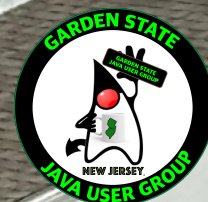


Getting Started with Jakarta No SQL and MongoDB

Michael P. Redlich | @mpredli



JAKARTA® EE

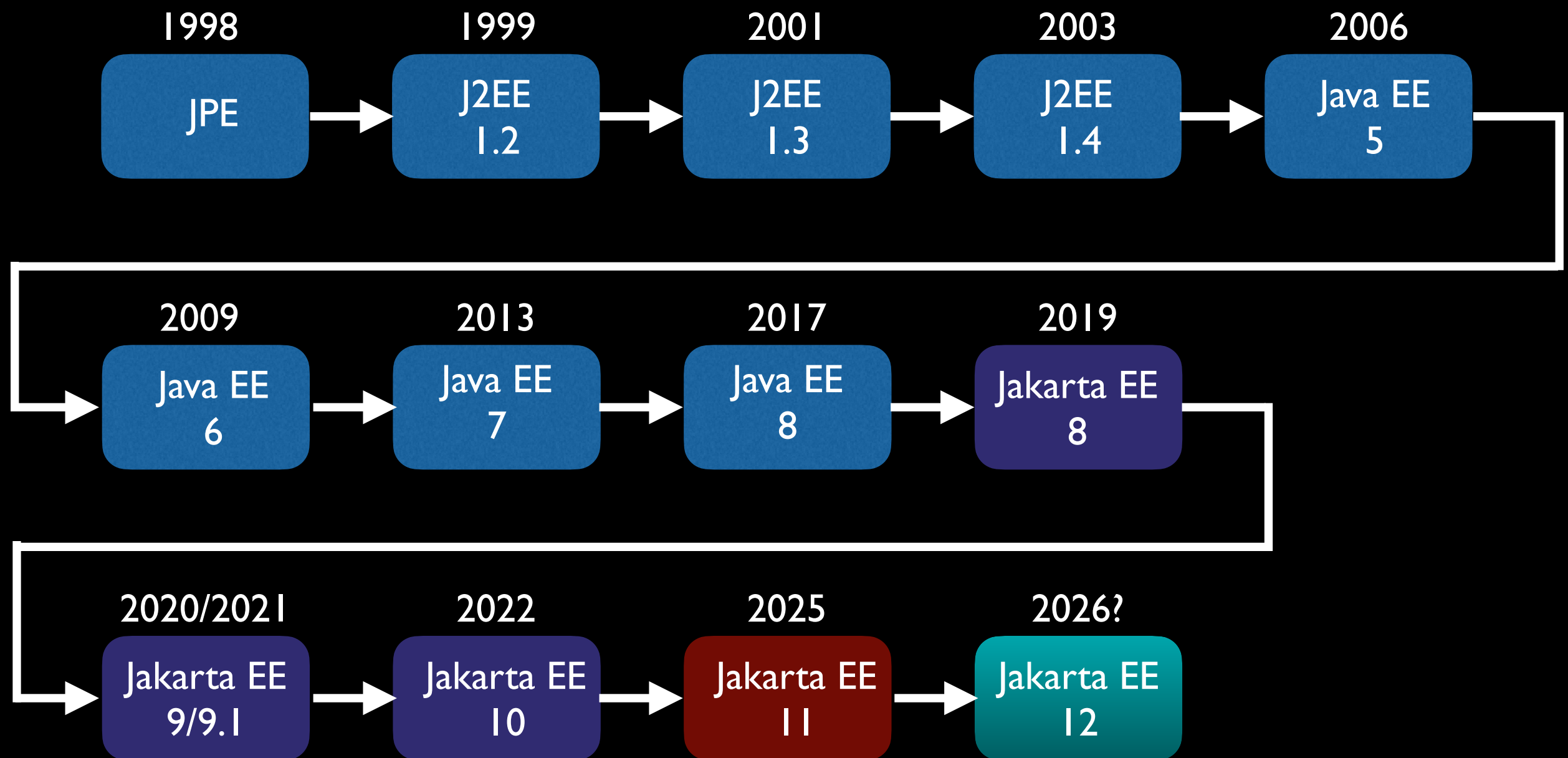


InfoQ



payara®

Evolution of Java EE/Jakarta EE

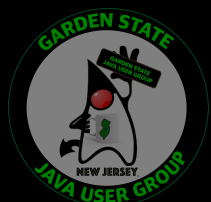




Hi, I'm Mike



- Java Champion
- Lead Java Queue News Editor: **InfoQ**
- Contract Dev Advocate and Tech Writer: **Payara**
- Director: **Garden State Java User Group**
- Leadership Council: **Jakarta EE Ambassadors**
- Committer: **Jakarta NoSQL and Jakarta Data**
- Author: **Helidon Revealed: A Practical Guide to Oracle's Microservices Framework**



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Poll

- I'm a Jakarta EE Expert!
- I've built an application using Jakarta EE
- I'm familiar with Jakarta EE, but haven't used it
- I've heard some things about Jakarta EE
- What the heck is Jakarta EE?



Objectives

- What is MongoDB?
- What is Jakarta NoSQL?
- What is Eclipse JNoSQL?
- NoSQL Database Types
- Jakarta NoSQL Layers
- What is Jakarta Data?



MongoDB



`{name: "mongo", type: "DB"}`

What is MongoDB?

- An open-source document database that provides high performance, high availability, and automatic scaling
- It's name derived from “humongous”
