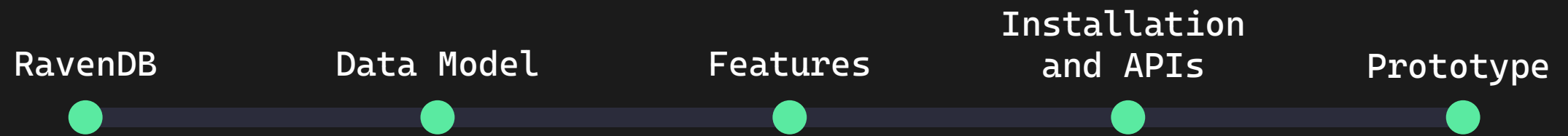


RavenDB



OVERVIEW

Overview

Data Model

Features

Installation
and APIs

Prototype



OVERVIEW

- Open-source distributed document database.
- Started in 2008 with 1.0 launching in 2010.
- Built to tackle traditional relational databases issues.
- Has 3 free licenses (including one for cloud) and 2 paid licenses.
- First NoSQL database to provide ACID transactions over documents and clusters.

DATA MODEL

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DATA MODEL

- Stores documents as JSON files.
- Supports graph-like functionalities.
- Distributed counters.
- Time series.
- Attachments (large binary files).



OPERATIONS

- CRUD operations are available over a session/transaction.

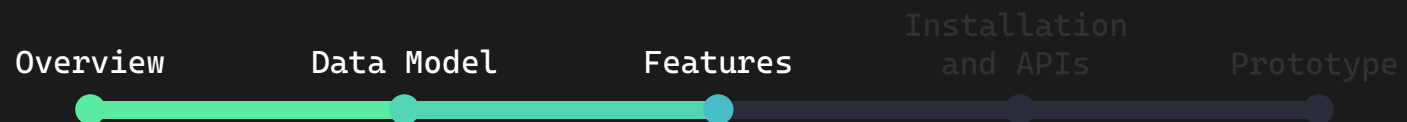
NOTE

Update operations require JavaScript to match documents explain how to update them.

- Built with Lucene to enable full-text search with boosting ability.



FEATURES



CONSISTENCY

Atomicity
Consistency
Isolation
Durable

Basically
Available
Soft-state
Eventually consistent

- **ACID** properties are provided with transactions, and **BASE** properties are mostly inherited from RavenDB's NoSQL paradigm.
- In a group of nodes with the same database in a cluster, has its consistency achieved with master-to-master replication.

DISTRIBUTION

- An instance or more of RavenDB databases forms a cluster.
- Within nodes of a cluster with the same database, the cluster decides which node is performing the task.
- A cluster is limited in CPU cores used. That limit is established by the acquired license.

NOTE

Cluster with 3 nodes && $\max(\text{core}) = 3 \Rightarrow 1 \text{ core/node}$



REPLICATION

INTERNAL

EXTERNAL

HUB/SINK

Between

All database
group nodes

Two DBs typically
on two clusters

Sinks connecting to a
single hub on different
clusters

Handled by

Nodes

Task defined by
the user

Task defined by
the user

Conflict
Resolution
Policy

Database policy

Handled by the
destination policy

Handled by the
destination policy

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QUERYING

Raven Query Language

RQL, with a SQL-like syntax and supports JavaScript as well.

Spatial Search

Search documents using geographical coordinates.

Auto-Indexes

Automatically generated indexes that continuously updated.

MoreLikeThis

Feed to MoreLikeThis to obtain documents with similar values.

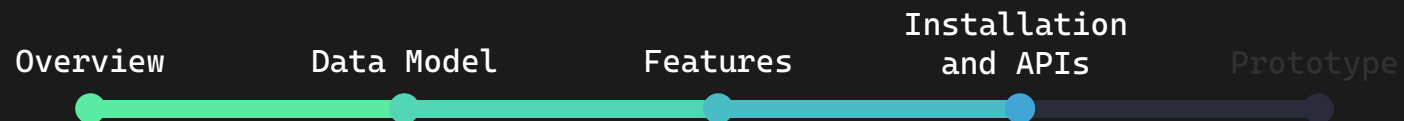
Facets

Perform aggregations and split them into ranges.

