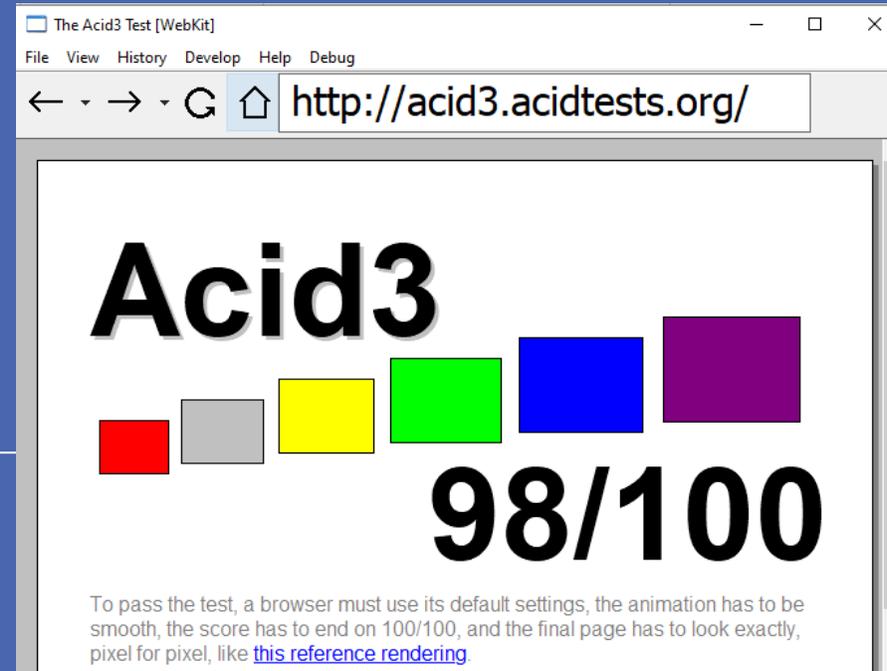


AMAZON ELASTICSEARCH FOR RUBY ON RAILS

By Spencer Peloquin

Curtis Senior High School

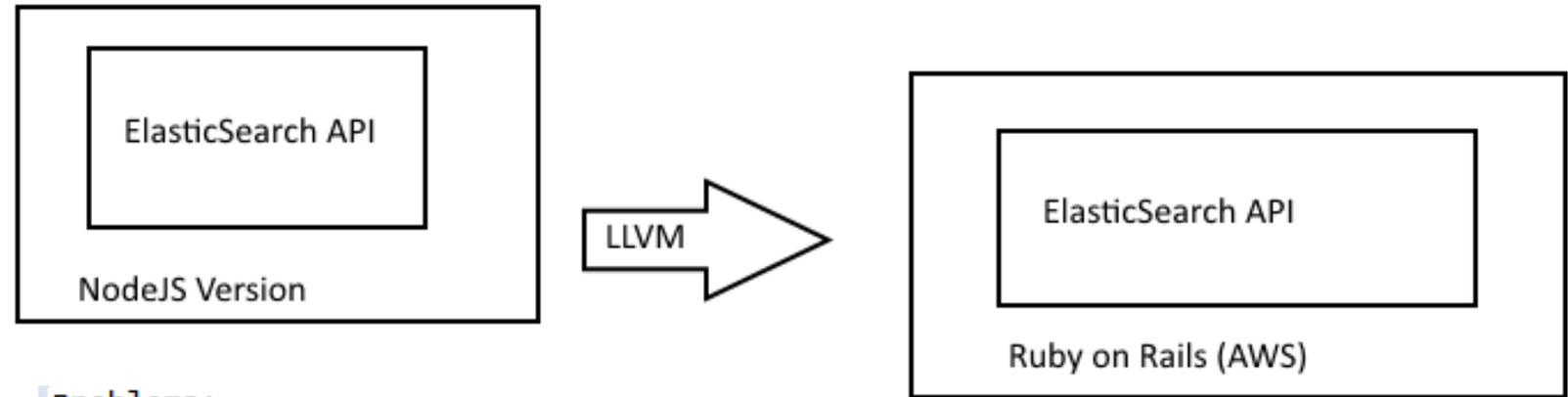


Engineering Goal

Engineering Goal. My engineering goal is to create a framework on Ruby for the Amazon ElasticSearch Relational Database. I tested the framework on Windows 10 and Android. My port operates online in a controlled environment using a package manager such as RubyGems, or offline through sideloading. This offers greater security and portability as a piece of software.