- Written in C++



Live Demo



InfoQ





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Jakarta NoSQL

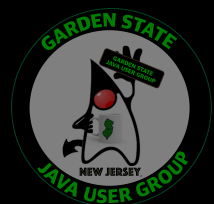


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What is Jakarta NoSQL? (i)

- Jakarta EE specification
 - Otávio 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? (ii)

- Approved in October 2020
 - choosing Eclipse JNoSQL as its implementation was a natural fit
- One API, many databases
- Adopted by the Garden State JUG!



Current Status

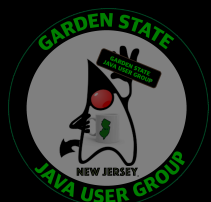
- In development supporting Jakarta EE 11
- Version 1.0.0-M1
- Targeting Jakarta EE 12 for inclusion on the Jakarta EE Platform



Objectives

- What is MongoDB? ✓
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Eclipse JNoSQL



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What is Eclipse JNoSQL?

(i)

- Compatible implementation of the Jakarta NoSQL specification
- Introduced in March 2017
- Originally planned to be a community project led by Otávio Santana under the auspices of the Java Community Process



What is Eclipse JNoSQL?

(ii)

- One defined API for each NoSQL database type
- Uses the same annotations to map Java objects
- Current version: 1.1.4



