

State of the RDF JavaScript Libraries

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EIS and Semantic Web Lab
Final Presentation
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- Work Organization and Team Communication
- Research
 - Survey of RDF JS libraries
 - Analysis Parameters
 - Evaluation and Experiments

- Development
 - Architecture
 - Tools and Technologies
 - Development Environment
 - Testing
- Final Outcome
 - Website with Faceted Search and Filtering
 - Documentation
 - Hosted Solution

Objectives

- Research and comparative analysis of RDF JS libraries
- Based on results obtained, providing an intuitive interface for filtering RDF JS libraries
- Providing easy to use tool for researchers and developers in academics and outside using RDF JS libraries

Organization

- Meetings
 - Weekly team meeting
 - Online communication with Slack
 - With Mentors on necessity and by email
- Managing code/tasks
 - Github
- Sharing files
 - Google Drive and Slack

Research Plan

- Search for all RDF JS libs
- Study on common RDF JS libs
- Categorize libs
- Find common and necessary features for comparison
- Designing evaluation plan

RDF JS Libs Categories

- Parsing
- SPARQL/Queries
- Storage
- UI and Binding

Evaluation Plan

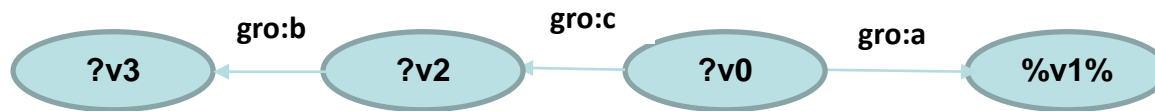
- Find benchmarking method
 - Berlin benchmarking
- Define data set
- Design queries
- Environment

Data Set

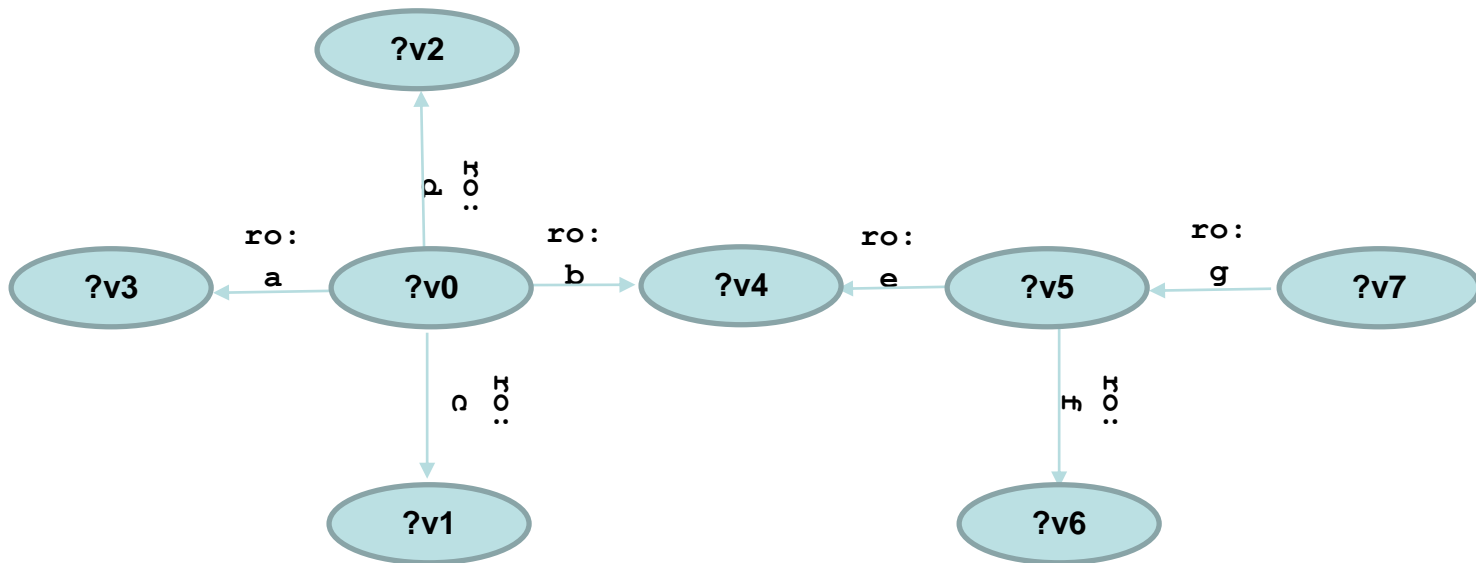
- Reference: Waterloo data set
- Data set size
 - 100000 (100K)
 - 1000000 (1 M)
 - 10000000 (10 M)

