LabLua
programming language research

Google Summer of Code 2015

Elastic
Me

Pablo Musa
Educational Engineer @ Elastic
Which student?

- 5 interested students
- 3 very good proposals
- Key Points:
  - Background (Lua, Elasticsearch, Open Source)
  - Availability (how many hours per week)
  - Future (development likelihood after GSoC)
Dhaval Kapil

3rd year computer science student at IIT Roorkee

Mostly self-taught himself by reading books and online articles.

Dhaval Kapil
https://dhavalkapil.com/

Passionate about networking, security and development

Active participant in CTFs. Also, a developer and challenge setter of Backdoor CTF.
(http://backdoor.sdslabs.co/)
Agenda

• Elasticsearch

• Elasticsearch & Lua

• elasticsearch-lua

• WERpapers

• Elastic
Elasticsearch is ...
Elasticsearch is...

an open source, distributed, scalable,
highly available, document-oriented, RESTful
full text search engine
with soft real-time search and analytics capabilities
Elasticsearch is...

an open source, distributed, scalable, highly available, document-oriented, RESTful, full text search engine with real-time search and analytics capabilities

Apache 2.0 License
https://www.apache.org/licenses/LICENSE-2.0
Elasticsearch is...

an open source, **distributed, scalable**, highly available, document-oriented, RESTful, full text search engine with real-time search and analytics capabilities
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Source: http://json.org/

```json
{
    "name" : "Webinar",
    "geo" : {
        "city" : "Amsterdam",
        "lat" : 4.85, "lon" : 52.34
    }
}
```
Elasticsearch is...

an open source, distributed, scalable, highly available, document-oriented, **RESTful**, full text search engine with real-time search and analytics capabilities.

Source: https://httpwg.github.io/asset/http.svg
Elasticsearch is...

an open source, distributed, scalable, highly available, document-oriented, RESTful, **full text search engine** with real-time search and analytics capabilities.
Elasticsearch is...

an open source, distributed, scalable, highly available, document-oriented, RESTful, full text search engine with **real-time search and analytics capabilities**
Getting up and running... is easy

```bash
$ wget https://download.elastic.co/elasticsearch/elasticsearch/elasticsearch-1.7.1.tar.gz
$ tar -zxf elasticsearch-1.7.1.tar.gz
$ cd elasticsearch-1.7.1
$ ./bin/elasticsearch
```

http://localhost:9200
Elasticsearch & Lua
About the Project

• 3-month project

• A "complete" Lua client to access the Elasticsearch REST API

• Influence of official clients

• Respect the student
Elasticsearch Clients Design Principles

"Nobody should have a reason not to use the client"

We have no opinions

Respect the language
Much more than just a "JSON and HTTP wrapper"

- Distributed systems
  - sniffer
  - selector

- Add Features
  - reindex
  - common syntax
High Level Architecture

- **Helper**
- **Client**
- **Transport**
- **Connection Pool**
- **Connection**
- **Parser**
  - `cjson`
  - `lua-yajl`
- **Sniffer**
- **Selector**
  - `RoundRobin`
  - `Random`
  - `...

Other http lib:
- `luasocket`
- Other http lib
elasticsearch-lua
Lua vs JSON

```json
{
  "title" : "A Requirements Elicitation Approach Based in Templates and Patterns",
  "author" : "A. Durán Toro",
  "add_authors" : [ "B. Bernárdez Jiménez", "A. Ruiz Cortés", "M. Toro Bonilla" ],
  "key_words" : [ "requirements engineering", "requirements elicitation" ],
  "language" : "en",
  "conference" : "WER99",
}
```
local paper = {
    title = "A Requirements Elicitation Approach Based in Templates and Patterns",
...
}

local elasticsearch = require"elasticsearch"
local client = elasticsearch.client() -- use default configs
local r, e = client:index({
    index = "papers", type = "wer", id = 1, body = paper
})

local r, e = client:get( { index = "papers", type = "wer", id = 1 } )

local r, e = client:update({
    index = "papers", type = "wer", id = 1, body = { doc = { title = "Updated Title" } } }
)

local r, e = client:delete( { index = "papers", type = "wer", id = 1 } )
Searching

```lua
local r, e = client:search( { index = "papers", type = "wer", q = "requirements" } )

local r, e = client:search( { index = "papers", type = "wer", q = "title:requirements" } )

local r, e =
```
Why Elasticsearch?
Ibero-american community of researchers on Requirements Engineering
• Dedicated site to the WER publications

• Apache + CGI/Lua + **MySQL** + Google Search
Not for full text search

- Slow
- No text analysis
- No scoring
- No auto-completion
- ...

MySQL®
Research Findings on Empirical Evaluation of Requirements...
Formato do arquivo: PDF/Adobe Acrobat
Nelly Condori-Fernandez. 1., Maya Daneva. 2., Klaas Sikkel. 2.
wer.inf.puc-rio.br/WERpapers/artigos/artigos../fernandez.pdf

Metamodeling for Requirements Reuse
Formato do arquivo: PDF/Adobe Acrobat
description make requirements reuse difficult. In this paper we present a meta-model to integrate some different types of semiformal diagrams into a require-
wer.inf.puc-rio.br/wer02/zip/Metamodeling_reuse(6).pdf
Elasticsearch

• Implement your own search result page

• Relevancy based on downloads, title, abstract, etc.

• Auto-complete, Highlighting, Geo, etc.

• Everything in Lua
Elasticsearch is not Alone
• Forums for all products
• Issue tracker
• User groups & Meetups
Community, community, community

- Forums for all products
- Issue tracker
- User groups & Meetups
Community, community, community

- Forums for all products
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Next Steps

+ Use cases

  + Real applications
  
  + Tests

Automate Integration with Elasticsearch

Make it an official client
Thanks for listening! Questions?

Pablo Musa
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References

https://github.com/DhavalKapil/elasticsearch-lua
https://dhavalkapil.com/blogs/Elasticsearch-Lua/
http://lua-users.org/wiki/JsonModules
http://wer.inf.puc-rio.br/WERpapers/