

ArangoDB

**Non-Relational Databases
Group 8**

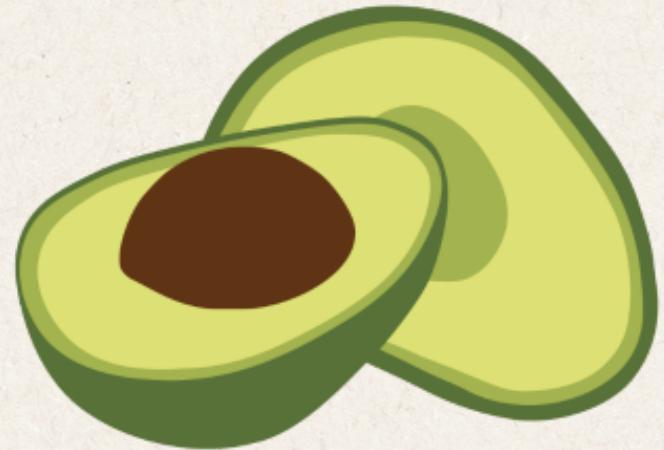
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Technology overview



ArangoDB

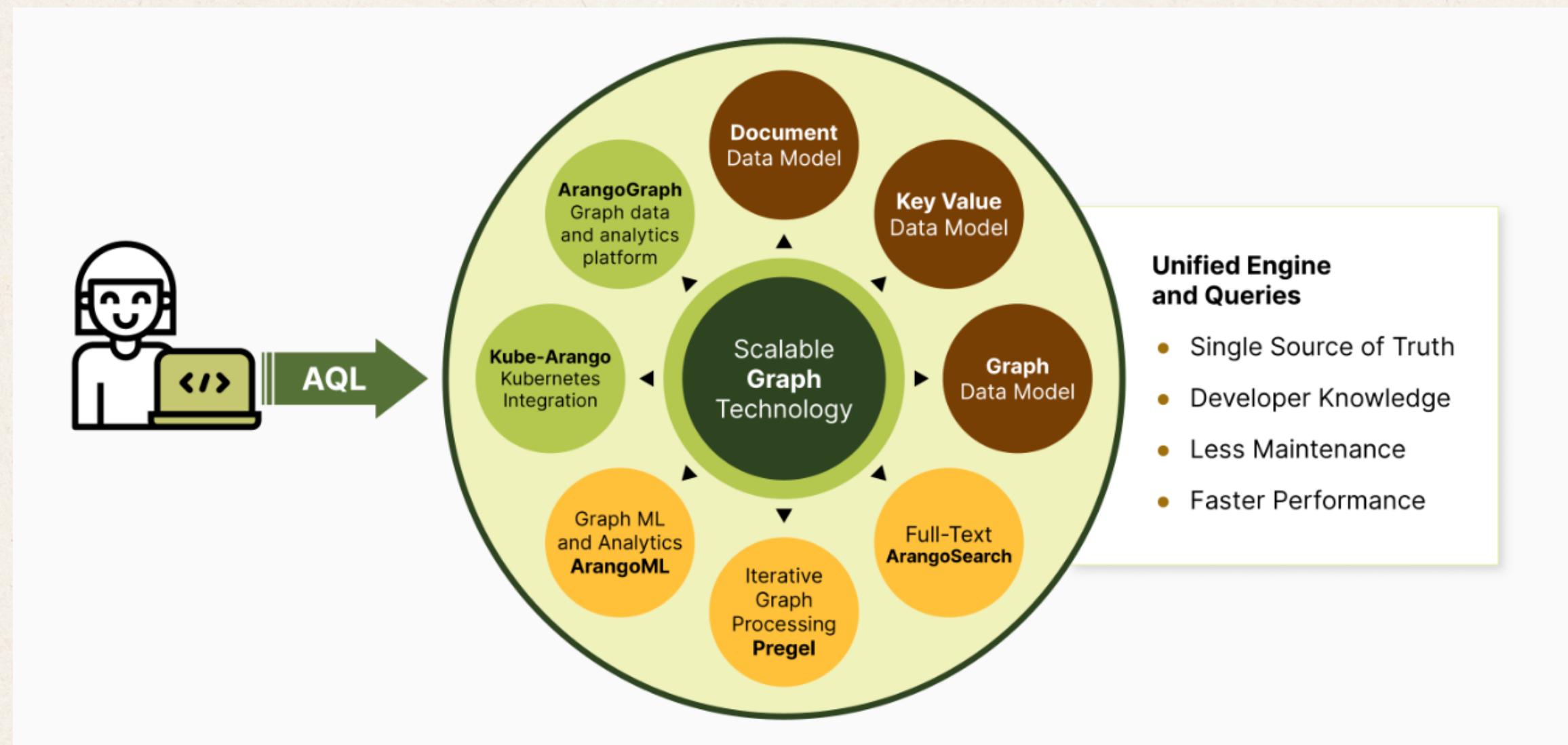
- First released in 2011
- A complete and scalable graph database for real-world use cases
- Combines graphs, documents and key-value, search engines and machine learning all in one
- Written in C++
- Active community on platforms like GitHub, Stack Overflow, Slack, and Google Groups
- Extensive documentation organized for easy navigation, covering various topics from getting started to specific query languages (AQL) and deployment

