

Elasticsearch+Kibana/Kibi as QA tools



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02.11.2016

Outline

Presentation of Elasticsearch+Kibana/Kibi as a possible tools for QA analysis.

Plan:

- 1.What are Elasticsearch, Kibana and Kibi?
2. How dose it work: The Example;
3. ES Parent-Child Relationship;
4. Summary.

The tools: What are Elasticsearch, Kibana and Kibi ?



elastic



SIREn
SOLUTIONS

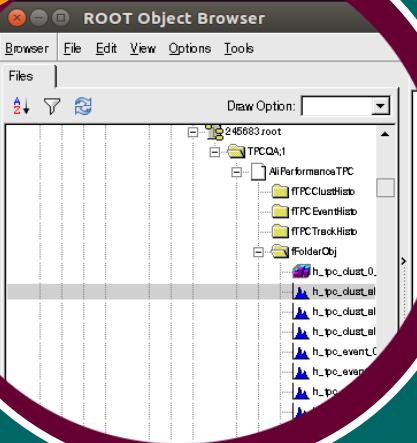
Visualisation:



How dose it work?

1.

File.root



2.

Conversion of the
ROOT data to JSON files.

```
{  
  "mappings": {  
    "run_245692": {  
      "properties": {  
        "run": { "type" : "integer"},  
        "mean": { "type" : "float"},  
        "rms": { "type" : "float"},  
        "alert1": { "type" : "float"},  
        "alert2": { "type" : "float"}  
      }  
    }  
  }  
}
```

data.json

Mapping

3.

Elasticsearch

+

Kibana/Kibi
to visualisation

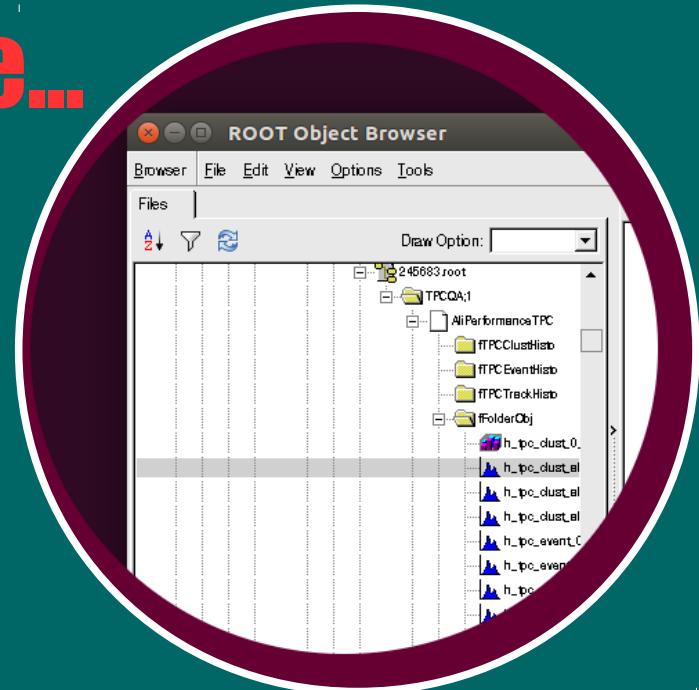
monitoring

QA Alerts!

3

How does it work?: An Example...

- Production: **LHC15o_pass1**;
- Number of runs: **27**;
- ROOT file: **QResults.root**;
- Information → run-by-run trending:
 - **of mean of minimum bias multiplicity distribution;**



ROOT data to JSON files:

```
{  
  "mappings": {  
    "multiplicity": {  
      "properties": {  
        "run": { "type" : "integer"},  
        "mean": { "type" : "float"},  
        "rms": { "type" : "float"},  
        "alert1": { "type" : "float"},  
        "alert2": { "type" : "float"}  
      }  
    }  
  }  
}
```

Mapping

Document

```
{"index": {"_id": "7"}},  
{  
  "run" : "245738",  
  "mean" : "621.000000",  
  "rms" : "604.218933",  
  "alert1" : "948.224304",  
  "alert2" : "964.000549"  
}  
}  
  
_type:multiplicity
```

fields

curl -XPOST 'localhost:9200/_index -d @mapping.json

Explore the data...

