

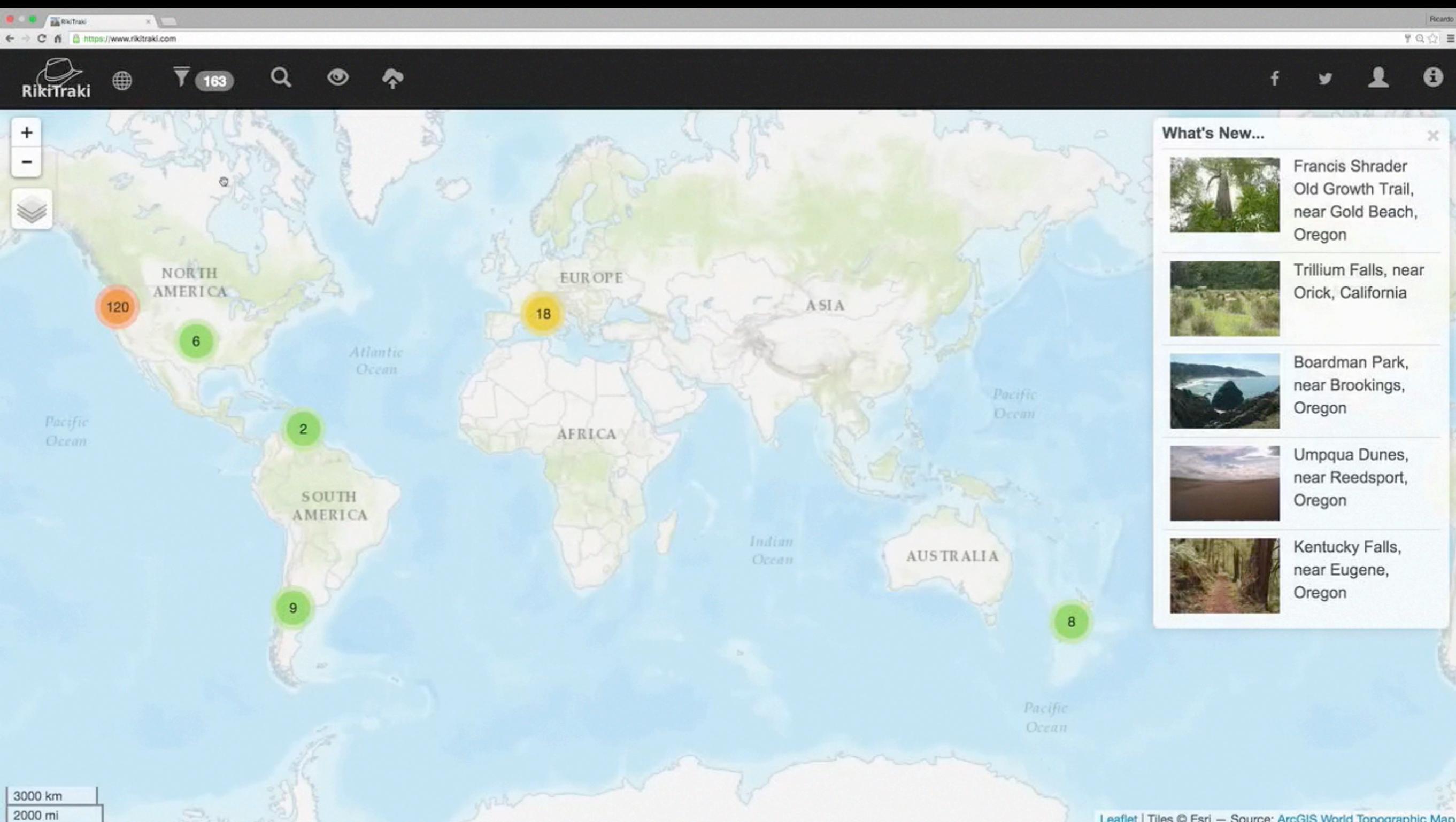


Visualizing GPS tracks with RikiTraki

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FOSS4G NA 2016
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May 3, 2016





[View recorded demo in YouTube](#)