Objectives

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NoSQL Database Types

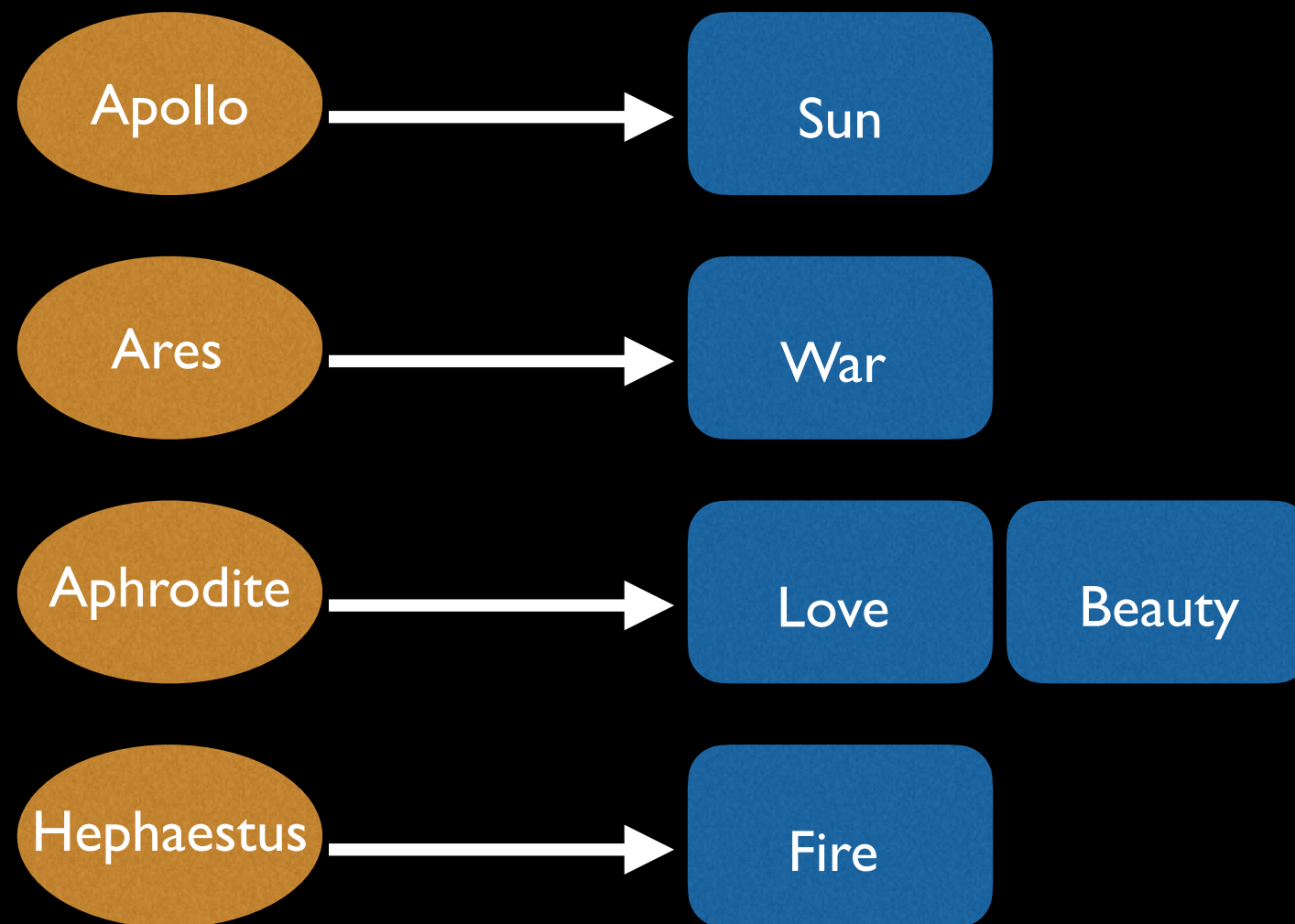


NoSQL Database Types

- Key-Value
- Column Family
- Document
- Graph



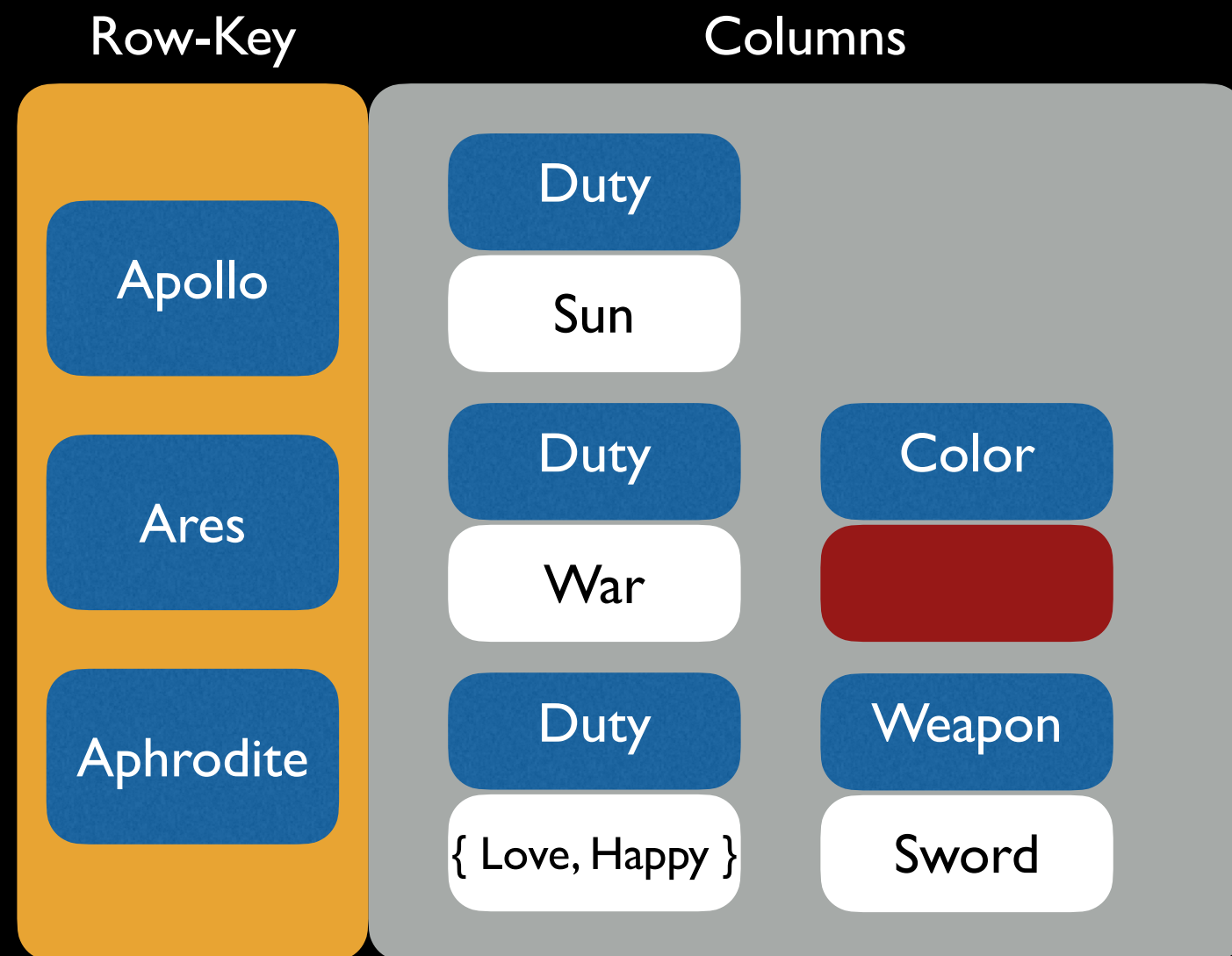
Key-Value



Key-Value

Relational	Key-Value
Table	Bucket
Row	Key/Value Pair
Column	
Relationship	

Column Family



Column Family

Relational	Column Family
Table	Column Family
Row	Column
Column	Key/Value Pair
Relationship	