Queries

- Linear

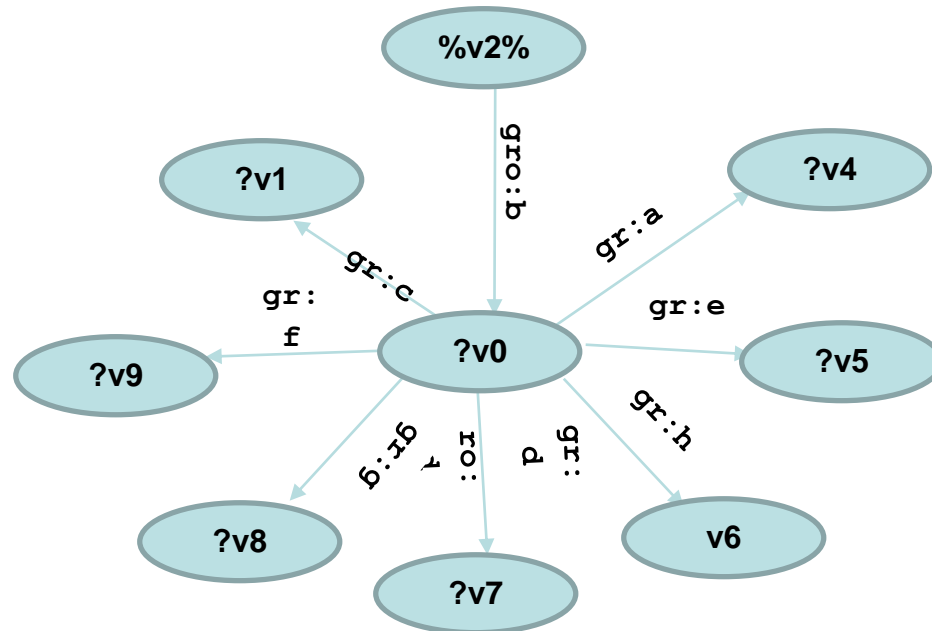


- Complex



Queries (ctd.)

