ArangoDB Foxx

Creating APIs for Single Page Web Applications

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Single Page Web Applications

The Idea

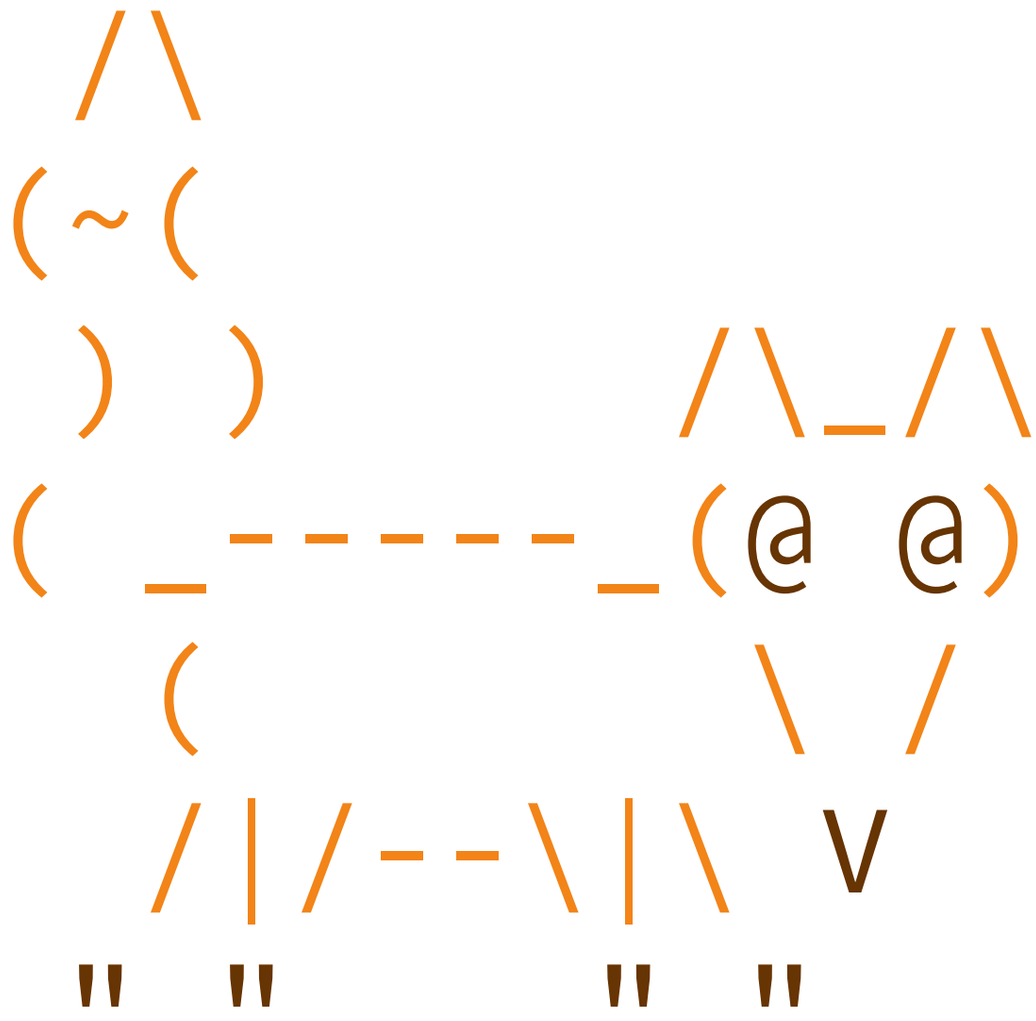
- What if we could talk to the database directly?
- It would only need an API
- What if we could define this API in JavaScript?

Single Page Web Applications

This doesn‘t mean its a Rails/… Killer

What is  ArangoDB ?

- Free and Open Source...
- ... Document and Graph Store...
- ... with embedded JavaScript...
- ... and an amazing query language



- An easy way to define REST APIs on top of ArangoDB
- Tools for developing your single page web application

Why another solution?

- ArangoDB Foxx is streamlined for API creation – not a Jack of all trades
- It is designed for front end developers: Use JavaScript, you already know that (without running into callback hell *cough* Node.js)

Foxx.Application

```
FoxxApplication = require("org/arangodb/foxx").Application;
```

```
FoxxApplication = require("org/arangodb/foxx").Application;

app = new FoxxApplication();
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FoxxApplication = require("org/arangodb/foxx").Application;

app = new FoxxApplication();

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

```
FoxxApplication = require("org/arangodb/foxx").Application;

app = new FoxxApplication();

app.get("/users", function(req, res) {
  res.set("Content-Type", "text/plain");
});
```

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FoxxApplication = require("org/arangodb/foxx").Application;

app = new FoxxApplication();

app.get("/users", function(req, res) {
  res.set("Content-Type", "text/plain");
  res.body = "Worked!";
});
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});

app.start(applicationContext);
```