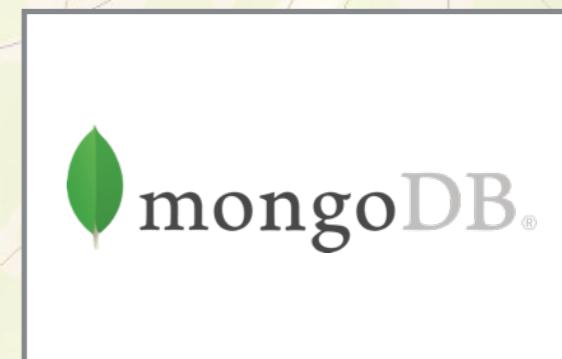
Built on top of a great Open Source foundation...



Single Page Client



Web Services



Database

...with awesome open source components

Leaflet-omnivore	Parsing GPX files
Leaflet.Elevation	Visualizing elevation profiles
Leaflet.markercluster	Visualizing marker groups
Lightbox2	Displaying slide shows
exif-js	Reading exif data
passport	Authentication for nodejs
bcryptjs	Password hashing
jsonwebtoken	JWS token handling
is-my-json-valid	JSON schema validation
javascript-state-machine	Finite state machine µ-framework

It's like having a huge team in your project!

...and open data + free services

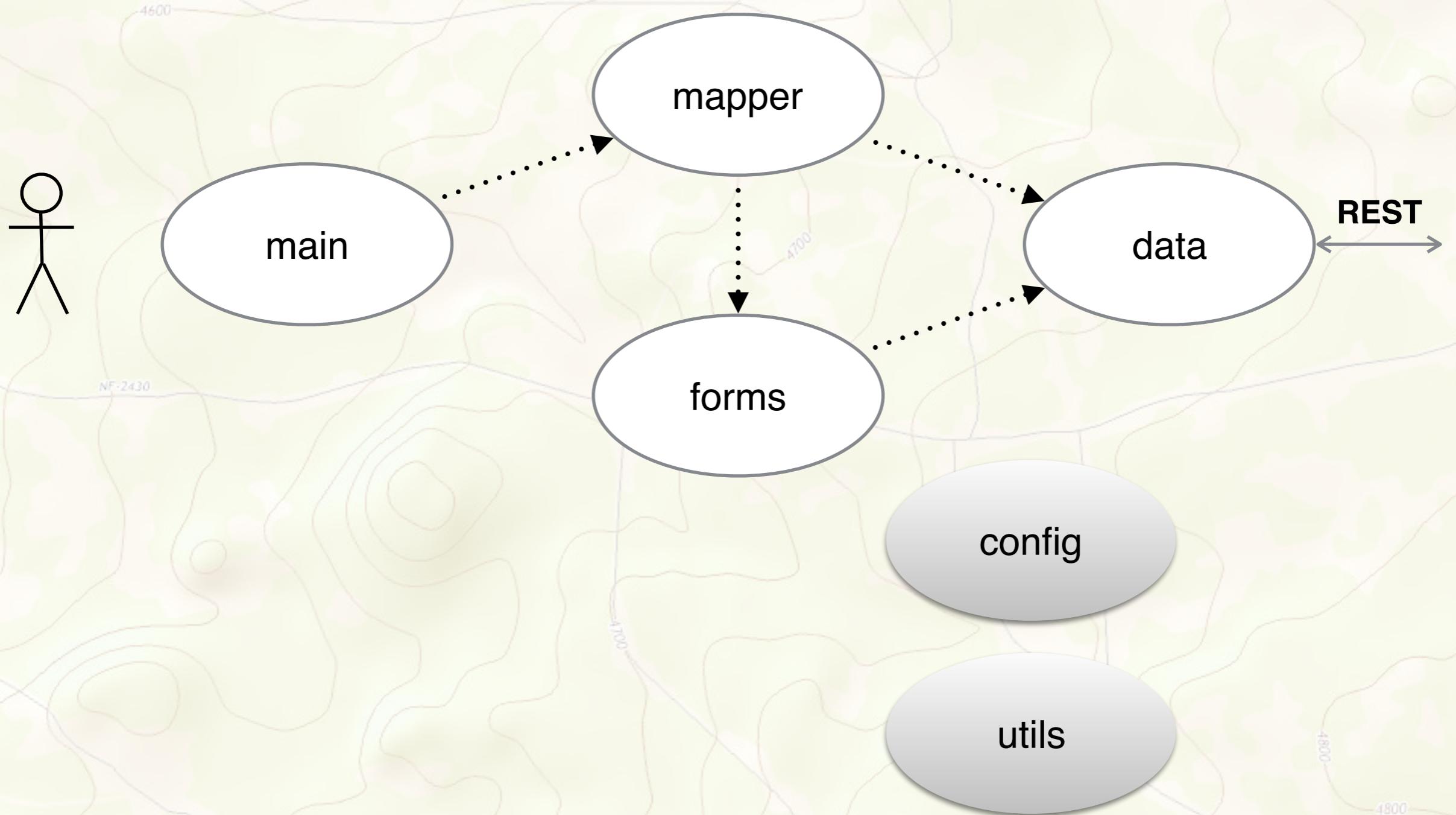


GitHub

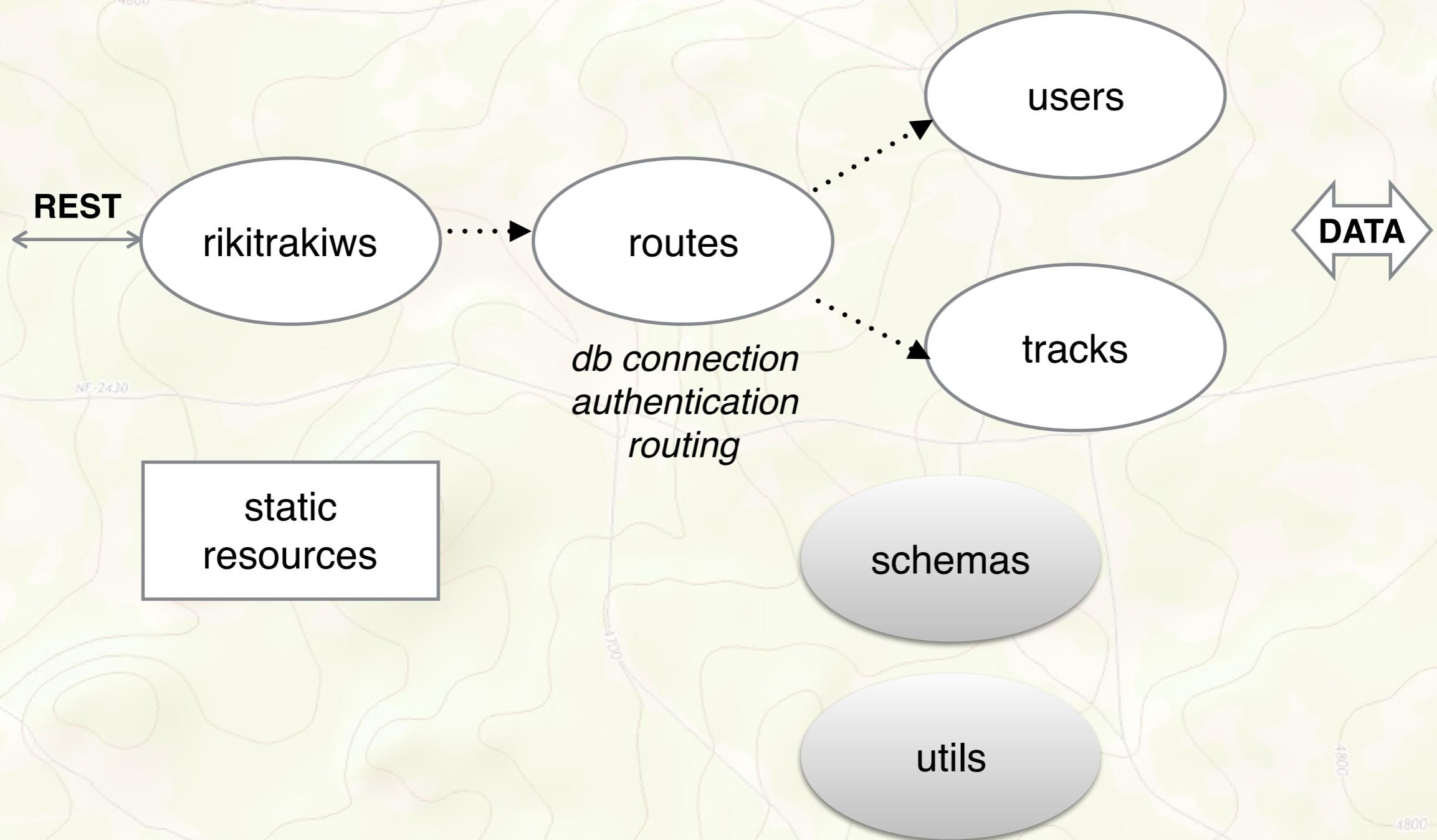


Gratis, zero, zilch, nada!

The client



The web services



Track playback in Cesium using CZML

In function buildCZMLForTrack...

```
var trackCZML = [
  {
    id: 'document',
    name: 'Track CZML',
    version: '1.0',
    clock: {...}
  },
