ArangoDB Foxx: Building APIs on top of ArangoDB

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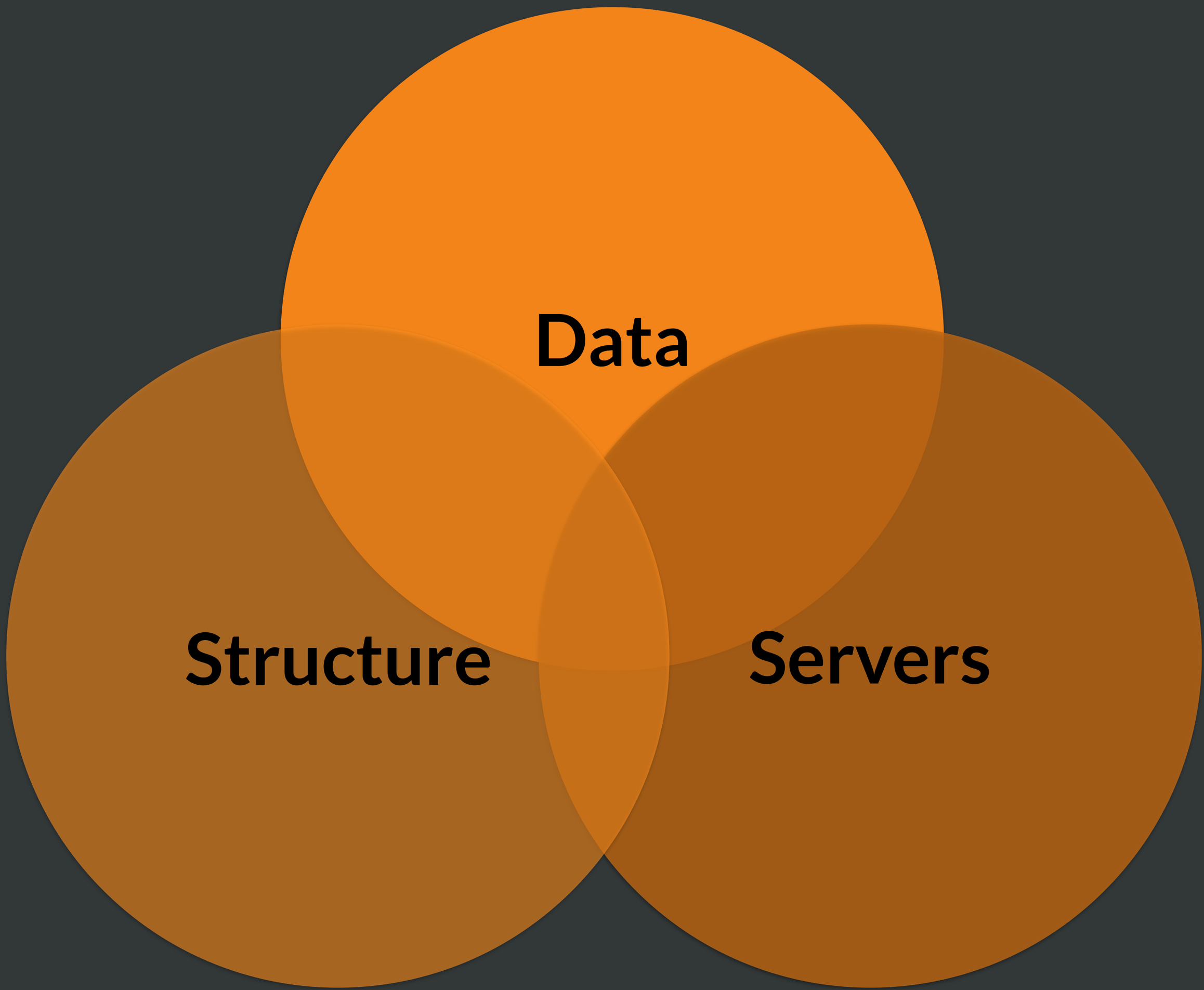
NoSQL
is not one thing