Parameterize the routes

- You may want a route like `users/:id`...
- ...and then access the value of `id` easily

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app = new FoxxApplication();

app.get("/users/:id", function(req, res) {
  res.set("Content-Type", "text/plain");
  res.body = "Worked: " + req.params("id");
});

app.start(applicationContext);
```

Manifest.json

- In your Foxx.Application you describe your routes
- But your application can consist of multiple Foxx.Applications
- … and you also want to deliver assets and files

```
{
  "name": "my_website",
  "version": "1.2.1",
  "description": "My Website with a blog and a shop",
  "thumbnail": "images/website-logo.png",

  "apps": {
    "/blog": "apps/blog.js",
    "/shop": "apps/shop.js"
  },

  "assets": {
    "application.js": {
      "files": [
        "vendor/jquery.js",
        "assets/javascripts/*"
      ]
    }
  }
}
```

```
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  },

  "assets": {
    "application.js": {
      "files": [
        "vendor/jquery.js",
        "assets/javascripts/*"
      ]
    }
  }
}
```

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  "version": "1.2.1",
  "description": "My Website with a blog and a shop",
  "thumbnail": "images/website-logo.png",

  "apps": {
    "/blog": "apps/blog.js",
    "/shop": "apps/shop.js"
  },

  "assets": {
    "application.js": {
      "files": [
        "vendor/jquery.js",
        "assets/javascripts/*"
      ]
    }
  }
}
```

More

- Define a **setup** and **teardown** function to create and delete collections
- Define **lib** to set a base path for your require statements
- Define **files** to deliver binary data unaltered

Documentation as a first class citizen

Annotate your Routes

- For Documentation
- But will later also be used for validation etc.

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app.get("/users/:id", function(req, res) {
  res.set("Content-Type", "text/plain");
  res.body = "Your Wiese: " + req.params("id");
});

