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full contact details on last slide

SeMI Collaborative Knowledge Network

Saturday 2nd February 2019 / FOSDEM

Weaviate - The Decentralized Knowledge Graph

Our Plan for the next 30 minutes

- What is Weaviate?
- What is the Contextionary that powers Weaviate?
- What can you do with weaviate?
- How have we built weaviate?
- Live Demo

What do we get out of it?

- Spark your desire to try it out
- Get Feedback from you

What is Weaviate?

- Contextual
- Decentralized
- Knowledge Graph

github.com/creativesoftwarefdn/weaviate

Introducing the Contextionary

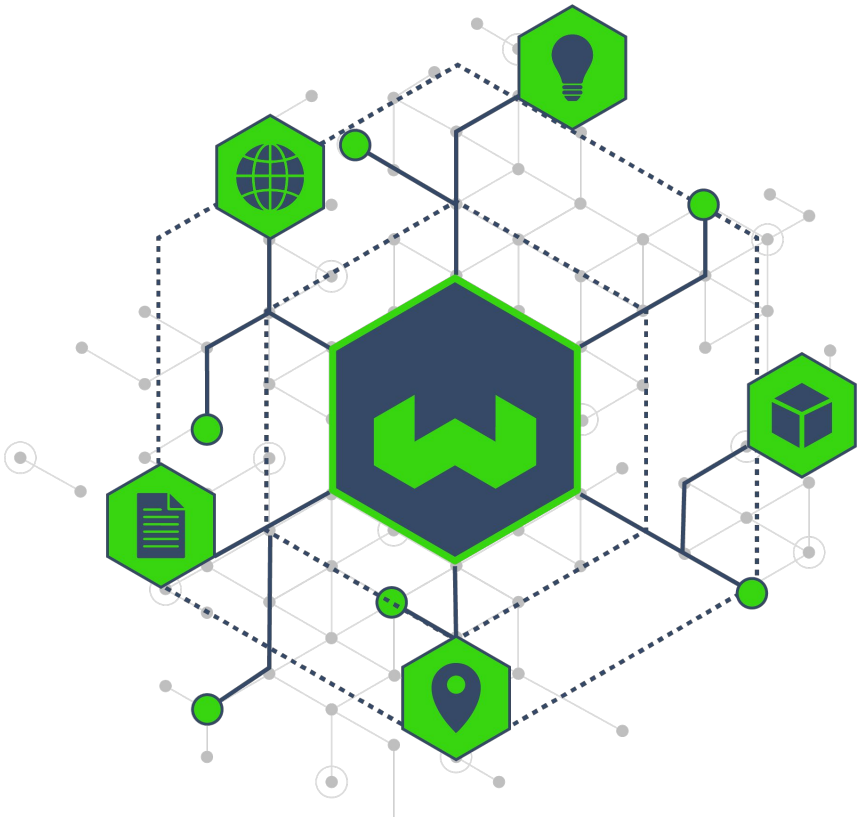
Contextionary: Other Examples

location vs. place vs. city

seal vs. seal

Decentralized

- Standalone
- Peer-to-peer network
  - own your data
  - enrich with other data
- Connect weaviates to combine their strengths (e.g. a fast dataset with a large dataset)



Knowledge Graph

- structured way to ask questions and receive answers (as you know from Google)
- building on existing graph technologies: Graph Databases, GraphQL
- adding more and more semantic tools to our infrastructure over time

What can weaviate be used for?

- Combine data across Industries without harmonizing ontologies
- Easily gain more insights into data you already own
- Enrich your data with publicly known, but previously inaccessible data
  - Find new customers
  - Fraud detection and other behavioral analyses

Example Queries

```
{
  Network {
    Fetch {
      Things(where: {
        class: [{
          name: "Plane",
          certainty: 0.8
        }],
        properties: [{
          name: "model",
          certainty: 0.8,
          operator: Equal,
          valueString: "777"
        }]
      }) {
        beacon
        certainty
      }
    }
  }
}
```

```
class: [{
  name: "Plane",
  certainty: 0.8
   keywords: [{
    value: "Airline",
    weight: 0.9
  },{
    value: "Airport",
    weight: 0.9
  }],
```

How is weaviate different from existing Graph Technology?