Document

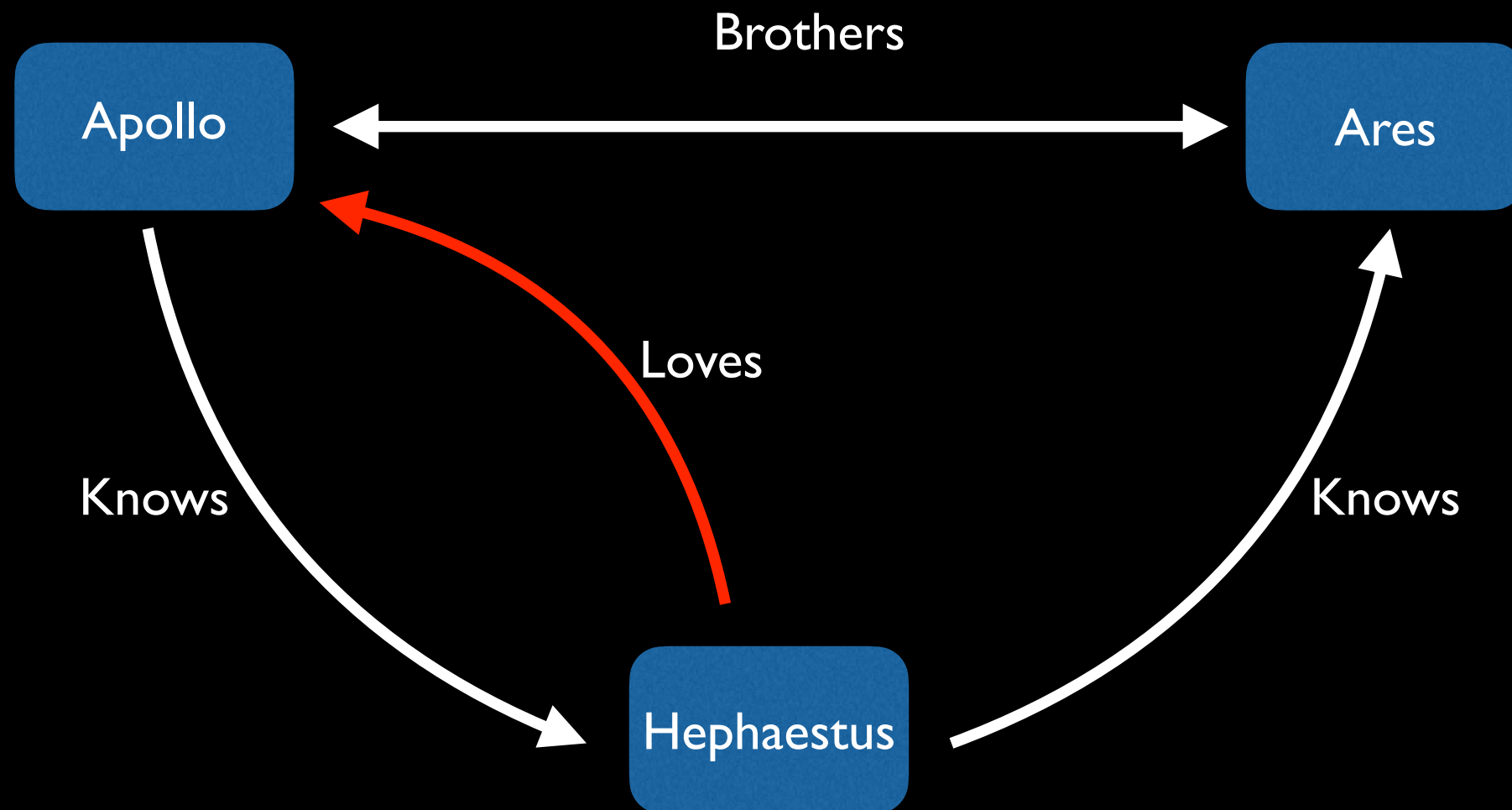
```
{  
  "name": "Diana",  
  "duty": [  
    "Hunt",  
    "Moon",  
    "Nature"  
  ],  
  "age": 1000,  
  "siblings": {  
    "Apollo": "brother"  
  }  
}
```



Document

Relational	Document
Table	Collection
Row	Document
Column	Key/Value Pair
Relationship	Link

Graph



Graph

Relational	Graph
Table	Vertex & Edge
Row	Vertex
Column	Vertex & Edge Property
Relationship	Edge



Objectives

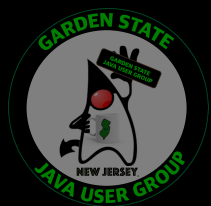
- What is MongoDB? ✓
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- NoSQL Database Types ✓
- Jakarta NoSQL Layers
- What is Jakarta Data?