In the end, my goal of creating an efficient, cross-platform, database was successful, as it can run on ARM and WebAssembly, as well as traditional x86-64 based processors without problems.

Portage of API Reference Data



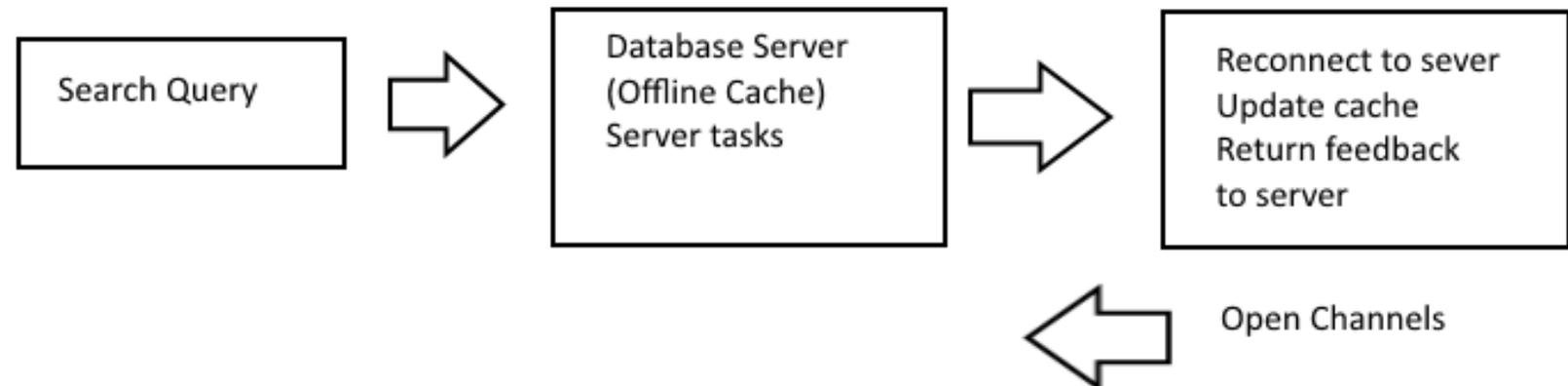
Problems:

- Proprietary Software
- High CPU Usage
- Uses assembly code (Hinders portability)

Benefits:

- Safer (fewer vulnerabilities)
- Efficient use of CPU
- Supports more Architectures (ARM, webAssembly)

REST API Usage



Features of ElasticSearch.net

- One-to-one mapping with REST API
- Generalized, pluggable architecture
- Configurable, automatic discovery of cluster nodes.
- Persistent, Keep-Alive connections.
- Load balancing across all available nodes.
- Child client support.
- TypeScript support out of the box.

elasticsearch-rails-origin 7.2.4

Ruby on Rails integrations for Elasticsearch.

VERSIONS:

7.2.4 - May 31, 2022 (7 KB)
7.2.3 - March 26, 2022 (7 KB)
7.2.2 - March 23, 2022 (7 KB)

[Show all versions \(4 total\) →](#)

DEVELOPMENT DEPENDENCIES (16):

```
bundler >= 0
cane >= 0
lograge >= 0
minitest >= 0
mocha >= 0
oj >= 0
pry >= 0
rails > 3.1
rake ~> 12
require-prof >= 0
ruby-prof >= 0
shoulda-context >= 0
simplecov >= 0
test-unit >= 0
```