Full-Text Search

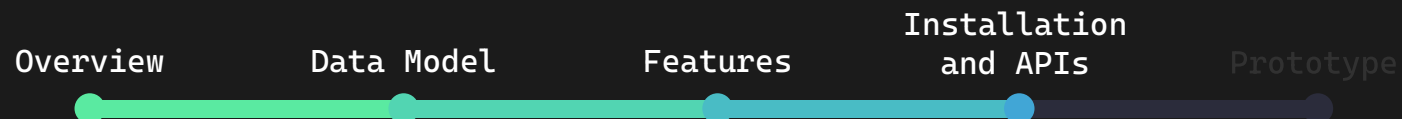
Advanced full-text search due to Lucene integration.

INSTALLATION AND APIs



INSTALLATION

- Can be directly installed or used with Docker (image: 'ravendb').
- Can be configured through the API, env. variables or through RavenDB Studio.



Documents

Indexes

Tasks

Settings

Stats

SERVER

Databases

Cluster Dashboard

Manage Server

About

What's new Update available

← COLLAPSE MENU

FILTER BY NAME

New database

e.g. database1

FILTER BY STATE

All 1 | Online 1 | Offline 0 | Errored 0 | Disabled 0 | Local (Node A) 1 | Remote 0

☐ SELECT ALL

ONLINE

☐

Pc-Parts

Manage group

Disable

343.25 MB

59,527

3

Never backed up

Nodes

A

Overview

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Indexes

Query

List of Indexes

Indexing Performance

Map-Reduce Visualizer

Index Cleanup

Index Errors 0

Query

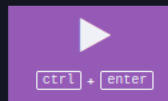
Syntax

```
1 from 'Products' as p
2 where search(name, 'Razer*')
```

Save...

Load Query

Settings



Press Shift+F11 to enter full screen mode

Results

Index 'Auto/Products/BySearch(name)AndSearch(p)AndcategoryAnddiscountAndpriceAndstock'

was used to get the results in <1 ms

Delete documents

Statistics

Export to file

Display

Expand results

Preview	@id	name	price	category	stock	attributes	reviews	discount	image
	products/224	Lian Li PC-O11 Dynamic...	290.8	case	17	{...} 5	[] 0	15	/products/case/1.jpg
	products/518	Razer Tomahawk ATX	138.45	case	16	{...} 4	[] 0	0	/products/case/1.jpg
	products/535	Razer Tomahawk Mini-L...	137.99	case	7	{...} 4	[] 0	50	/products/case/2.jpg
	products/1288	NZXT S340 Razer	138.45	case	20	{...} 5	[] 0	45	/products/case/1.jpg
	products/6327	Razer Kunai Chroma 3-...	145.38	case-fan	9	{...} 6	[] 0	60	/products/case-fan/3.jpg
	products/6450	Razer Kunai Chroma 3-...	32.07	case-fan	20	{...} 6	[] 0	0	/products/case-fan/4.jpg
	products/6578	Razer Kunai Chroma	57.63	case-fan	5	{...} 6	[] 0	60	/products/case-fan/2.jpg
	products/6616	Razer Kunai Chroma	92.04	case-fan	19	{...} 6	[] 0	15	/products/case-fan/2.jpg
	products/10223	Razer Hanbo Chroma	102.15	cpu-cooler	16	{...} 4	[] 0	5	/products/cpu-cooler/1.j...
	products/10358	Razer Hanbo Chroma	179.99	cpu-cooler	16	{...} 4	[] 0	25	/products/cpu-cooler/4.j...