NoSQL
does not mean
you can't do
joins

NoSQL
does not mean
you can't do
transactions


Data
Structure
Servers

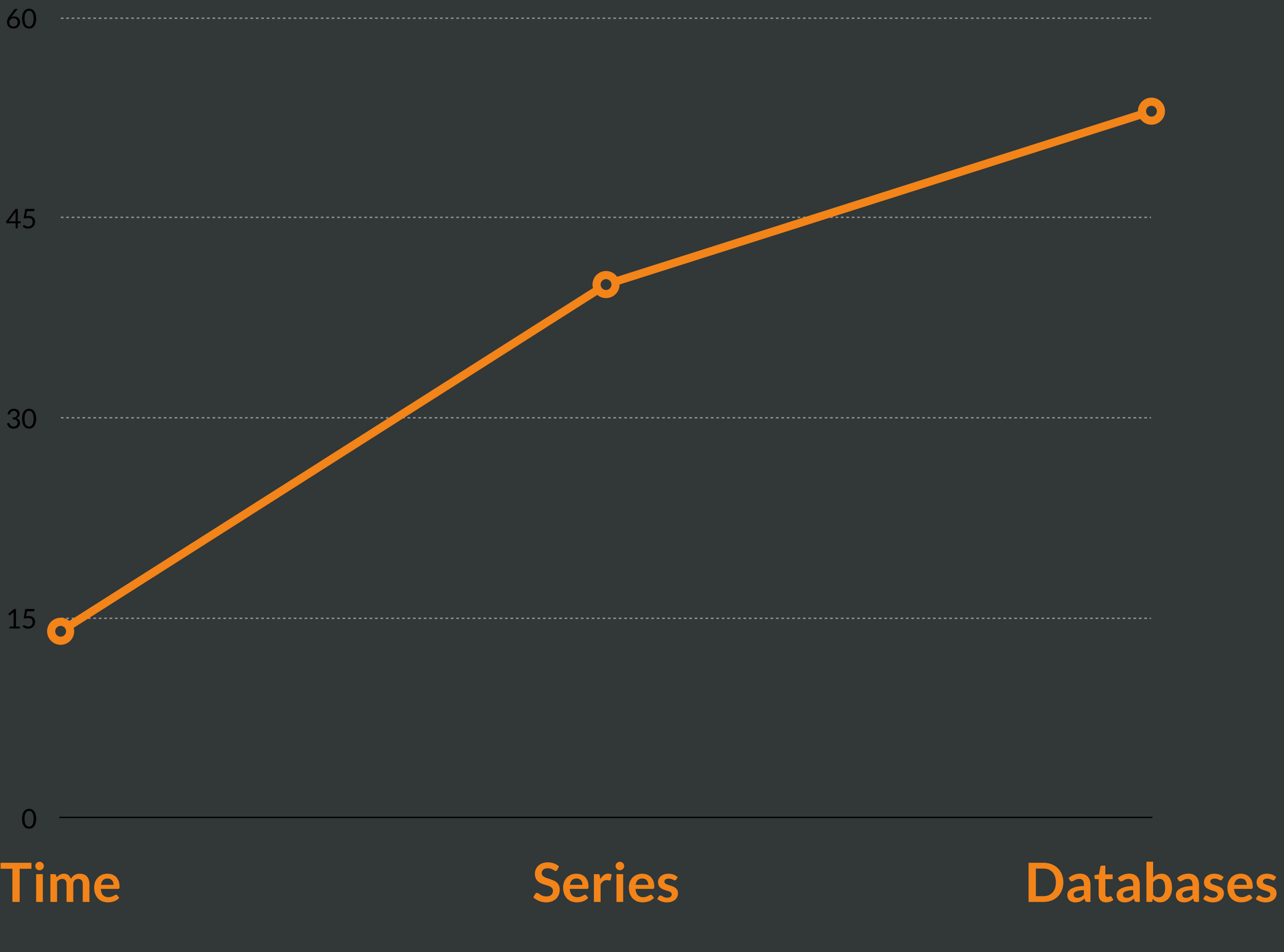
Databases

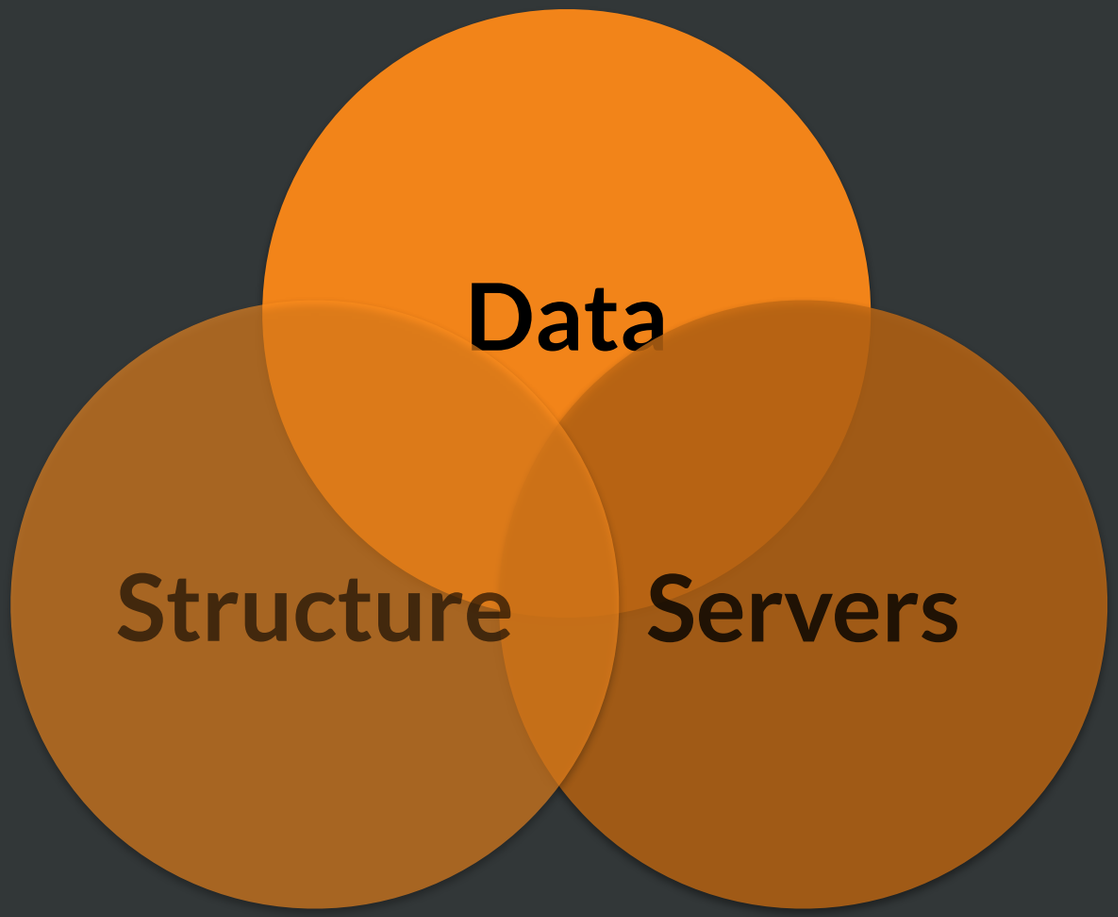
Graph