KIBANA:<http://YOURDOMAIN.com:5601>

KIBI:<http://YOURDOMAIN.com:5606>

The screenshot shows the Kibi interface with a search results table. A red arrow points from the top left towards the search bar, which contains the text "query bar". The results table has columns for _id, _index, _score, and _source. Several rows are highlighted with colored bubbles: a pink bubble highlights the first row, a green bubble highlights the second row, and another pink bubble highlights the third row. The bottom of the screen shows a smaller version of the same interface.

_id	_index	_score	_source
run: 245,683	mean: 956.486	rms: 1,061.472	alert1: 948.224 alert2: 964.001 _id: 0 _type: multiplicity
run: 245,683	mean: 0.834	rms: 0.109	alert1: 0.828 alert2: 0.849 _id: 0 _type: clusters _index: run_245683 _score: 1
run: 245,829	mean: 957.223	rms: 1,067.627	alert1: 948.224 alert2: 964.001 _id: 14 _type: multiplicity
run: 245,829	mean: 957.223	rms: 1,067.627	alert1: 948.224 alert2: 964.001 _id: 14 _type: multiplicity
run: 245,952	mean: 957.685	rms: 1,072.186	alert1: 948.224 alert2: 964.001 _id: 19 _type: multiplicity

2.

The screenshot shows the Kibi interface with a search results table. A red circle highlights the first row of the table. The results table has columns for _id, _index, _score, and _source. The bottom of the screen shows a smaller version of the same interface.

_id	_index	_score	_source
run: 245,683	mean: 956.486	rms: 1,061.472	alert1: 948.224 alert2: 964.001 _id: 0 _type: multiplicity
run: 245,829	mean: 957.223	rms: 1,067.627	alert1: 948.224 alert2: 964.001 _id: 14 _type: multiplicity
run: 245,952	mean: 957.685	rms: 1,072.186	alert1: 948.224 alert2: 964.001 _id: 19 _type: multiplicity

1.

The screenshot shows the Kibi interface with a "Save Search" dialog open. The dialog has a text input field containing "MULTIP" and a "Save" button. A red circle highlights the "Save" button. The background shows a blurred version of the search results table.

3.

5

Visualization of the data...

The image shows a composite screenshot of the Kibi interface, illustrating the process of creating a new visualization. It consists of three main sections:

- Step 1:** A screenshot of the "Create a new visualization" screen. The "Visualize" tab is selected in the top navigation bar. A green circle with the number "1." is overlaid on the top-left area of the screen. A red arrow points from the "Visualize" tab in the top navigation bar to the "Area chart" option in the list below.
- Step 2:** A screenshot of the "Create a new visualization" screen, specifically the "Step 2" section where users select a search source. The "Visualize" tab is still selected in the top navigation bar. A green circle with the number "2." is overlaid on the top-right area of the screen, covering the "Area chart" and "Data table" options. A large red circle surrounds this entire section.
- Step 3:** A screenshot of the "Select a search source" screen. The "Discover" tab is selected in the top navigation bar. A green circle with the number "3." is overlaid on the bottom-left area of the screen, covering the "From a new search" and "From a saved search" buttons.

Create a new visualization

Discover Visualize Dashboard Settings

Area chart Great for stacked timelines in which the total of all series is more

1.

2.

3.

Select a search source

Discover Visualize Dashboard Settings

From a new search

From a saved search

Saved Search Filter

MULTIP

manage saved searches
1 saved search

Step 2

Discover Visualize Dashboard Settings

Area chart Great for stacked timelines in which the total of all series is more

Data table The data table provides a detailed breakdown, in tabular form, of other charts by clicking grey bar at the bottom of the chart

Enhanced search results Display search results - just like "searches" - but allows easier selections.