  {
    id: 'track',
    availability: ...,
    path : {...},
    billboard: {...},
    position: {...}
  }
];

```

The time range of the track

The path to draw as time passes

The leading shape of the path

Time + coordinate list

In mapper...

```
viewer.dataSources.add(
  Cesium.CzmlDataSource.load(
    tmUtils.buildCZMLForTrack(
      trackGeoJSON, ...))).then(function(ds){...});
```

On play...

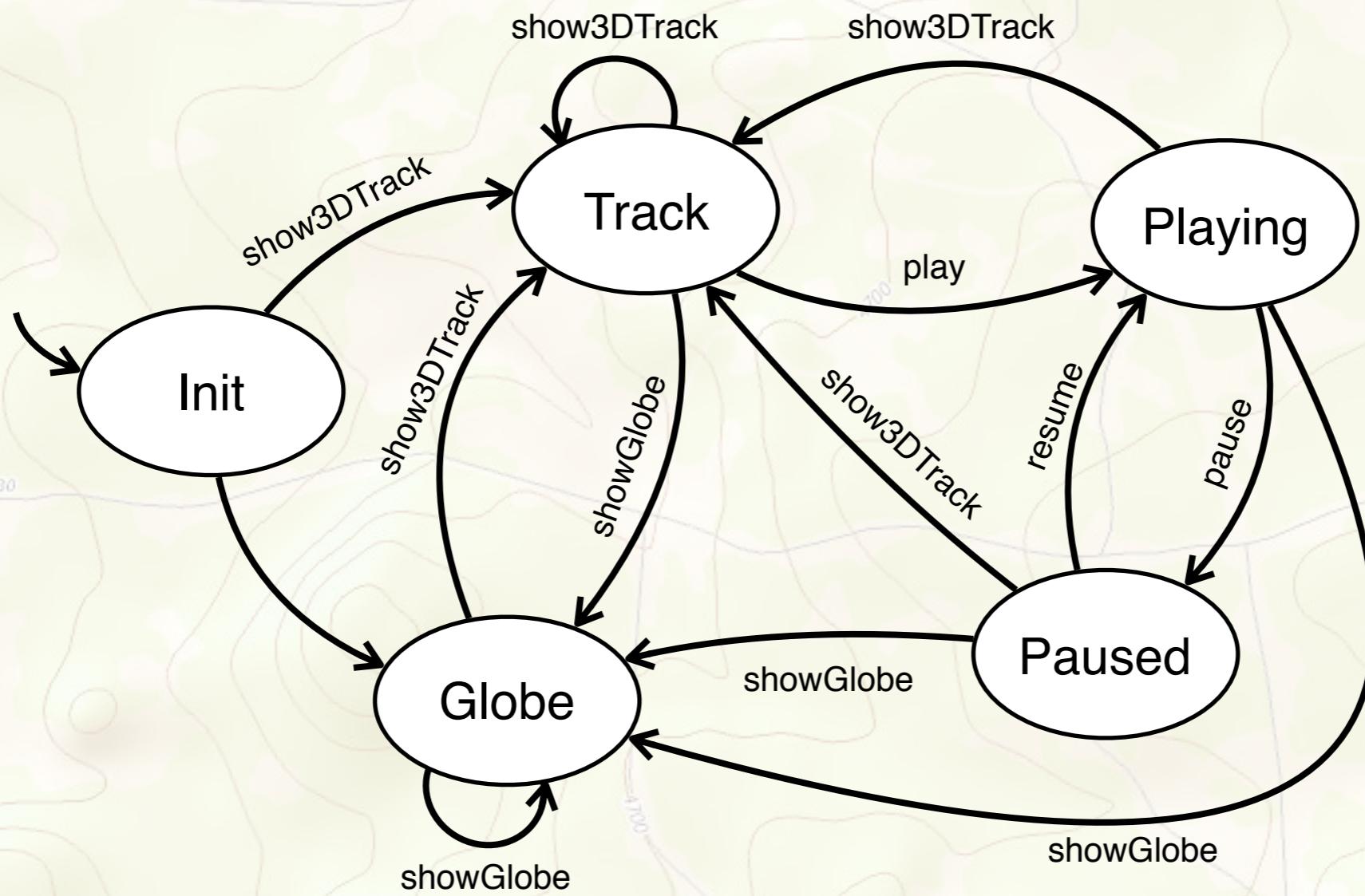
```
viewer.clock.shouldAnimate = true;
```