app.start(applicationContext);
```
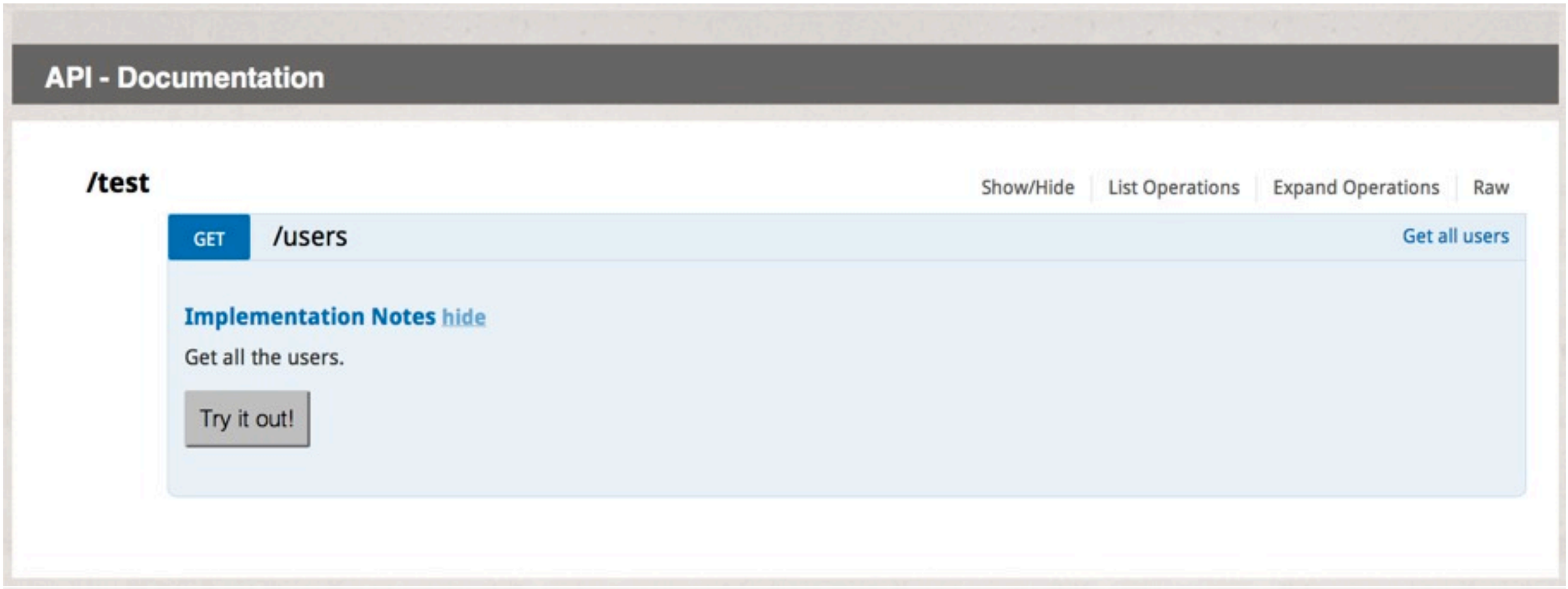

```
app.get("/users/:id", function(req, res) {
  res.set("Content-Type", "text/plain");
  res.body = "Your User: " + req.params("id");
}).pathParam("id", {
    description: "ID of the User",
    dataType: "int"
});
```

Automatically generate Swagger Docs



Simple Demo

In the first part

- The motivation behind ArangoDB Foxx
- Foxx.Application and Manifests
- Documentation

Foxx:

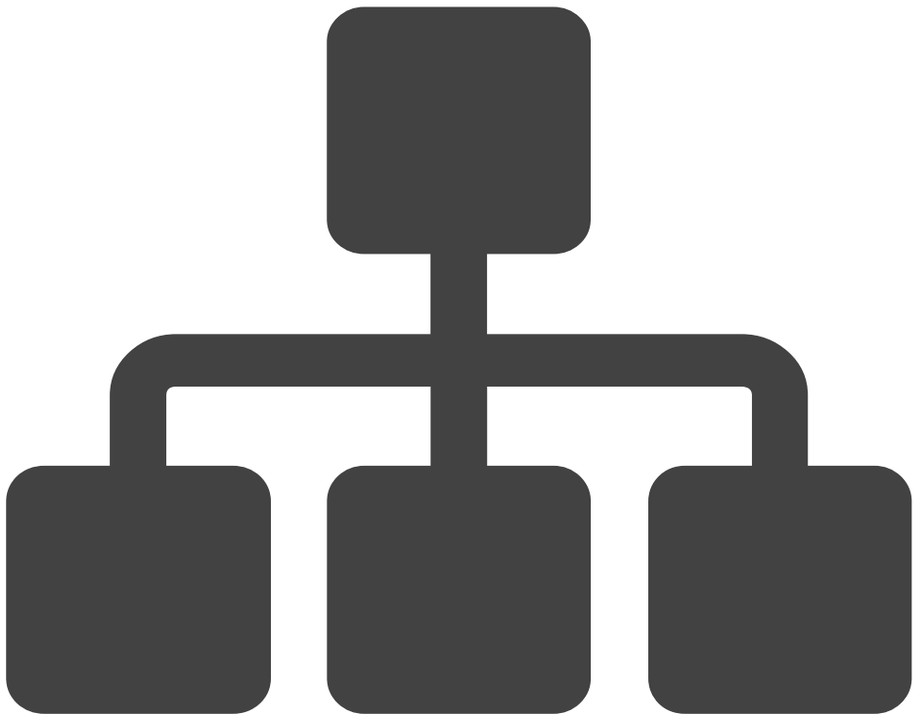
Repository and Model

“

Good design is about
drawing lines

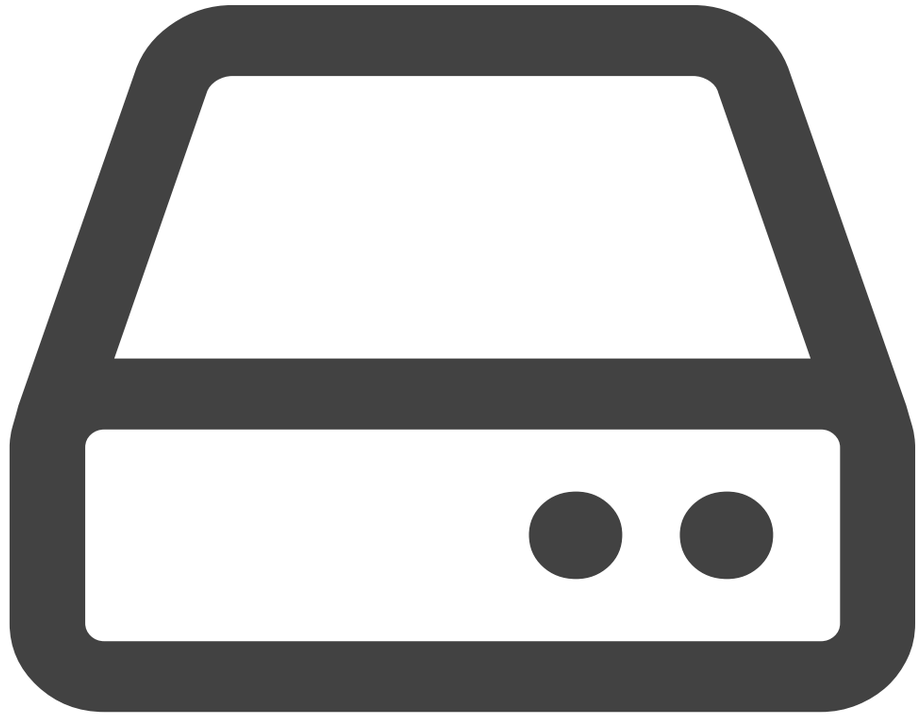
Uncle Bob in
Architecture the Lost Years (Ruby Midwest 2011)

Domain Models



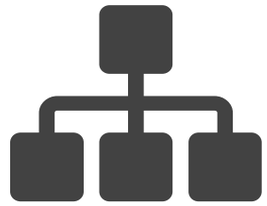
Foxx.Model

Persistence



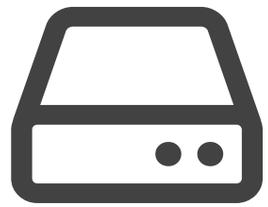
Foxx.Repository

Foxx.Model



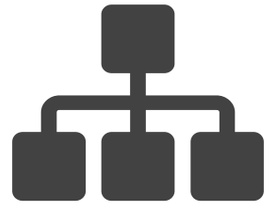
- Representation of the data
- Convenience Methods
- Validation

Foxx.Repository



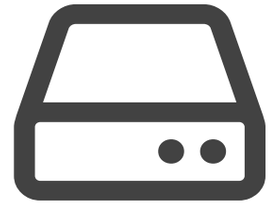
- Save and Retrieve Data
- Simple Queries
- Define your own queries

Foxx.Model



- The **constructor** takes a hash of attributes
- Access the attributes with **get**, **set** and **has**
- The **toJSON** will be used to write the data into the database

Foxx.Repository



- The **constructor** takes a **collection** and the **prototype of the model**
- **save** for example expects an instance of the model
- **firstExample** finds a suitable dataset and returns it as an instance of the model
- Other methods: **remove**, **replace**, **update**…

You need more?

- Use **Foxx.Repository.extend** and **Foxx.Model.extend** to inherit from the prototype
- Add your own methods
- Your extensions live in separate files

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

MyRepository = Foxx.Repository.extend({
});

exports.Repository = MyRepository;
```