- Snowflake



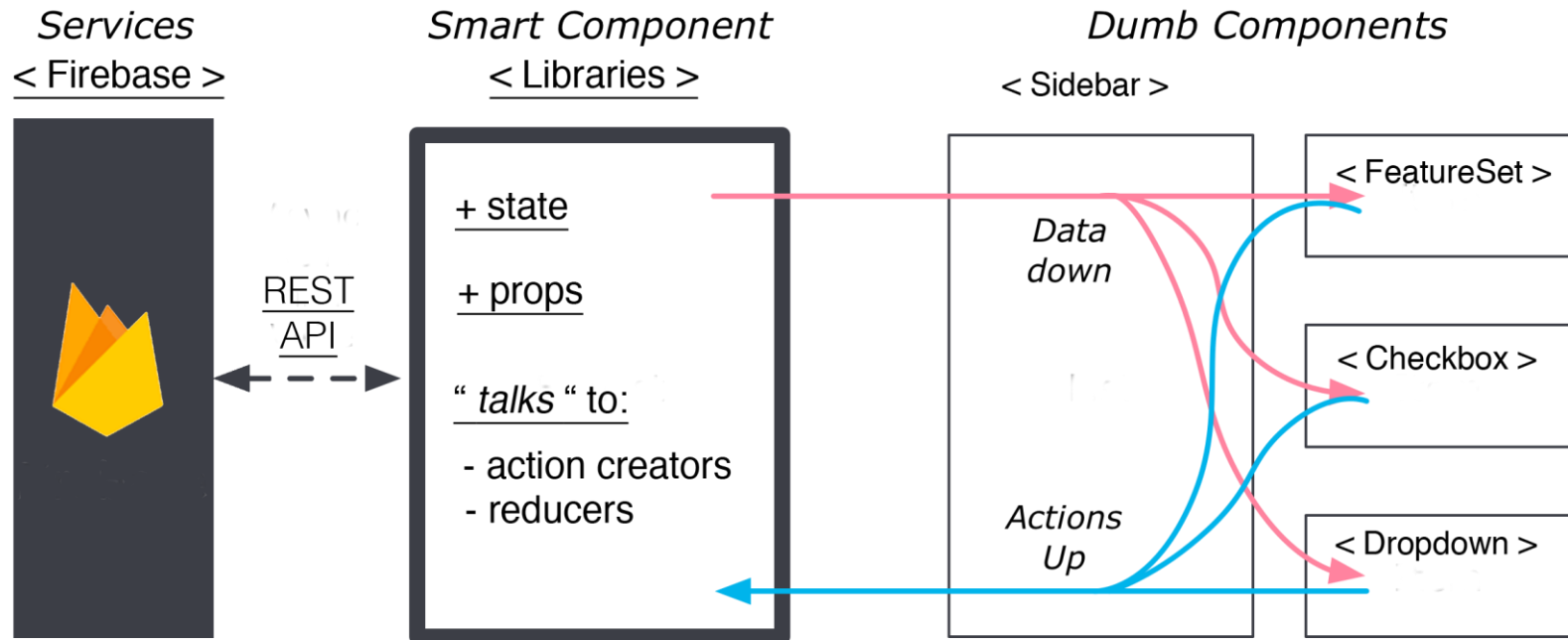


System Configuration	
Mc Book Pro	
Late 2013	
CPU	2GHz Intel core i7
RAM	8GB 1600MHz DDR3
Web Server	Apache

Experiment Results

Library/Query-Data Size	Data Size (100 K)	Linear	Complex	Snowflake
rdflib	1	13.99 s	13.96 s	13.92 s
	10	2.21 min	2.3 min	2.2 min
	100	n/a	n/a	n/a
rdfstore	1	1.36 min	1.75 min	1.74 min
	10	20.07 min	21.46 min	20.69 min
	100	n/a	n/a	n/a

Web App Architecture



Application Components

- Listing
- Filtering
- Experiment and Evaluation

Listing

Provide a list of currently existing RDF JS libraries to browse

RDFJS 4 U

Libraries Documentation About

FILTERS

Apply

General Reset

- ☐ Open Source
- ☐ Documentation
- ☐ W3C Certified

ISC ▾

Parsing Reset

Media type ▾

Environment ▾

Interface ▾

SPARQL/Query Reset

All Parsing SPARQL/Query Data Storage UI data binding Experiment results

Name	License	Docs	OSS	Github stars	W3C Cert	Latest Update	Link
node-rdf	Unlicense		✓	54	✓	17-09-2014	Link
sparql-spin-js3	Unlicense		✓	11	✓	14-11-2012	Link
rdfstore-js	MIT	✓	✓	429	✓	27-05-2016	Link
rdfquery	MIT	✓	✓	124	✓	14-07-2009	Link
N3.js	MIT		✓	227	✓	18-09-2015	Link
SPARQL.js	MIT		✓	99	✓	26-01-2016	Link
jsonld.js	BSD		✓	554	✓	25-04-2016	Link
green-turtle	BSD		✓	32	✓	01-11-2014	Link
RDF-Ext	MIT		✓	0	✓	17-03-2015	Link
rdflib.js	MIT	✓	✓	169	✓	11-05-2016	Link
LevelGraph	MIT		✓	704	✓	18-06-2016	Link
Backbone Linked	MIT	✓	✓	7	✓	11-10-2013	Link
SemanticKO	MIT		✓	29	✓	06-02-2012	Link

Filtering

Apply defined filter options and refresh the lib list

The screenshot shows the RDFJS 4 U web application. On the left, there is a 'FILTERS' sidebar with an 'Apply' button (indicated by a mouse cursor) and sections for 'General' (Open Source, Documentation, W3C Certified, License) and 'Parsing' (Media type, Environment, Interface). Below these is the 'SPARQL/Query' section, which is highlighted with a red box and contains a 'Reset' button (indicated by a red arrow) and a 'SPARQL 1.1' dropdown. The main content area is titled 'Comparison of RDF JavaScript libraries' and features a table with columns: Name, Filtering, Language, Latest Update, Size, and Link. The table lists 'rdfstore-js' with custom filter functions and SPARQL 1.0/1.1 support. The top navigation bar includes 'Libraries', 'Documentation', and 'About' links.