Weaviate does not replace, but enhance existing graph technologies.

Example: Should I use weaviate or a graph database directly? How do they differ?

- Ease of use (GraphQL vs. SQL/Gremlin/Cipher etc.)
- NLP and Contextionary
- Modularity of Datastore (CAP-Theorem, pick what you need)
  - Janusgraph, Neo4j, RedisGraph, ...

Architecture - what is weaviate made of

- User-facing APIs : REST and GraphQL
- Microservice
  - small concern, 12-factor, docker and kubernetes native
- Written in Golang 1.11 (yeah, modules!)
  - proven to be a very good language in the cloud environment
  - great compromise between stability, ease of use and cloud performance
  - API design first -> go-swagger
- Focus on Modularity & Pluggability
  - Examples next slides

Focus on Modularity
Example: Database Connector

- Anything that implements a DatabaseConnector interface is a database connector
- The remainder of the app is database-agnostic
- First connector we have built: Janusgraph (with C* and ES)
- Get started with FooBar connector

```
// LocalGetClass resolves a GraphQL request about a single Class like so
//
//      `{ Local { Get { Things { City { population } } } } }`
//
// Where "City" is the particular className of kind "Thing". In the example
// above the user asked to resolve one property named "population". This
// information is contained in the Params, together with pagination and filter
// information.  Based on this info, the foobar connector can resolve the
// request.  It should resolve to a []map[string]interface{} that can be consumed
// by the respective resolver in graphqlapi/local/get.
//
// An example matching the return value to the query above could look like:
//
//      []interface{}{
//       map[string]interface {}{
//        "population": 1800000,
//       },
//       map[string]interface {}{
//        "population": 600000,
//       },
//      }
func (f *Foobar) LocalGetClass(info *get.Params) (interface{}, error) {
        return nil, nil
}
```

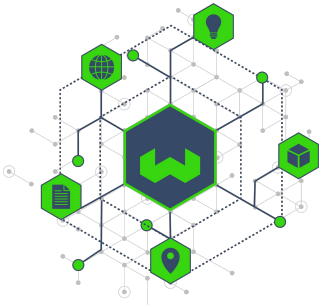
https://github.com/creativesoftwarefdn/weaviate/blob/999fca94146dfba44803c3f862e3a25951a100dc/database/connectors/foobar/connector.go#L356-L379

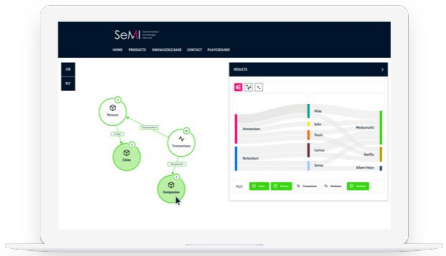
Focus on Modularity
Example: Authentication and Authorization

- Inspired by K8s
  - good separation between AuthN and AuthZ
- AuthN highly pluggable
  - Basic Auth
  - OpenID Connect
  - … let's see what our users use
  - anything that can decided between authenticated "yes/no" and provide a username and/or group to the AuthZ plugin
- AuthZ
  - Role-based Access
  - `(e.g. ["read", "write"] on ["Things", "*"])`
- full proposal available at https://github.com/creativesoftwarefdn/weaviate/issues/628

Who's behind weaviate and what do they offer?

- Enterprise support / Consulting
- Advanced Networking abilities
- Operate own weaviate with helpful datasets (e.g. Wikipedia-based, SMB directory)
- Custom contextionaries (industry-specific)
- "Playground" user interface





SeMI Collaborative Knowledge Network

Roadmap

Completed

REST API

GraphQL API Local

Network Get/GetMeta

Contextionary

Janusgraph Connector

In Development

Network Fuzzy Requests

AuthN/AuthZ as proposed

In Research

Natural Language Interface on top of GraphQL

Feedback and Contact Info

Feedback areas

General Feedback - How useful can weaviate be to you?

API design - Ease of use vs. Abilities?

Connectors - Abstraction vs. Specific features?

Contact SeMI

semi.network

Reach out to David or Micha

About me

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