Jakarta NoSQL Layers

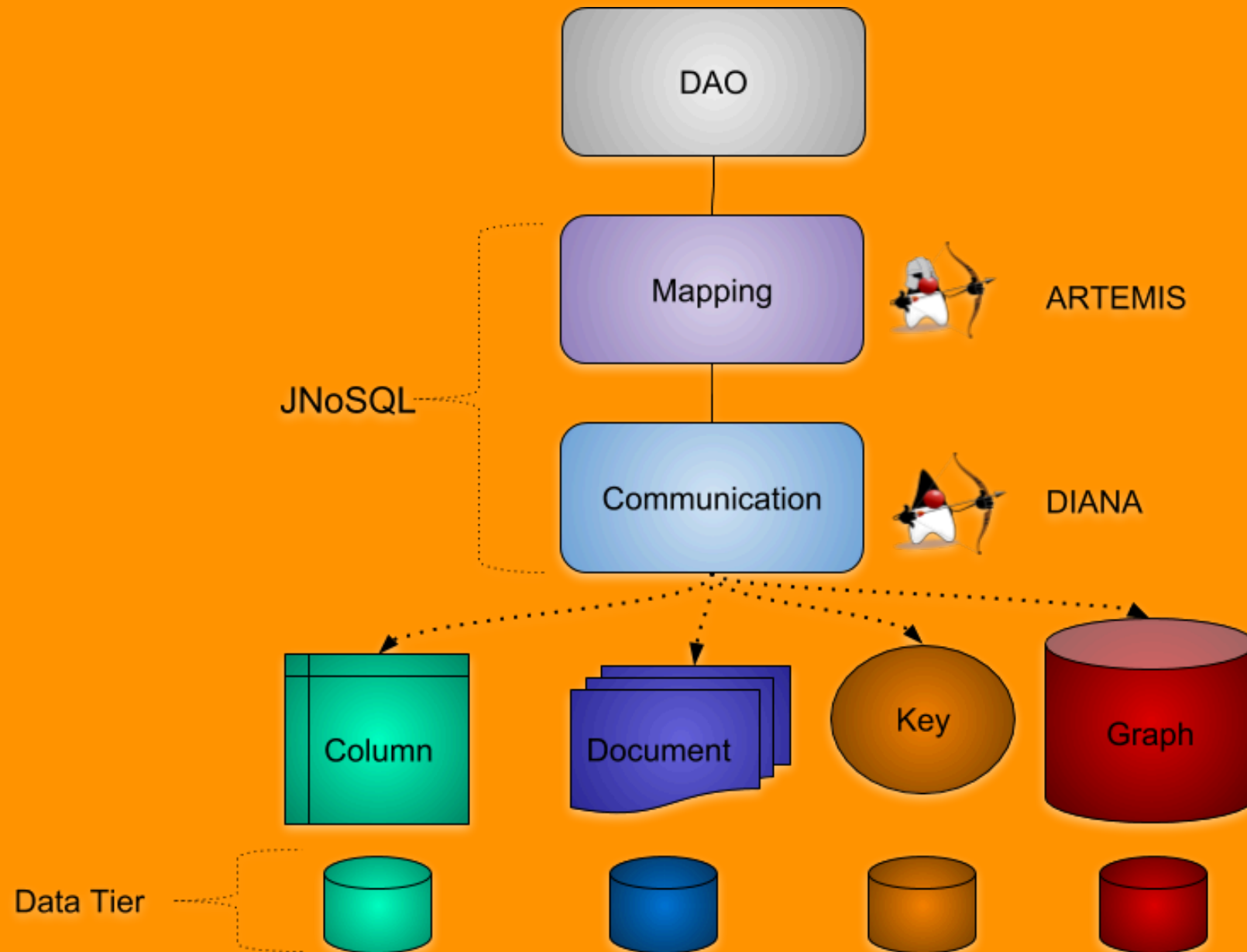


Jakarta NoSQL Layers (i)