Results 408



Overview

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APIs



C#



PHP



Python



Node.js



Java

Overview

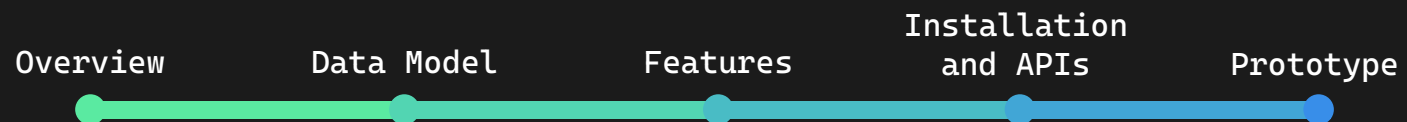
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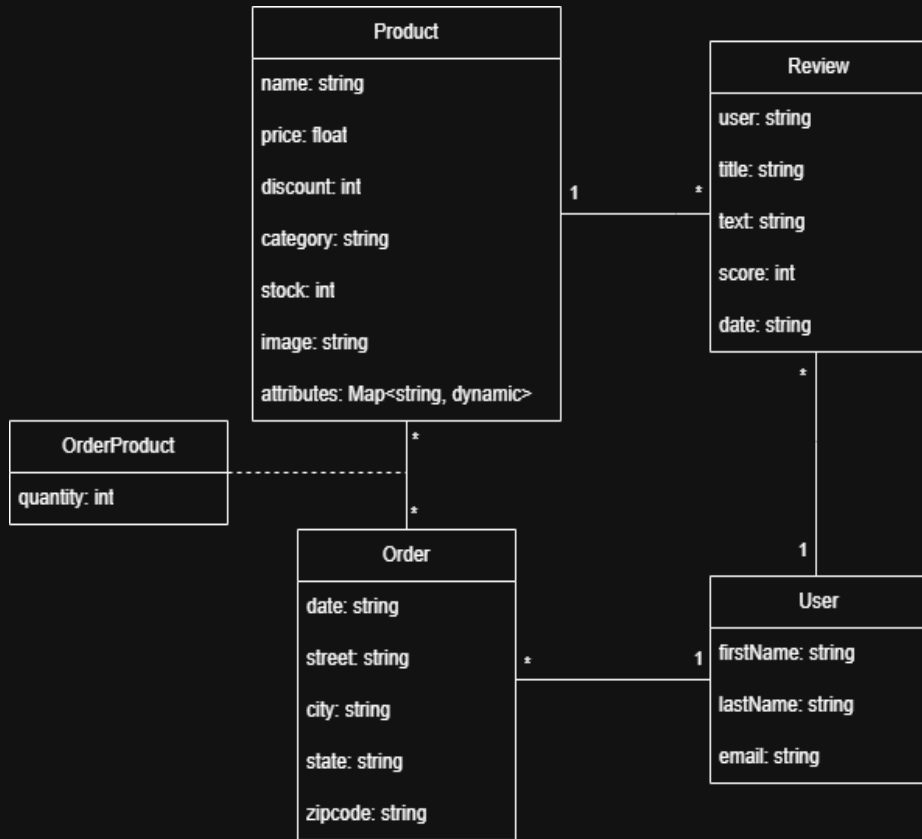
PROTOTYPE



OVERVIEW

- E-Commerce store, selling mostly computer hardware.
- Users can employ thorough searches, fill their carts, places orders and review products.





USER

```
{
  "firstName": "Nuno",
  "lastName": "Jesus",
  "email": "nuno.jesus@gmail.com",
  "orders": []
}
```

ORDER

```
{
  "date": "2025-05-17T12:24:46.190Z",
  "address": {
    "street": "Rua da Alegria",
    "city": "Porto",
    "state": "Gondomar",
    "zip": "4435-123"
  },
  "items": [
    {
      "name": "Intel Core i9-14900K",
      "price": 544.99,
      "category": "cpu",
      "stock": 4,
      "attributes": {
        "core_count": 24,
        "core_clock": 3.2,
        "boost_clock": 6,
        "tdp": 125,
        "graphics": "Intel UHD Graphics 770"
      },
      "reviews": [],
      "discount": 20,
      "image": "/products/cpu/intel-3.jpg",
      "id": "products/8369",
      "quantity": 1
    }
  ]
}
```

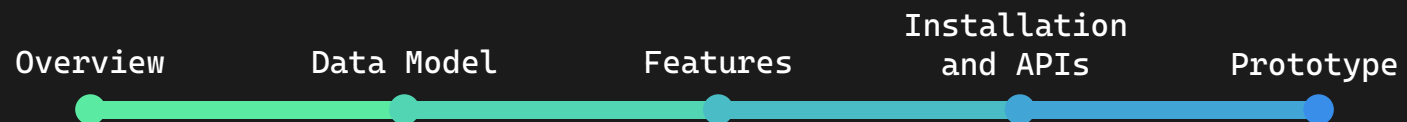
PRODUCT

```
{
  "name": "Fractal Design Ridge PCIe 4.0",
  "price": 129.99,
  "category": "case",
  "stock": 5,
  "attributes": {
    "type": "Mini ITX Tower",
    "color": "White",
    "side_panel": "Mesh",
    "external_volume": 16.3,
    "internal_35_bays": 0
  },
  "reviews": [],
  "discount": 20,
  "image": "/products/case/4.jpg",
}
```

REVIEW

```
{
  "user": "Anonymous",
  "rating": 5,
  "title": "Great product!",
  "text": "I love this product!",
  "date": "17-05-2025"
}
```

DEMO



Thank you!