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

MyRepository = Foxx.Repository.extend({
  byName: function (name) {
    return this.byExample({
      name: name
    });
  }
});

exports.Repository = MyRepository;
```

```
FoxxApplication = require("org/arangodb/foxx").Application;

app = new FoxxApplication();

app.get("/foxx/:name", function (req, res) {
});
```

```
FoxxApplication = require("org/arangodb/foxx").Application;

app = new FoxxApplication();

app.registerRepository("fancyCollection", {
  model: "models/my_model",
  repository: "repositories/my_repository"
});

app.get("/foxx/:name", function (req, res) {
});
```

```
FoxxApplication = require("org/arangodb/foxx").Application;

app = new FoxxApplication();

app.registerRepository("fancyCollection", {
  model: "models/my_model",
  repository: "repositories/my_repository"
});

app.get("/foxx/:name", function (req, res) {
  var name = req.params("name"),
    item = repositories.fancyCollection.byName(name);
});
```

```
FoxxApplication = require("org/arangodb/foxx").Application;

app = new FoxxApplication();

app.registerRepository("fancyCollection", {
  model: "models/my_model",
  repository: "repositories/my_repository"
});

app.get("/foxx/:name", function (req, res) {
  var name = req.params("name"),
    item = repositories.fancyCollection.byName(name);
  res.json(item.toJSON());
});
```

Why this separation?

- It doesn‘t violate the SRP like ActiveRecord
- In a lot of cases you can use the standard Repository or Model and don‘t need your own
- It‘s great for testing
  - You can mock the collection and the model prototype to test your Repository
  - You don‘t need to mock anything to test your model

Foxx:

The Ecosystem

Aal, Aas and a bowl of fish

- Look at demo applications
- Install components from a central repository
- Share your ideas

Foxx Demo App: Aye-Aye

Foxx:

The Future

A Glance into the Future

- Authentication
- Configure filters for your assets:
    - Coffee, Sass, UglifyJS2, Client Templates…
- Models will generate JSON Schemata
- Later: Generators, Caching, Logging, Testing…

Thanks

- Please try ArangoDB Foxx
- We ❤ to get feedback

Contact

- lucas@arangodb.org
- @moonbeamlabs on Twitter

Thanks

- Database icon designed by Romeo Barreto from The Noun Project
- Browser icon designed by Fernando Vasconcelos from The Noun Project
- Logos from Node.js, Ruby on Rails, Django and Symfony from the respective projects
- All other icons are from Font Awesome