- Communication
 - formerly known as “Diana”
- Mapping
 - formerly known as “Artemis”



Jakarta NoSQL Layers (ii)



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

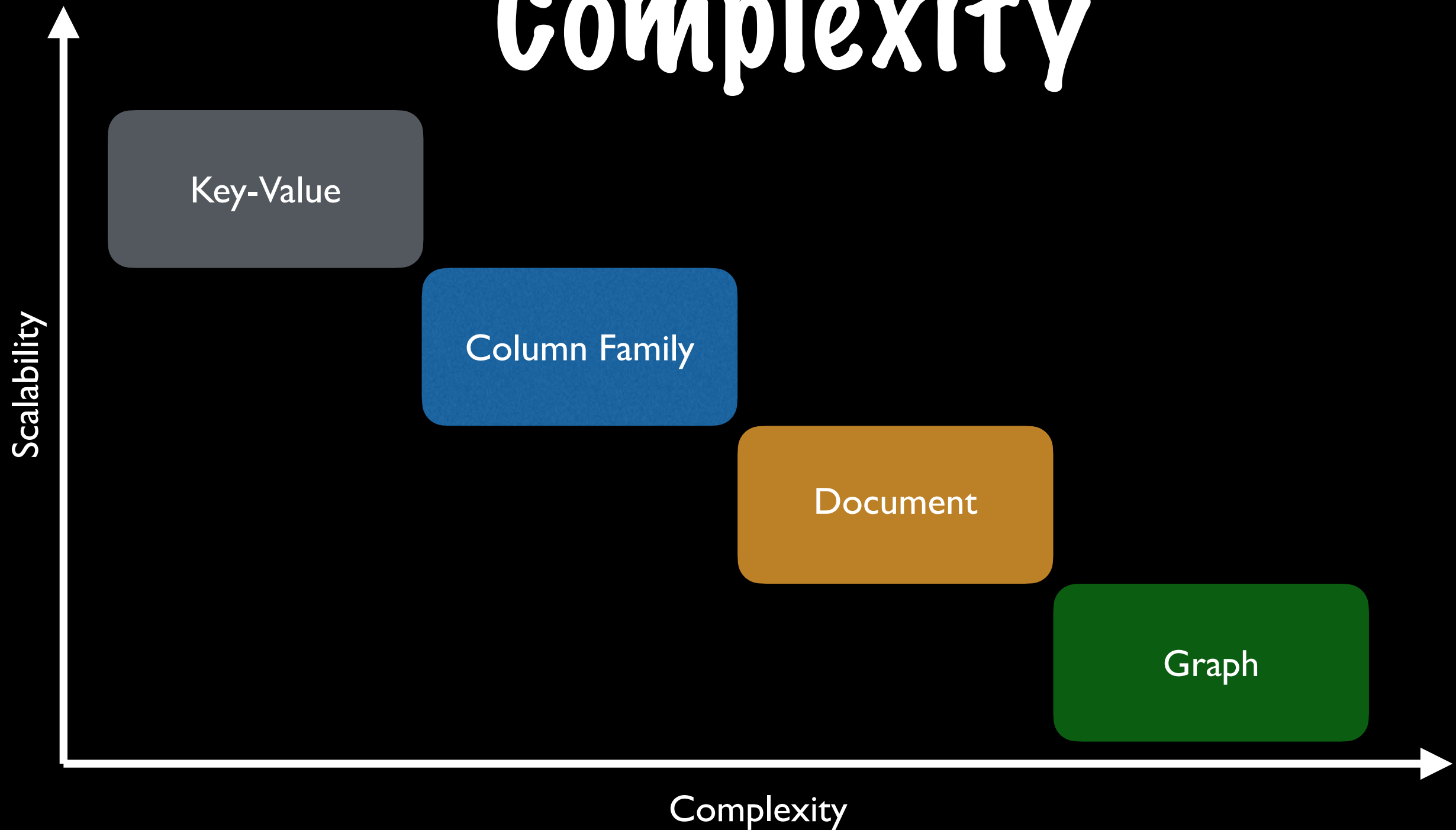


Mapping Layer

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



Scalability vs. Complexity



Supported NoSQL Databases

 ArangoDB	 Apache TinkerPop	 blazegraph™	 basho	 Tom Sawyer SOFTWARE	 cassandra	 Couchbase
 IBM Graph™	 CouchDB relax	 Infinispan	 elastic	 GRAKN.AI	 hazelcast	 APACHE HBASE
 Azure Cosmos DB	 Stardog	 TITAN	 JanusGraph	 KeyLines NETWORK INSIGHT	 LINKURIOUS VISUALIZE GRAPH DATA EASILY	 M
 mongoDB.	 Solr	 SCYLLA.	 neo4j	 ORACLE® NOSQL DATABASE	 OrientDB®	 redis
 riak	 RAVENDB					

Objectives

- What is MongoDB? ✓
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Jakarta Data



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What is Jakarta Data?

(i)

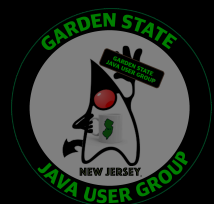
- A new Jakarta EE specification!
- Define core APIs for the Jakarta EE platform that would allow applications and other Jakarta EE components to access to data technologies, such as:
 - relational and NoSQL databases
 - cloud-based data services



What is Jakarta Data?

(ii)

- Provides an API that allows easy access to database technologies
- Can split the persistence from the model with several features, such as the ability to compose custom query methods on a **Repository** interface where the framework will implement it



What's New? (i)

- Support for CDI extensions
- New `BasicRepository` interface
- New `insert()` and `update()` methods in the `CrudRepository` interface