Kibi Query Viewer Your SQL/SPARQL queries results here (which can be pasted into the search bar)

Kibi Relational filter Relational widget displays buttons which allow user to select

Kibi Timeline Timeline widget for visualization of events

Kibi Word Cloud Visualize a word cloud from high frequency terms

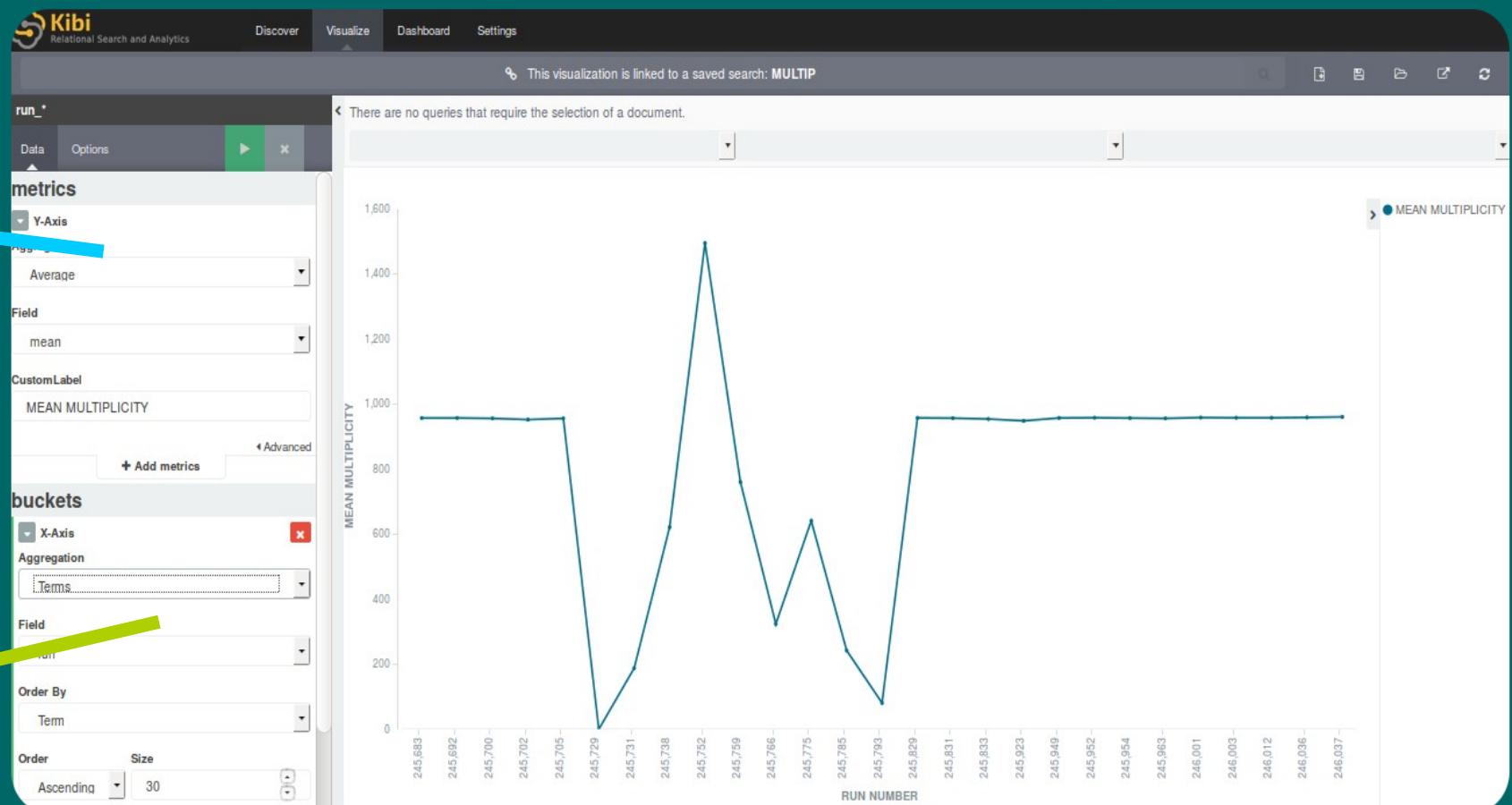
Line chart Often the best chart for high density data points can be misleading.