Data Models

- **Document Data Model:**
 - Every document is a JSON object and it has a **key** attribute serves as a unique identifier within a collection
 - There is an additional attribute **id** that identifies a document within a database
 - Efficient storage and retrieval using keys and indexes
- **Graph Model:**
 - Vertices and edges represented as documents
 - Special attributes for edges referencing the source and target vertices
 - Supports direct operations on graph documents and efficient graph algorithms (traversal, shortest path, etc)
- **Key-Value Model:**
 - Each record is stored as a block of data under a key that identifies it
 - The data is opaque, the system doesn't know anything about the contained information
 - Is a subset of ArangoDB's document data model
 - This paradigm is used at the heart of ArangoDB and enables effective scalability

Main Features

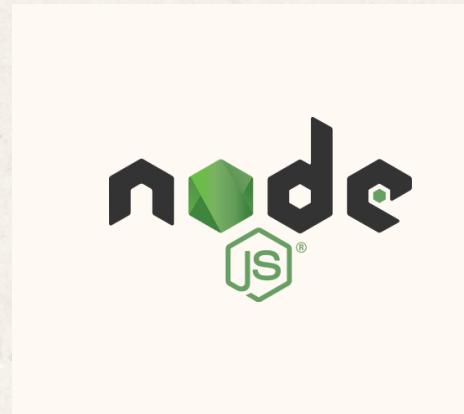
- ACID Transactions:
 - Supported for document and graph data structures
- AQL (ArangoDB Query Language):
 - From simple CRUD operations, over complex filters and aggregations, all the way to joins, graphs, and ranked full-text search
 - Attribute-level manipulation and querying capabilities
- High scalability and availability:
 - Can be deployed across multiple servers
 - ArangoDB can divide collections into multiple shards to distribute the data across multiple cluster nodes
 - Replicate data to multiple cluster nodes, with automatic failover
- Full-text Search Engine (ArangoSearch):
 - Integrated into AQL and with support for all data models
 - supports various kinds of search patterns (tokens, phrases, wildcard, fuzzy, geo-spatial, etc.)
 - Rank results by relevance and similarity
 - Has natural language processing (NLP) capabilities
- Machine Learning:
 - Based on graphs at enterprise scale
 - Can use it as a metadata store for model training parameters or run analytical algorithms in the database, etc



Application Programming Interfaces and Client Libraries

Client Libraries

Available for popular programming languages:



Facilitates integration with ArangoDB in various development environments

RESTful API:

- Option to bypass client libraries and interact directly with the API
- Sends HTTP requests to the server
- Supports CRUD operations (GET, POST, PATCH, PUT, DELETE)

Administration overview

The ArangoDB server (arangod) comes with a built-in web interface for administration. It lets you manage databases, collections, documents, users, graphs and more.