- New `@Insert`, `@Update`, `@Delete` and `@Save` annotations



What's New? (ii)

- Jakarta Data Query Language (JDQL)
 - a simple language designed to be used inside the `@Query` annotation to specify the semantics of query methods of Jakarta Data repositories
 - a subset of Jakarta Persistence Query Language (JPQL)



Compatible Implementations

- Current version: 1.0
- Compatible implementations:
 - Open Liberty 24.0.0.6
 - Hibernate ORM 6.6.0.Final



Live Demo



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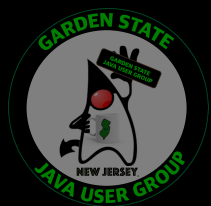
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Resources (i)

- Jakarta NoSQL Specification
- Introducing Jakarta NoSQL
 - Diogo Carleto
- Eclipse JNoSQL: The Definitive Solution for Java and NoSQL Database
 - Otávio Santana and Rafael Del Nero



Resources (ii)

- A Guide to Eclipse JNoSQL
 - Eugen Paraschiv (Baeldung)
- Jakarta EE II Example Applications
 - Michael Redlich



Want to Get Involved?

- Contribute to open source!



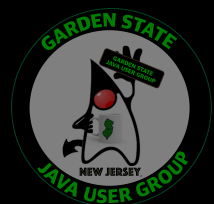
- Share
- Embrace
- Engage
- Develop

Tanja Obradovic
Jakarta EE Program Manager at
Eclipse Foundation

- Share your own Jakarta EE experiences!

Committers

- Otávio Santana (lead)
- Andres Galante
- Fred Rowe
- Guarav Gupta
- Ivan Junckes Filho
- Jesse Gallagher
- Nathan Rauh
- Verner Keil
- Michael Redlich
- Leonardo Lima (historical)
- Wayne Beaton (mentor)



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- Reza Rahman
- Otávio Santana
- Arjan Tijms
- Adam Yoho



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Thanks!

