Elasticsearch

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History

- Emerged from a desire to make an "open source" search engine
    - Scalable – firehose, data size, parallel search
    - Inverted index – full text
    - Ranking / relevance
    - Recommendation engine
- Built on top of Apache Lucene
    - A "Google" of your own
- Has evolved into NoSQL Applications

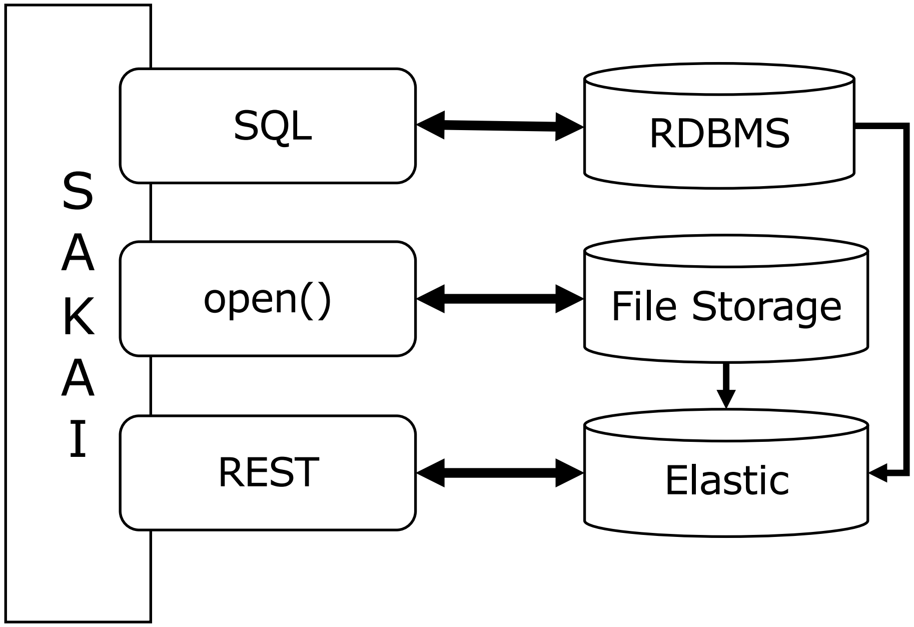
License – Open Core

- The essential parts are free under an Apache license
- The Elastic" company supports open source and sells hosting / consulting / extras but you can use this without paying Elastic

https://github.com/elastic/elasticsearch/blob/master/LICENSE.txt
https://www.elastic.co/products/elasticsearch
https://en.wikipedia.org/wiki/Open-core_model

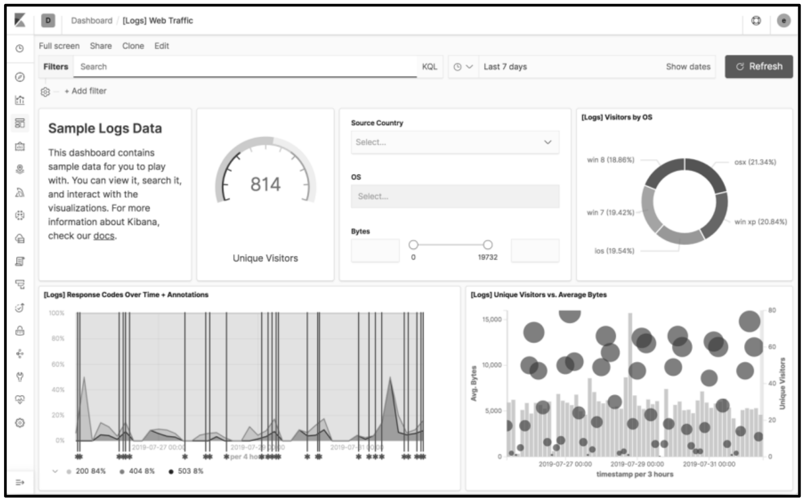
Application: Sakai

- Open Source Learning Management System



Application: ELK Stack

- Elasticsearch – distributed NoSQL database
- Logstash – ingests streams of activity data
- Kibana – Visualization / Dashboards