Step 3

Discover Visualize Dashboard Settings

6

Visualization of the data...

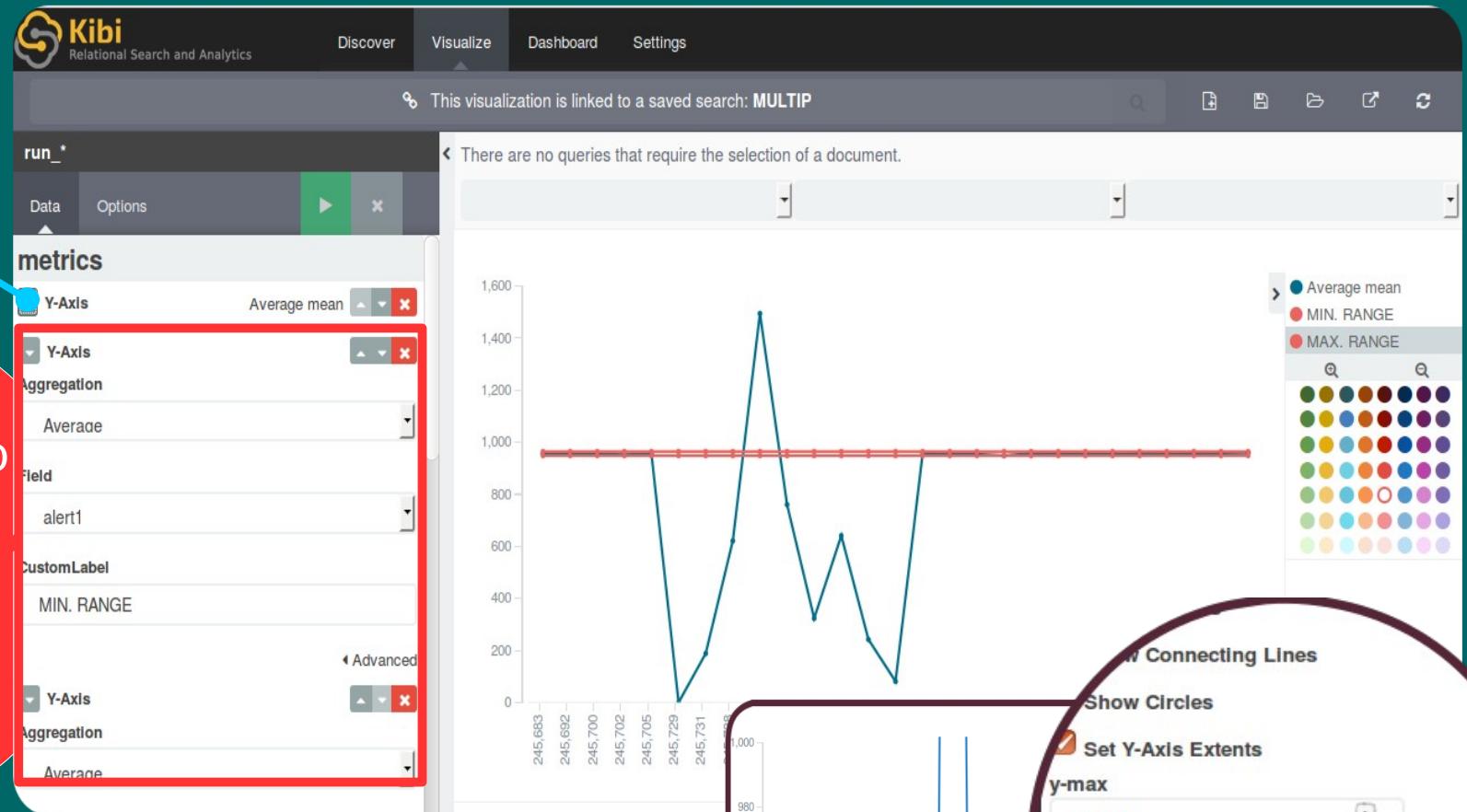


Visualization of the data: Some Alerts!

