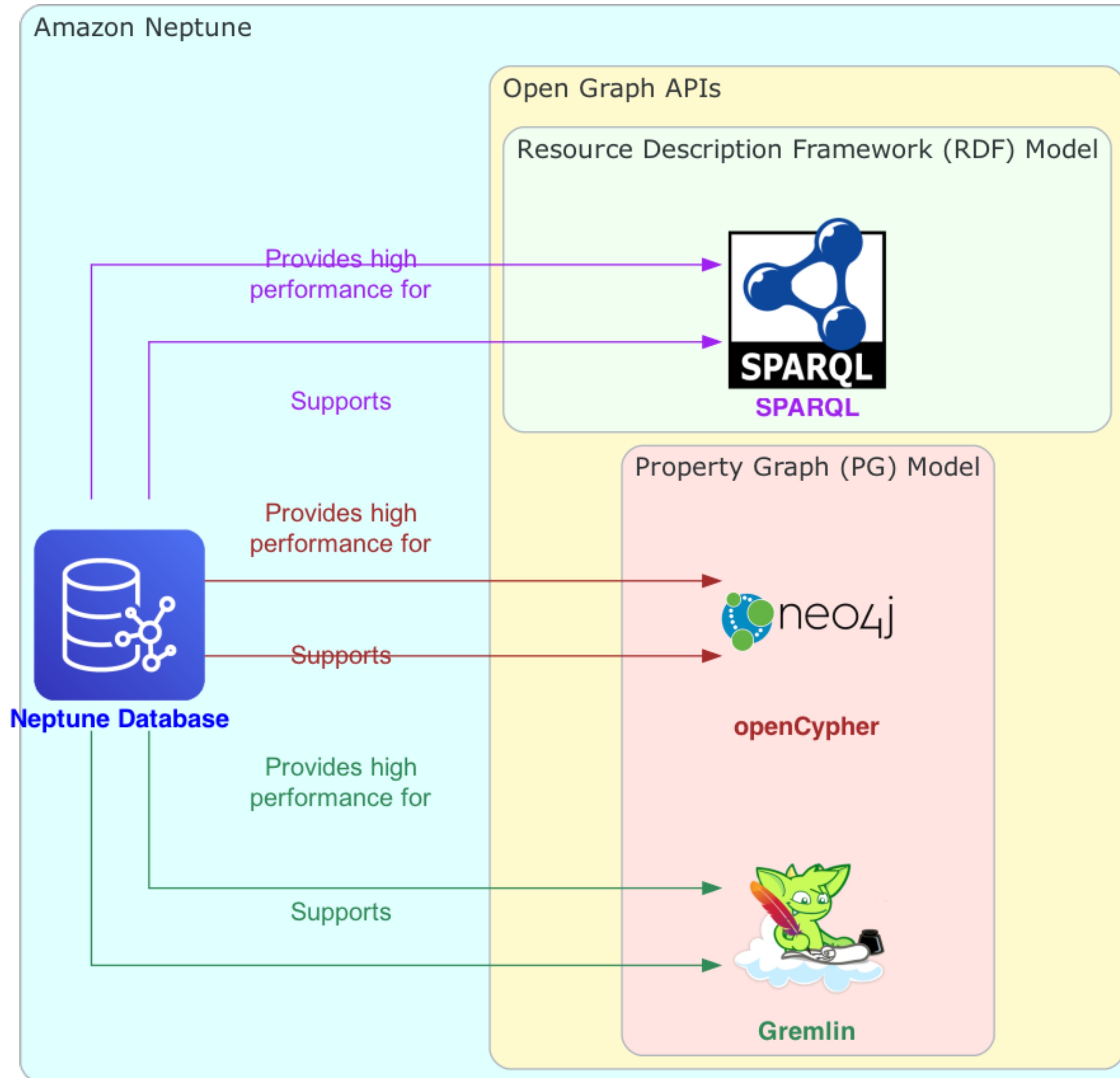
⚖️ Distributes load from reading clients

Key Service Components



3. 📦 Cluster Volume
💾 Stores Neptune data
🎯 Designed for reliability & high availability
📋 Consists of data copies across multiple AZs
🔄 Data automatically replicated across AZs
💪 Highly durable
🔒 Little possibility of data loss

Open Graph APIs Support



What is a Graph Database?