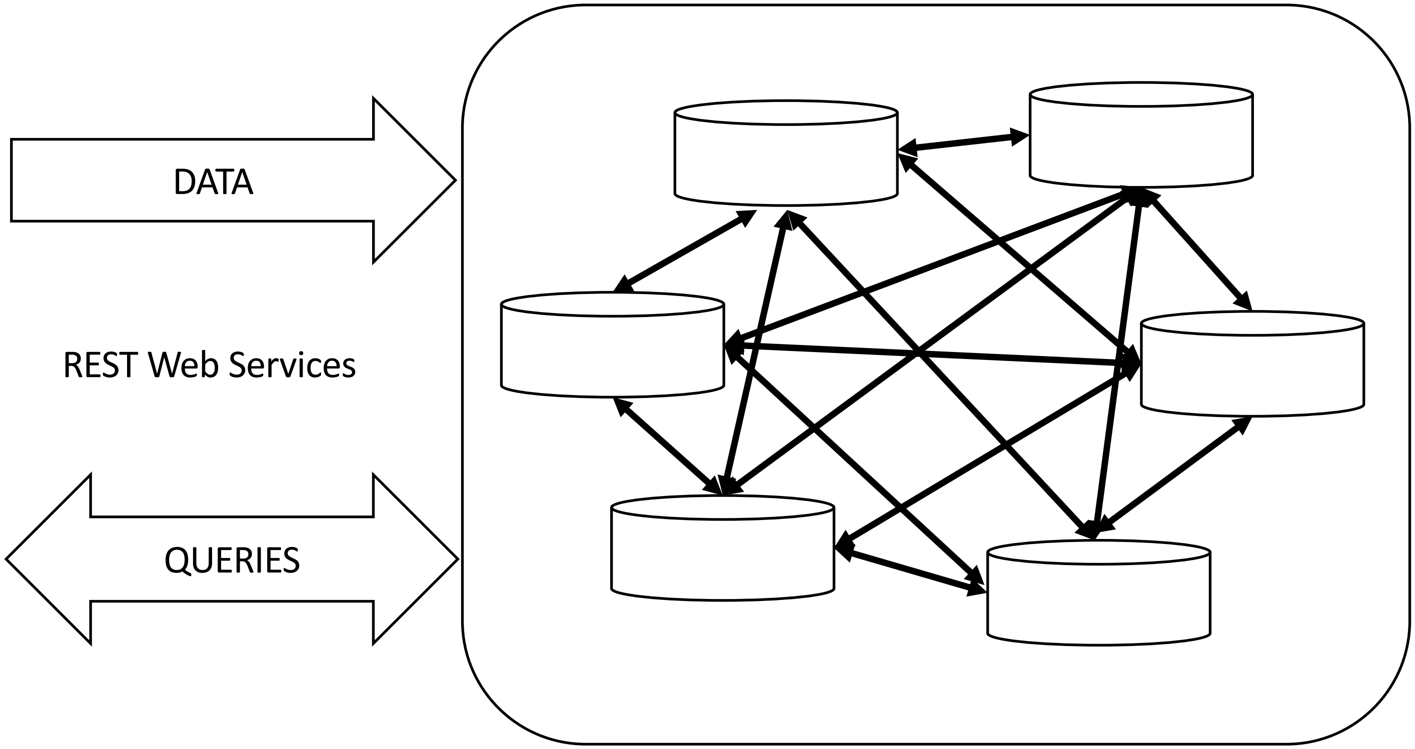


Sample Logs Data

This dashboard contains sample data for you to play with. You can view it, search it, and interact with the visualizations. For more information about Kibana, check our docs.