Y Axis:
mean MB multiplicity.

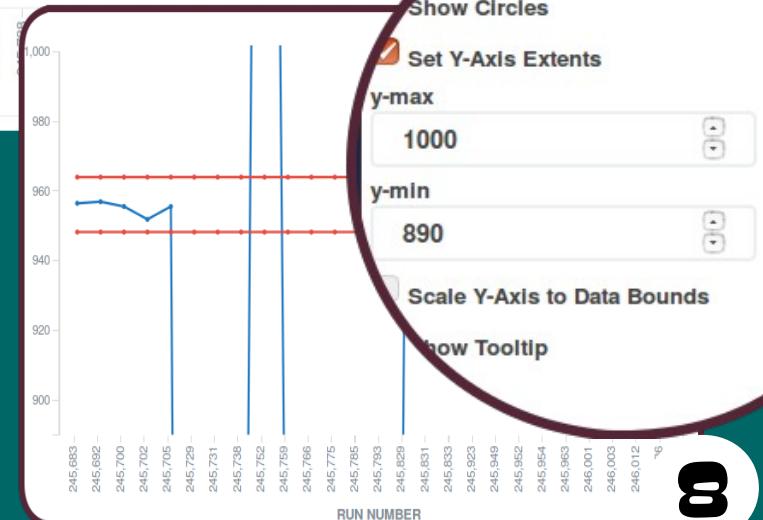
1.

Superimposed two
alerts selection
criteria arbitrary
implemented
in the JSON files.



2.

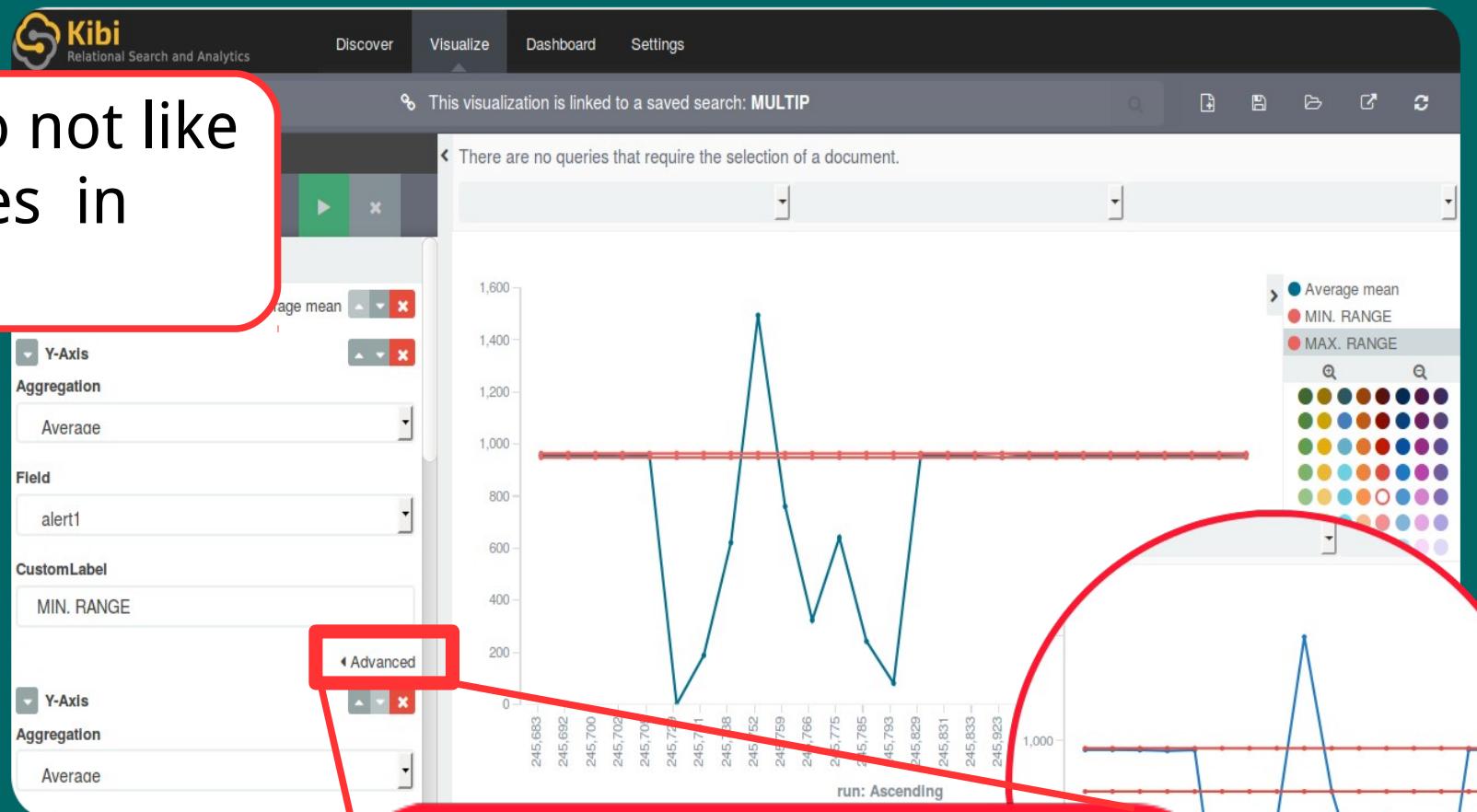
One can easily change
a visualization properties.