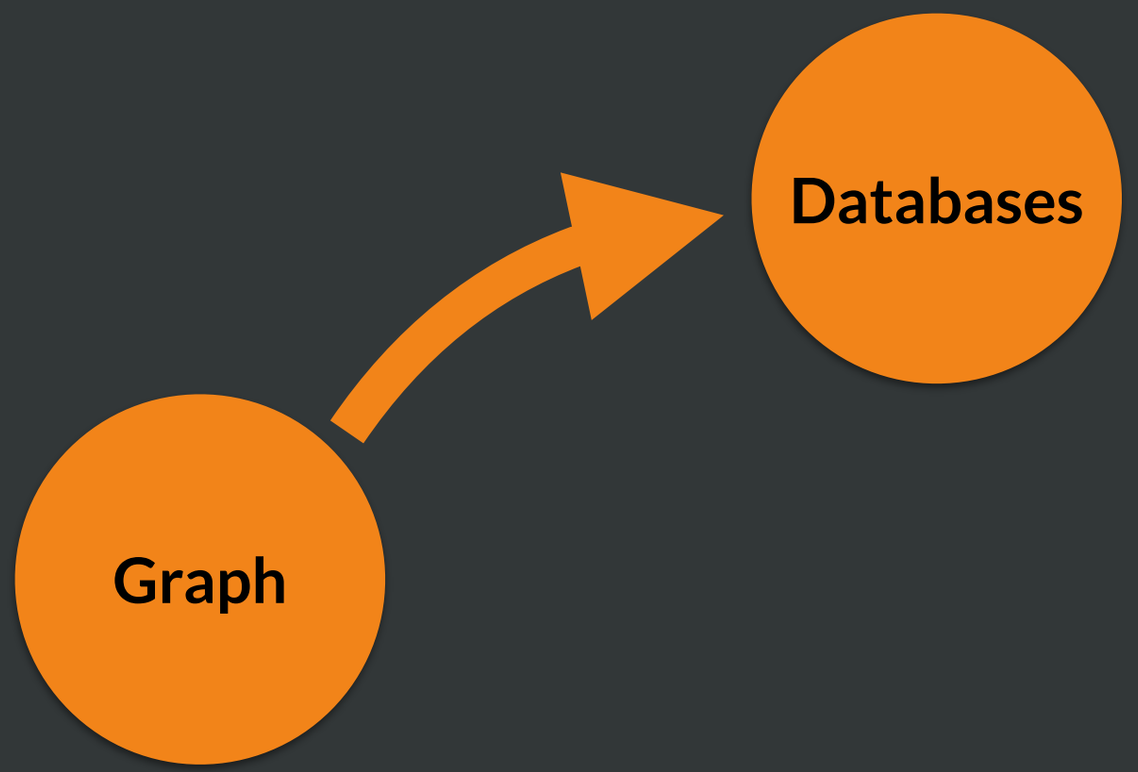
Aggregate

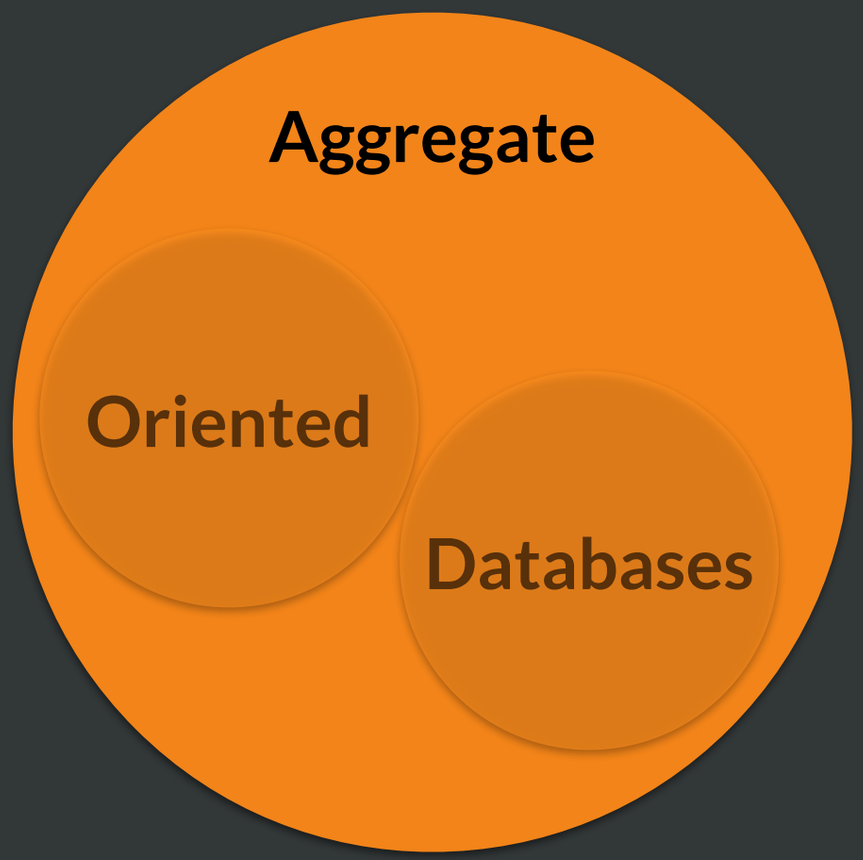
Oriented

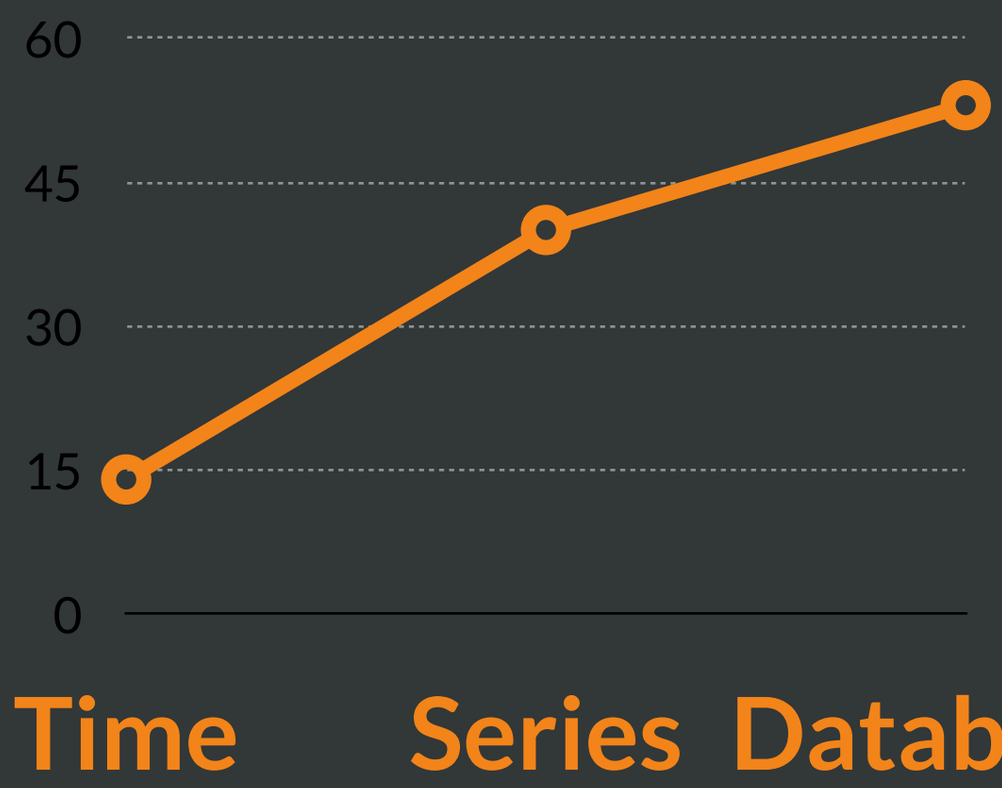
Databases


60
45
30
15
0
Time
Series
Databases


Data
Structure
Servers


Databases
Graph


Aggregate
Oriented
Databases


60
45
30
15
0
Time Series Databases

Multi

Data

Structure

Servers

Graph

Databases

Aggregate

Oriented

Databases

Model

60

45

30

15

0

Time Series Databases

Why combine aggregate and graph?