On pause...

```
viewer.clock.shouldAnimate = false;
```

... voilà, track playback animation!

3D track visualization finite state machine



With javascript-state-machine...

```
fsm3D = StateMachine.create({
  initial: 'Init',
  events: [
    {name: 'show3DTrack', from: ['Init', 'Track', 'Globe', 'Playing', 'Paused'], to: 'Track'},
    {name: 'showGlobe', from: ['Init', 'Globe', 'Track', 'Playing', 'Paused'], to: 'Globe'},
    {name: 'play', from: 'Track', to: 'Playing'},
    {name: 'finishPlay', from: ['Playing', 'Paused'], to: 'Track'},
    {name: 'pause', from: 'Playing', to: 'Paused'},
    {name: 'resume', from: 'Paused', to: 'Playing'},
    {name: 'refresh', from: ['Track', 'Playing', 'Paused'], to: 'Track'}
  ],
  callbacks: {
    onbeforeshow3DTrack: goto3DTrack,
    onbeforeshowGlobe: gotoGlobe,
    onbeforeplay: startPlaying,
    onbeforefinishPlay: resetPlay,
    onbeforepause: enterPauseMode,
    onbeforeresume: startPlaying,
    onbeforerefresh: refresh3DTrack
  }
});
...
fsm3D.showGlobe(initialCameraPosition, tracks);
...
function gotoGlobe(event, from, to, initialCameraPosition, tracks, ...) {...}
...
function goto3DTrack(event, from, to, t, tracks, ...) {...}
...
```

Simple but powerful

Decisions, decisions, decisions

- Web mapping libraries
- Libraries vs full frameworks
- Choice of languages
- SQL vs NoSQL
- BLOB storage
- Drivers vs ODM
- Security
- Scaling

Challenges & Lessons

- Developing incrementally
- Consistent look and feel across mapping libraries
- Multi-browser compatibility, especially mobile
- Dealing with stale libraries/projects
- Keeping an eye on performance and scalability

Contributions welcome!

<i>I just want to see the tracks</i>	Just go to rikitraki.com
<i>I want to save and share my own GPS tracks</i>	Register at rikitraki.com
<i>I want the author to fix bugs</i>	Create issues on Github: <u>https://github.com/jimmyangel/rikitraki/issues</u>
<i>I want the author to consider and work on new features</i>	Comment on the blog: <u>https://www.rikitraki.com/</u>
<i>I want to create my own and contribute code</i>	Fork & PR repos: <u>https://github.com/jimmyangel/rikitraki</u> <u>https://github.com/jimmyangel/rikitrakiws</u>

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RikiTraki



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2D



Thank you!