Visualization of the data: Some Alerts!

1.

What if one do not like
the alert ranges in
JSON file?!



...they can be easily
changed using **Kibana/Kibi**
script options...

2.

9

Parent-Child Relationship

Consider QA document structure in ES:

Index: production info

Run_1

TPC_QA

TRD_QA

...

Run_2

Run_3

Run_4

multiplicity

clusters

charge

...

CHILD1

PARENT

```
{
  "mappings": {
    "lhc15o_pass1": {
      "properties": {
        "run": { "type" : "integer" }
      }
    },
    "tpc_qa": {
      "_parent": {
        "type": "lhc15o_pass1"
      },
      "properties": {
        "tpc_info1": {"type" : "float"},
        "tpc_info2": {"type" : "integer"}
      }
    },
    "trd_qa": {
      "_parent": {
        "type": "LHC15o_pass1"
      },
      "properties": {
        "trd_info1": {"type" : "float"},
        "trd_info2": {"type" : "float"}
      }
    }
  }
}
```

CHILD2

Parent-Child Relationship

The consider QA document structure in ES:

Index: production info

Run_1

multiplicity

TPC_QA

clusters

TRD_QA

charge

CHILD1

...

Run_2

Run_3

Run_4

```
{  
  "mappings": {  
    "lhc15o_pass1": {  
      "properties": {  
        "run": {  
          "type": "parent"  
        },  
        "tpc_qa": {  
          "_parent": {  
            "type": "parent"  
          },  
          "properties": {  
            "": "float"  
          }  
        }  
      }  
    }  
  }  
}
```

PARENT



Kibana visualization
of parent-child!

CHILD2

```
" : "float"  
" : "float"
```

Summary

1. ES/Kibana/Kibi Pros and Cons:

- ES/Kibana/Kibi: available, open source tools;
- ES fast search engine;
- Kibana/Kibi -"user friendly" visualization tools;

- Kibana- no visualization of correlations between two documents;
- Kibi – correlations available but not in open source :(

2. TO DO: Test ES/Kibana/Kibi to read large data/statistic, we are going to use Logstash.

THAnK YOU!