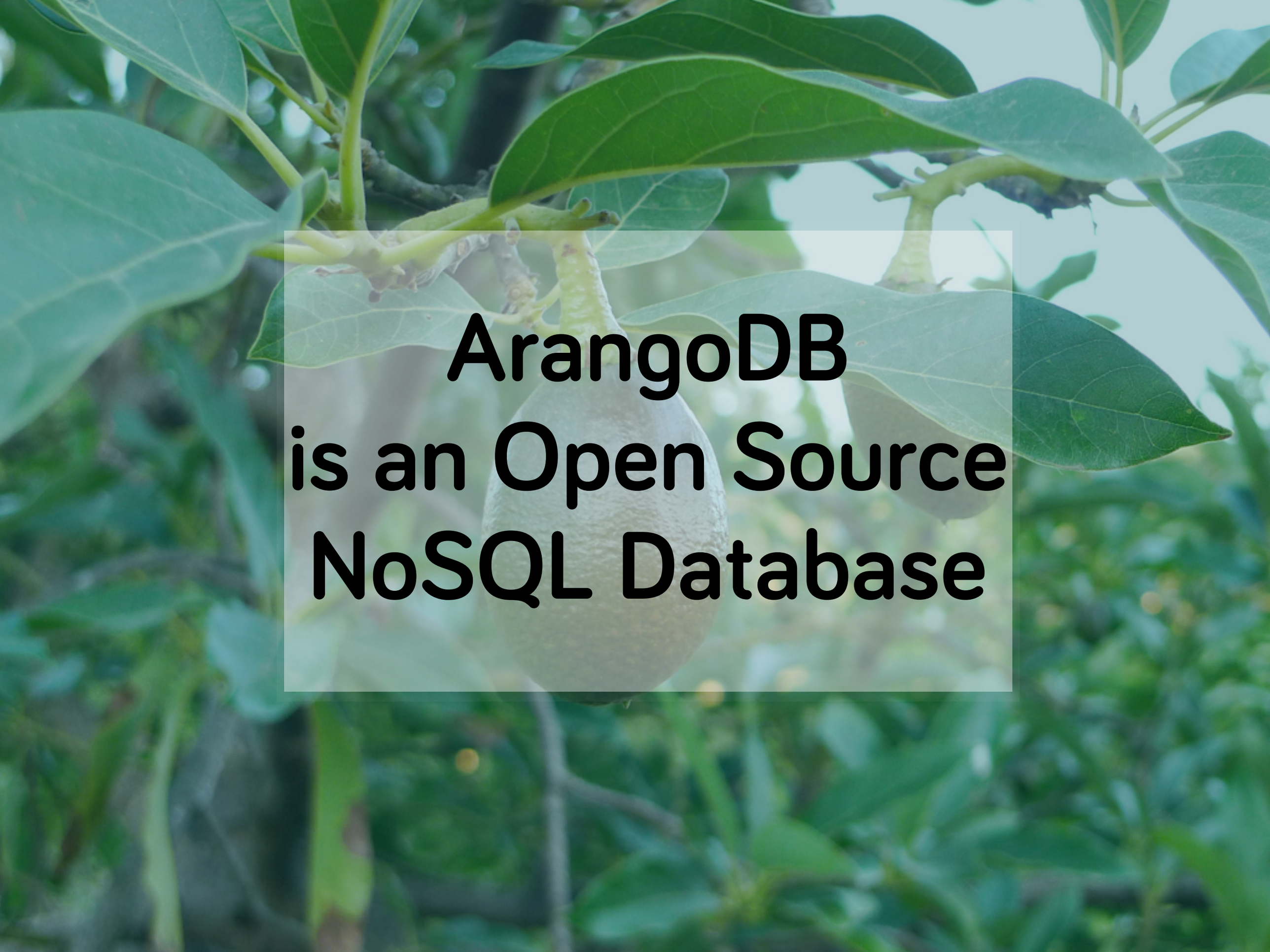
	Entity	Value Object
Identified by…	**Add an edge to me!**	**Embed me!**
State is…	Mutable	Immutable

Hi.

I’m Lucas.

I work for ArangoDB GmbH

We build ArangoDB



ArangoDB is an Open Source NoSQL Database

space efficient

sharding

multimodel

open source

transactions

ArangoDB

free

C++

joins

JavaScript

master-slave replication

AQL

```
FOR user IN users
  FILTER user.active == true
  RETURN {
    name: user.name
  }
```

```
FOR u IN users
  FILTER u.active == true
  LIMIT 0, 4
  FOR f IN relations
    FILTER f.type == "friend" && f.from == u.id
  RETURN {
    "user" : u.name,
    "friendId" : f.to
  }
```

```
FOR u IN users
  LET userRelations = (
    FOR p IN PATHS(
      users,
      relations,
      "OUTBOUND"
    )
    FILTER p._from == u._id
    RETURN p
)
RETURN {
  "user" : u,
  "relations" : userRelations
}
```