Vertices=Nodes

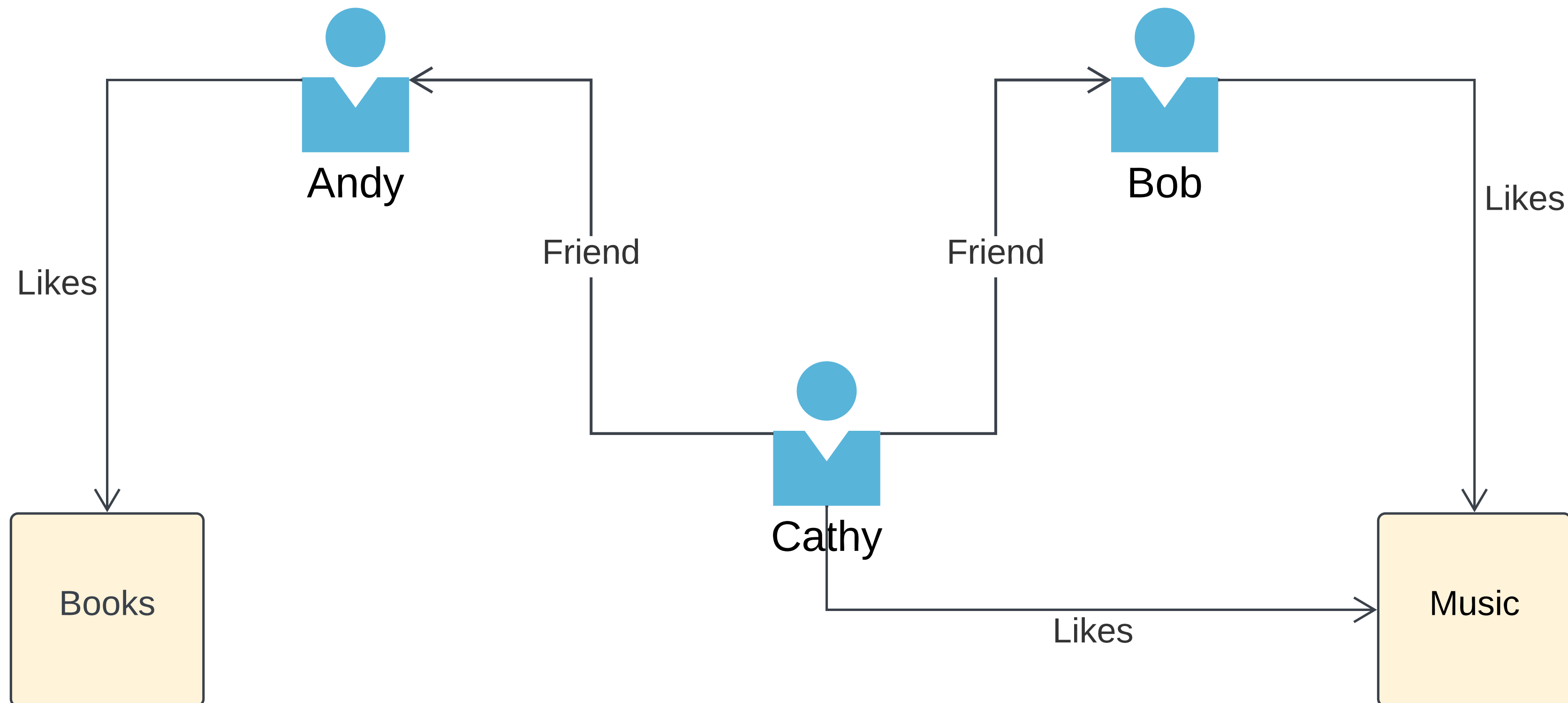
e.g. People and Hobbies

Andy, Bob, Cathy, Books and Music

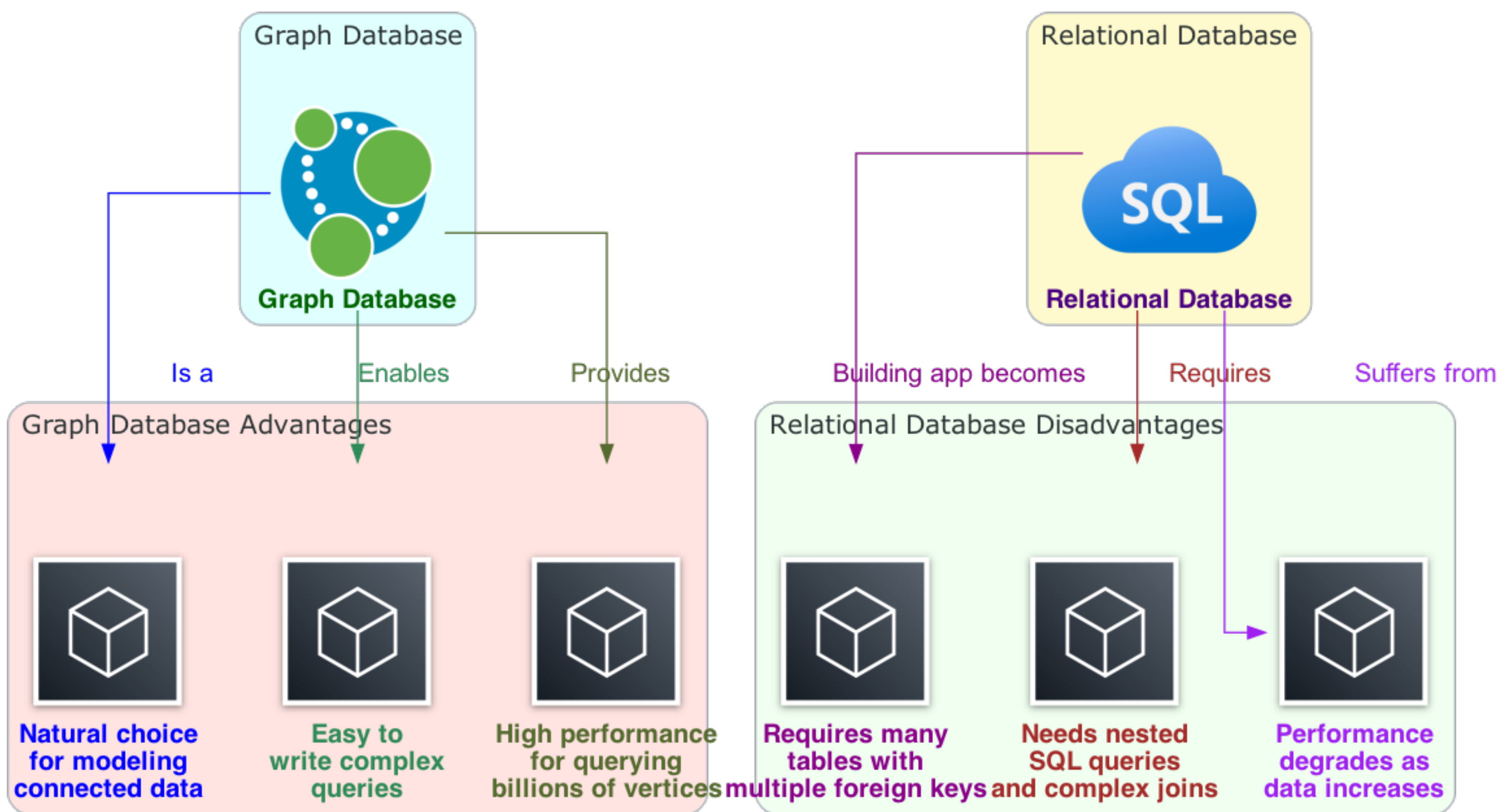
Edges=Predicates=Relationships

e.g. Friend and Likes

In Property graphs, both vertices and edges can have additional *properties* associated with them.



🤔 Why Choose a Graph Database?



1. 🌐 Ideal for modeling connected data

🎯 Natural choice for relationship-centric data

3. 🚀 Outperforms relational databases

🐌 Relational DB performance degrades with data growth

🏆 Graph DBs maintain high performance

2. 📝 Easy to create complex queries

🔗 Model data interconnections as a graph

🔍 Extract real-world information

4. 🏗️ Simpler application development

🕸️ Relational DBs become unwieldy

📐 Graph DBs offer straightforward approach

5. 💪 Handles billions of vertices efficiently

🌐 Querying relationships at scale

⚡ Ensures high performance



Where to use Graph Databases?

1. 🧠 Knowledge graphs

🔍 Organize and query connected information

? Answer general questions

2. 🆔 Identity graphs

🔗 Store relationships between information categories

📁 Customer interests, friends, purchase history

📊 Query data for personalized recommendations

3. 🕵️ Fraud graphs

💳 Track credit card purchases and locations

🚨 Detect uncharacteristic use or known fraud patterns

4. 🌐 Social networking

👥 One of the first and most common use cases

5. 🗺️ Driving directions

🚗 Find the best route from start to destination

🚦 Consider current and typical traffic patterns

6. 🚚 Logistics

📦 Identify efficient ways to use shipping resources

🎯 Meet customer requirements

7. 🩺 Diagnostics

🌳 Represent complex diagnostic trees

🔍 Query to identify sources of problems and failures

8. 🔬 Scientific research

📊 Store and navigate scientific data

9. 📖 Regulatory rules

🔍 Store complex regulatory requirements as graphs

🔍 Query to detect applicable situations in business operations

10. 🌐 Network topology and events

🗺️ Store network topology as a graph

🔄 Store and process different kinds of network events

🔒 Manage and protect an IT network



**Thanks
for
Watching**