Getting Started with Jakarta NoSQL and MongoDB

Michael P. Redlich
Who's Mike?

- BS in CS from **Rutgers**
- "Petrochemical Research Organization"
- InfoQ Java Queue News Editor
- Garden State Java User Group
- Jakarta EE Ambassadors

@mpredli  
#shareMPknowledge
Objectives

- What is Jakarta NoSQL?
- What is Eclipse JNoSQL?
- NoSQL Database Types
- Jakarta NoSQL Layers
- Demo (yea!)
- Jakarta NoSQL Resources
Jakarta NoSQL
What is Jakarta NoSQL (1)?

• Jakarta EE specification
  • Otavio Santana - specification lead
• Streamlines the integration of Java applications with NoSQL databases
• Defines a set of APIs that provide a standard implementation for most NoSQL databases
What is Jakarta NoSQL (2)?

- One API, many databases
- Adopted by the Garden State JUG!
Eclipse JNoSQL
What is JNoSQL?

• Compatible implementation of the Jakarta NoSQL specification
• One defined API for each NoSQL database type
• Uses the same annotations to map Java objects
NoSQL Database Types

• Column Family
• Document
• Graph
• Key-Value
Column Family

- Apollo
  - Duty
  - Sun
- Aphrodite
  - Duty
  - {Love, happy}
  - Color
- Ares
  - Duty
  - War
  - weapon
  - Sword
## Column Family

<table>
<thead>
<tr>
<th>Relational</th>
<th>Column Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table</td>
<td>Column Family</td>
</tr>
<tr>
<td>Row</td>
<td>Column</td>
</tr>
<tr>
<td>Column</td>
<td>Key/Value Pair</td>
</tr>
<tr>
<td>Relationship</td>
<td></td>
</tr>
</tbody>
</table>
{  
  "name": "Diana",
  "duty": [
    "Hunt",
    "Moon",
    "Nature"
  ],
  "age": 1000,
  "siblings": {
    "Apollo": "brother"
  }
}
<table>
<thead>
<tr>
<th>Relational</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table</td>
<td>Collection</td>
</tr>
<tr>
<td>Row</td>
<td>Document</td>
</tr>
<tr>
<td>Column</td>
<td>Key/Value Pair</td>
</tr>
<tr>
<td>Relationship</td>
<td>Link</td>
</tr>
</tbody>
</table>
# Graph

<table>
<thead>
<tr>
<th>Relational</th>
<th>Graph</th>
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</thead>
<tbody>
<tr>
<td>Table</td>
<td>Vertex &amp; Edge</td>
</tr>
<tr>
<td>Row</td>
<td>Vertex</td>
</tr>
<tr>
<td>Column</td>
<td>Vertex &amp; Edge Property</td>
</tr>
<tr>
<td>Relationship</td>
<td>Edge</td>
</tr>
</tbody>
</table>
Key-Value

Apollo: Sun
Ares: War
Aphrodite: Love, Beaty
### Key-Value

<table>
<thead>
<tr>
<th>Relational</th>
<th>Key-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table</td>
<td>Bucket</td>
</tr>
<tr>
<td>Row</td>
<td>Key/Value Pair</td>
</tr>
<tr>
<td>Column</td>
<td></td>
</tr>
<tr>
<td>Relationship</td>
<td></td>
</tr>
</tbody>
</table>
Jakarta NoSQL Layers

- Communication
  - formerly known as “Diana”
- Mapping
  - formerly known as “Artemis”
Jakarta NoSQL Layers
Communication Layer

- A set of APIs that defines communications with NoSQL databases
- Contains modules representing the four NoSQL database types
- May be compared to the JDBC APIs in the relational database world
Mapping Layer

- A set of APIs that map Java objects to NoSQL databases
- Incorporates Jakarta CDI and Jakarta Bean Validation specifications
- Annotation driven
- May be compared to JPA and ORM in the relational database world
Scalability vs. Complexity

- key-value
- Column
- Document
- Graph
## Supported NoSQL Databases

<table>
<thead>
<tr>
<th>ArangoDB</th>
<th>Apache TinkerPop</th>
<th>bladegraph</th>
<th>basho</th>
<th>Tom Sawyer Software</th>
<th>cassandra</th>
<th>Couchbase</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Graph</td>
<td>CouchDB relax</td>
<td>Infinispan</td>
<td>elastic</td>
<td>GRAN.AI</td>
<td>hazelcast</td>
<td>Apache HBase</td>
</tr>
<tr>
<td>Azure Cosmos DB</td>
<td>Stardog</td>
<td>TITAN</td>
<td>janusGraph</td>
<td>KeyLines Network Insight</td>
<td>LINKURIOUS</td>
<td>Neo4j</td>
</tr>
<tr>
<td>MongoDB</td>
<td>Solr</td>
<td>Scylla</td>
<td>neo4j</td>
<td>ORACLE NO SQL DATABASE</td>
<td>OrientDB</td>
<td>Redis</td>
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<tr>
<td>riak</td>
<td>RAVENDB</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Live Demo
Current Status of Jakarta NoSQL

• In development
• Version 1.0.0-b3
• Migrate to JDK 11 after the release of Jakarta EE 9.1
Jakarta NoSQL Resources

- https://jakarta.ee/specifications/nosql/
- https://www.youtube.com/watch?v=EXQfO-y52_0
- https://www.baeldung.com/eclipse-jnosql
Want to Get Involved?

- Contribute!
- Fork the nosql repository
  - https://github.com/eclipse-ee4j/nosql
Acknowledgements

• Otavio Santana
Contact Info

mike@redlich.net
@mpredli
redlich.net
redlich.net/portfolio
github.com/mpredli01
Thanks!