JS **extends** ArangoDB

Multi Collection **Transactions**

Individual Graph **Traversals**

Extending the **Web API**

App 1

App 1

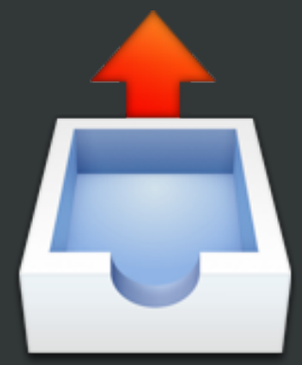
App 2

App 1

App 2

App 1

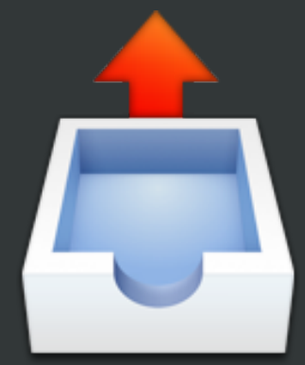
App 2



App 1

App 2

Mobile



Structured

Controller

```
Foxx = require("org/arangodb/foxx");
```

```
Foxx = require("org/arangodb/foxx");

controller = new Foxx.Controller(appContext);
```

```
Foxx = require("org/arangodb/foxx");

controller = new Foxx.Controller(appContext);

controller.get("/users", function(req, res) {
});
```

```
Foxx = require("org/arangodb/foxx");

controller = new Foxx.Controller(appContext);

controller.get("/users", function(req, res) {
  res.json({
    hello: "world"
  });
});
```

Parameterize your routes

```
Foxx = require("org/arangodb/foxx");

controller = new Foxx.Controller(appContext);

controller.get("/users", function(req, res) {
  res.json({
    hello: "world"
  });
});
```

```
Foxx = require("org/arangodb/foxx");

controller = new Foxx.Controller(appContext);

controller.get("/users/:name", function(req, res) {
  res.json({
    hello: "world"
  });
});
```

```
Foxx = require("org/arangodb/foxx");

controller = new Foxx.Controller(appContext);

controller.get("/users/:name", function(req, res) {
  res.json({
    hello: req.params("name");
  });
});
```

Annotate your routes

```
controller.get("/users/:name", function(req, res) {
  res.json({
    hello: req.params("name");
  });
});
```

```
controller.get("/users/:name", function(req, res) {
  res.json({
    hello: req.params("name");
  });
});pathParam("name", {
   type: joi.string().description("Name of the User")
});
```

```
/** What's my name?
 *
 * This route knows it.
 */
controller.get("/users/:name", function(req, res) {
  res.json({
    hello: req.params("name");
  });
}).pathParam("name", {
   type: joi.string().description("Name of the User")
});
```

Model

Layer

Domain Models

Foxx.Model

Persistence

Foxx.Repository

Foxx.Model

- Representation of the data
- Convenience Methods
- Validation

Foxx.Repository

- Save and Retrieve Data
- Simple Queries
- Define your own queries

Full Access To Simple Queries

Full Access To AQL

Full Access To Traversals

Full Access To ArangoDB

Background Worker

Authentication

Module

Applications

Active

- aardvark (system) — active
- aye-aye (dev) — development
- cerberus (system) — active
- gharial (system) — active
- sessions (system) — active
- simple-auth (system) — active
- users (system) — active

Available

- aardvark (system)
- aye_aye
- cerberus (system)
- gharial (system)
- oauth2
- sessions (system)
- sessions-example-app
- simple-auth (system)
- users (system)

FoxxGenerator

uses statemachines
to create REST APIs

REST

by **Fielding** (not DHH)

Representational state transfer

Let's
talk
about
state

How do we get from **state** to **state**?

hyperlinks

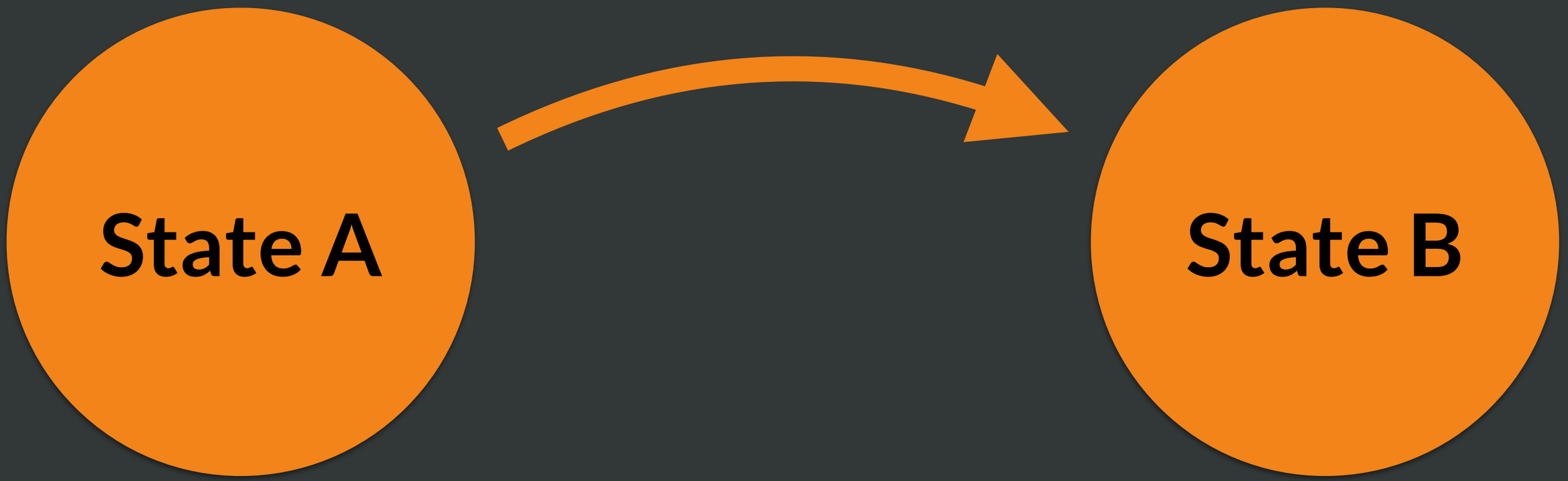
JSON doesn't have links.