Name	Filtering	Language	Latest Update	Size	Link
rdfstore-js	Custom Filter functions	SPARQL 1.0, SPARQL 1.1	27-05-2016	2 KB	Link

Display the results of libraries' evaluation with defined features

RDFS 4 U Libraries Documentation About

Language ▾

Data storage Reset

MongoDB ▾

Indexing ▾

UI data binding Reset

Integration ▾

Bindings ▾

Experiment results Reset

Query Type ▾

Dataset Size ▾

All	Parsing	SPARQL/Query	Data Storage	UI data binding	Experiment results	
Name	Query Type	Dataset Size	Result	Link		
rdflib.js	Complex	100 k	13.96 s	Link		
rdflib.js	Complex	1 m	2.21 min	Link		
rdflib.js	Linear	100 k	13.99 s	Link		
rdflib.js	Linear	1 m	2.30 min	Link		
rdflib.js	Snowflake	100 k	13.93 s	Link		
rdflib.js	Snowflake	1 m	2.20 min	Link		
rdfstore.js	Complex	100 k	1.75 min	Link		
rdfstore.js	Complex	1 m	21.46 min	Link		
rdfstore.js	Linear	100 k	96.32 s	Link		
rdfstore.js	Linear	1 m	20.07 min	Link		
rdfstore.js	Snowflake	100 k	1.74 min	Link		
rdfstore.js	Snowflake	1 m	20.69 min	Link		

<https://bxwks.github.io/RDFS4U/#>

User manual appended to Web App

RDFJS 4 U Libraries Documentation About

Documentation

User Manual

This guide would demonstrate how to:

1. Browse general information about libraries.
2. Browse different categories.
3. Browse experiment results.
4. Select and apply filters.

1. Browse general information about libraries

Select the "All" tab from the tabs list.
You can see general information about all studied JS libraries. This information contains:

- License type
- Available Documentation (Docs)
- Open source status (OSS)
- Github Stars
- W3C Certification (W3C Cert)
- Latest Update
- Library Link

Library	License	Docs	OSS	GitHub stars	W3C Cert	Latest Update	Link
node-rt	Unlicense	✓	✓	54	✓	17-08-2014	Link
spreadjs-approach	Unlicense	✓	✓	11	✓	14-11-2012	Link
offense.js	MIT	✓	✓	479	✓	27-05-2016	Link
officery	MIT	✓	✓	124	✓	14-07-2009	Link
W3.js	MIT	✓	✓	217	✓	18-08-2016	Link
SPARQL.js	MIT	✓	✓	86	✓	29-01-2016	Link
protify.js	BSD	✓	✓	854	✓	29-04-2016	Link
green-turtle	BSD	✓	✓	81	✓	01-11-2014	Link
RDF.js	MIT	✓	✓	0	✓	17-03-2015	Link
off.js	MIT	✓	✓	169	✓	11-05-2016	Link
LeafletGraph	MIT	✓	✓	704	✓	18-08-2016	Link
Backbone Linked	MIT	✓	✓	7	✓	11-10-2013	Link
SemanticJS	MIT	✓	✓	28	✓	04-02-2012	Link

Testing

- Unit testing
 - Covers single component related tasks
- Continuous Integration

Testing (ctd.)

- Method: White box testing
- Tools:
 - Enzyme + Mocha

```
describe("(Component) Checkbox", function() {  
  
  const props = {  
    value: false,  
    title: 'new title'  
  };  
  
  it('renders without exploding', () => {  
    const wrapper = shallow(<Checkbox {...props} />);  
  
    expect(wrapper).to.have.length(1);  
  });  
  
  it('renders with a title', () => {  
    const wrapper = mount(<Checkbox {...props} />);  
  
    expect(wrapper.props().title).to.equal('new title');  
  });  
  
  it('simulates click events', () => {  
    const spy = sinon.spy();  
    const wrapper = shallow(<Checkbox {...props} onChange={spy} />);  
  
    wrapper.find('input').simulate('change');  
  
    expect(spy.calledOnce).to.be.true;  
  });  
});
```

References

- "Comparison Of RDFJS Libraries - RDF Javascript Libraries Community Group". *W3.org*. N.p., 2016. Web. 7 Oct. 2016.
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- Bizer, Christian, and Andreas Schultz. "The Berlin SPARQL Benchmark." (2009).
- "Lightning-Fast RDF In Javascript". *Ruben.verborgh.org*, 2013. Web. 7 Oct. 2016.
- "An Introduction And A Javascript RDF/XML Parser | Decentralized Information Group (DIG) Breadcrumbs". *Dig.csail.mit.edu*, 2016. Web. 7 Oct. 2016.
- "Writing A SPARQL Parser In Javascript". *Ruben.verborgh.org*. N.p., 2014. Web. 7 Oct. 2016.