https://www.elastic.co/guide/en/kibana/current/dashboard.html

Architecture

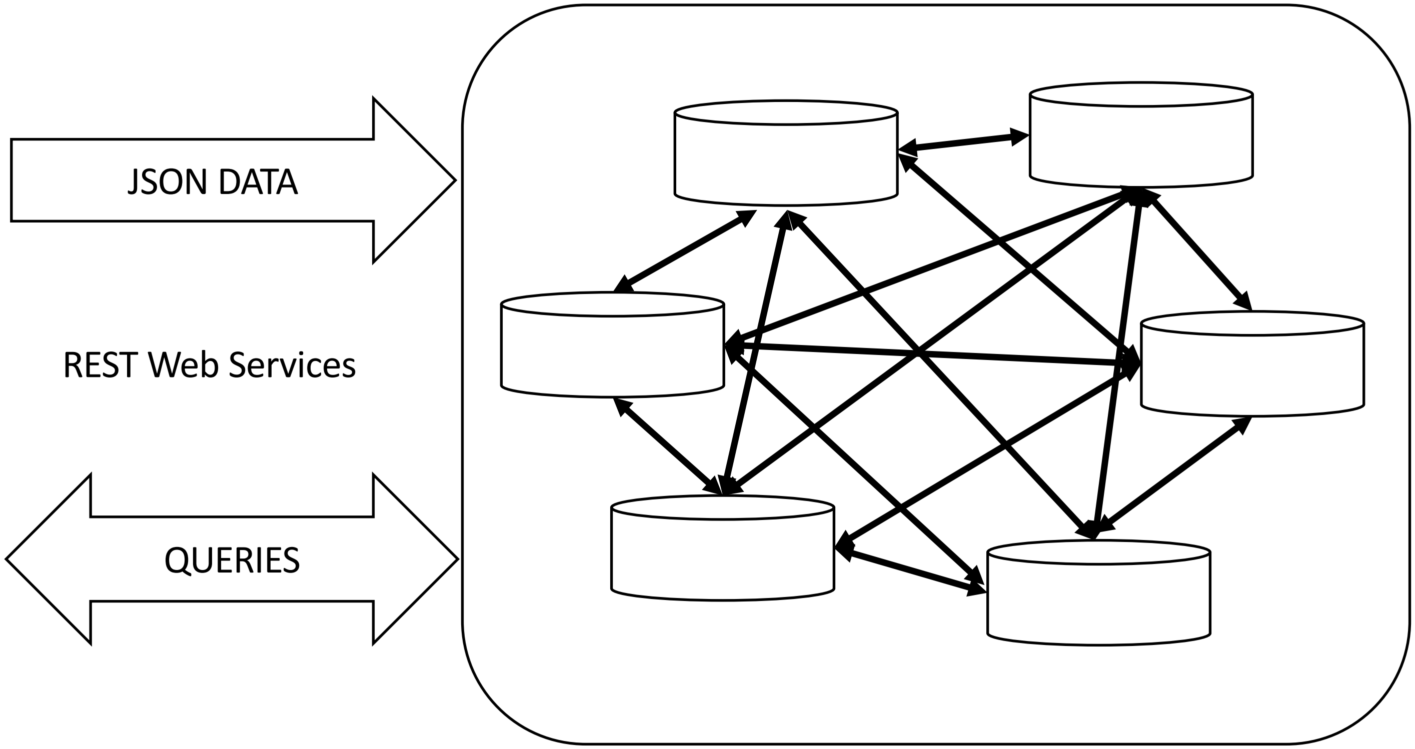


DATA

REST Web Services

QUERIES

Architecture – Eventual Consistency

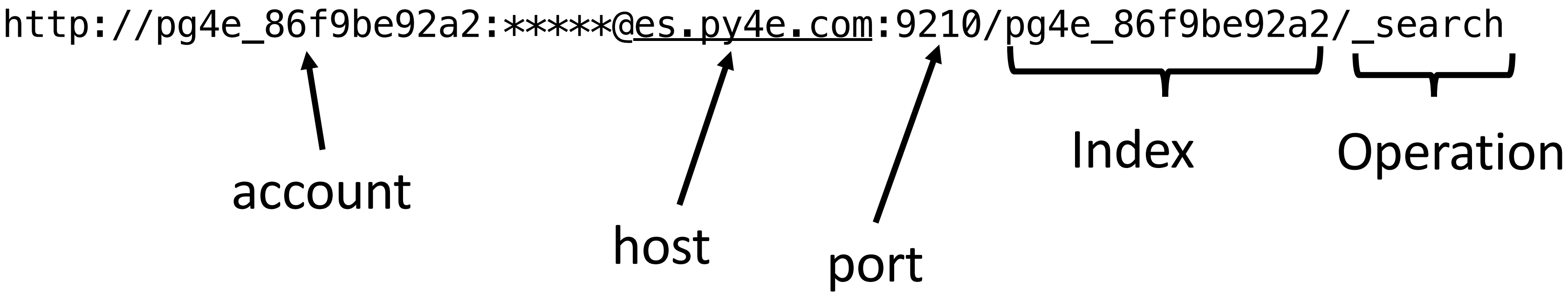


JSON DATA

REST Web Services

QUERIES

Document Storage URLs



```
http://pg4e_86f9be92a2:*****@es.py4e.com:9210/pg4e_86f9be92a2/_search
```

account

host

port

Index

Operation

Programming Elasticsearch

Reading docs - REST APIs

Match all query

The most simple query, which matches all documents, giving them all a _score of 1.0.

```
GET /_search
{
    "query": {
        "match_all": {}
    }
}
```

https://www.elastic.co/guide/en/elasticsearch/reference/current/query-dsl-match-all-query.html

In Python…

```
queryurl = http://pg4e_86f9:*@es.py4e.com:9210/prefx/testindex/_search?pretty'

body=json.dumps( {"query": {"match_all": {}}} )
hdict = {'Content-type': 'application/json; charset=UTF-8'}

response = requests.post(queryurl, headers=hdict, data=body)

text = response.text
status = response.status_code
js = json.loads(text)
```

https://www.pg4e.com/code/elastictool.py

Python Elasticsearch Library

```
# pip3 install elasticsearch

from elasticsearch import Elasticsearch

es = Elasticsearch(
 [secrets['host']],port=secrets['port'],url_prefix=secrets['prefix'],
 http_auth=(secrets['user'],secrets['pass']),scheme="http",
 )

res = es.search(index="testindex", body={"query": {"match_all": {}}})
print(res)
```

https://elasticsearch-py.readthedocs.io/en/master/
https://www.pg4e.com/code/elastictweet.py

Summary

- Elasticsearch gives us Google-like features
  - Scalable ingest / data size / search performance
  - Accessible through a "REST API"
- Can be used as a full-text "search engine"
- Can be used as a scalable NoSQL database

Acknowledgements / Contributions

Initial Development: Charles R. Severance, University of Michigan School of Information

Insert new Contributors and Translators here including names and dates

Continue new Contributors and Translators here