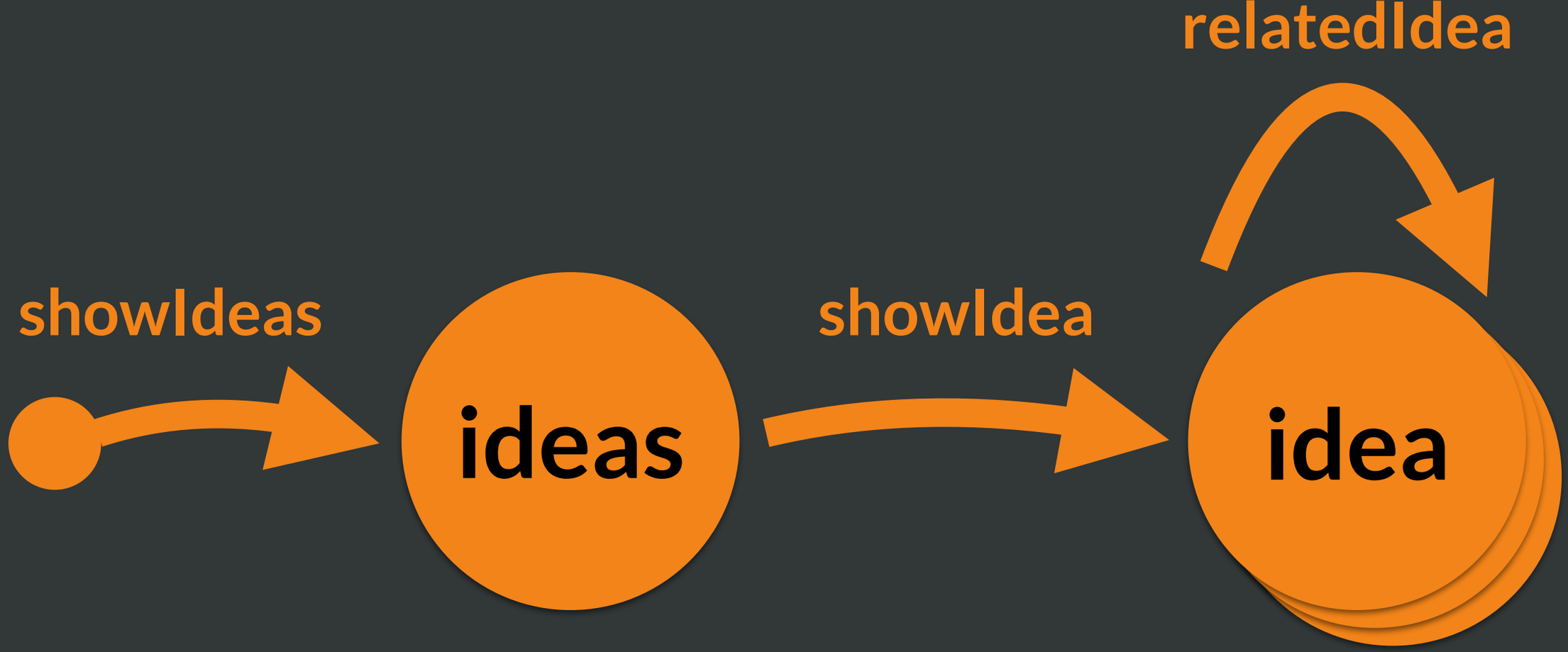
Siren & **HAL** have.

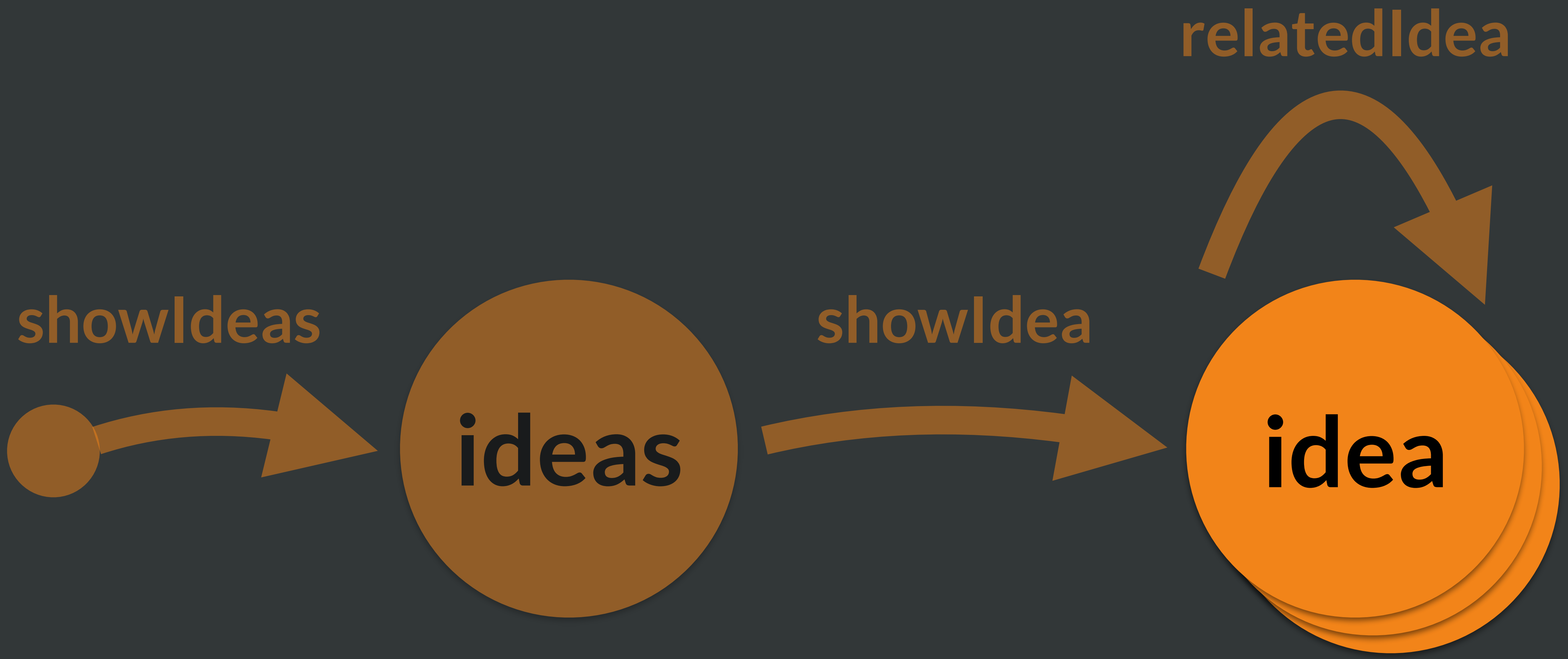
Why choose one of those standards?

To use existing libraries

How do we get from **state** to **state**?




relatedIdea
showIdeas
showIdea
ideas
idea



parameterized

A ~~single~~ entity

relatedIdea

showIdeas

showIdea

ideas

idea

A repository of entities

```
generator.addStartState({
  transitions: [
    { to: 'ideas', via: 'showIdeas' },
  ]
});

generator.addState('ideas', {
  type: ‘repository',
  contains: 'idea',

  transitions: [
    { to: 'idea', via: 'showIdea' }
  ]
});
```

```
generator.addState('idea', {
  type: 'entity',
  parameterized: true,
  containedIn: 'ideas',

  attributes: {
    title: Joi.string().required(),
    description: Joi.string().required()
  },

  transitions: [
    { to: 'idea', via: 'relatedIdea' }
  ]
});
```

Every state is a...

repository,

entity

or

service

An **entity** has attributes

A **service** has an action

```
/** Get a list of all ideas
*
* This will show you a list of all ideas
that are currently available.
*/
generator.defineTransition('showIdeas');
```

A transition can be a **follow** transition

A transition can be a **connect** transition

A transition can be a **disconnect** transition

A transition can be a **modify** transition

A transition
can have a
precondition

A transition
can have
parameters

You:

1. Choose **Media Type**
2. Define **Transitions**
3. **Document** Transitions
4. Describe **Statemachine**
5. Generate

FoxxGenerator:

- Generates collections
- Generates underlying graph
- Generates models and repositories
- Generates all routes
- Uses correct status codes
- Gives error responses
- Validates input parameters
- Follows selected standard
- Generates interactive documentation

How?

- The description is in the file system
  - Use Git!
  - Either only generate the initial version and then use Foxx for Rapid Prototyping
    - or evolve it
- Can be combined with a Foxx app

When?

Christmas

Release

Thanks for listening

https://www.arangodb.com/download

I have stickers!

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@moonbeamlabs on Twitter
moonglum on Github