 Star 2,953

TOTAL DOWNLOADS

1,420

FOR THIS VERSION

390

GEMFILE:

```
gem 'elasticsearch-'
```

INSTALL:

```
gem install elastic-
```

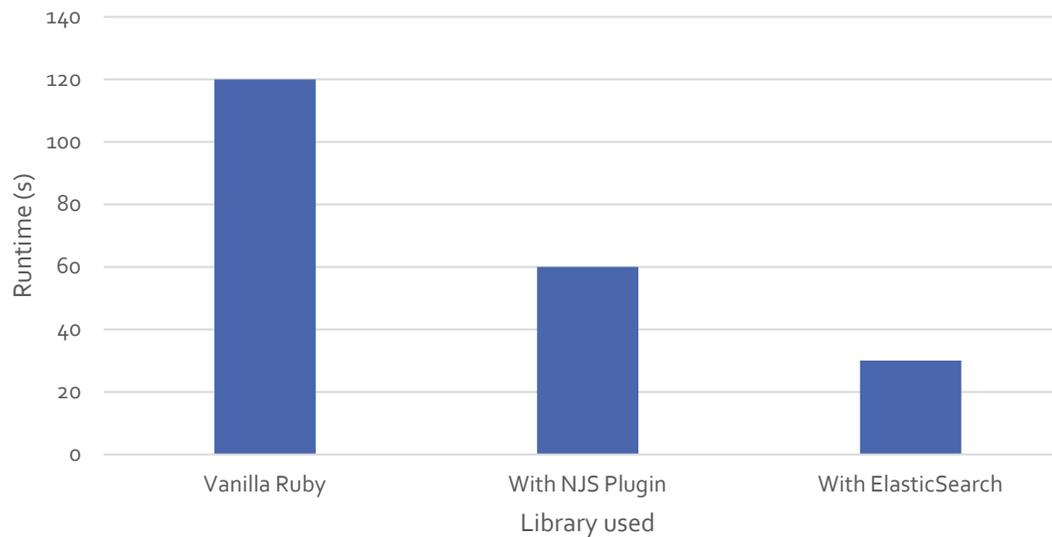
LICENSE:

APACHE 2

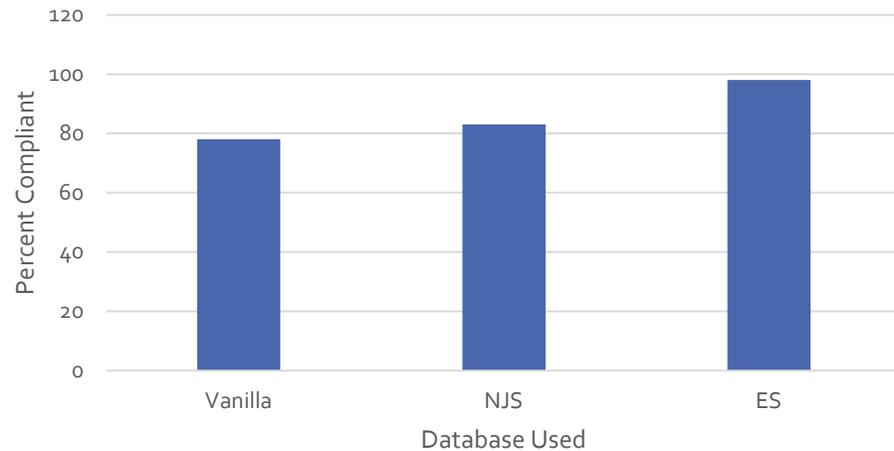
Usage Statistics

Performance

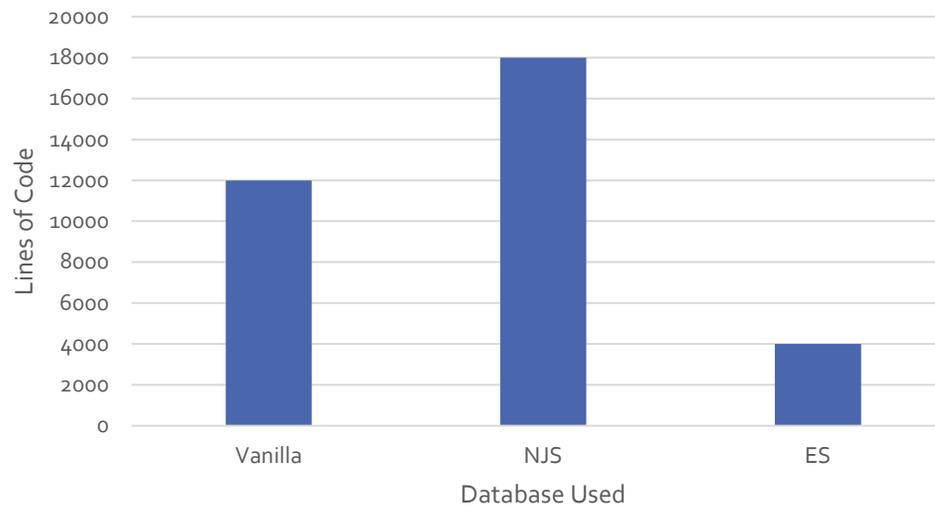
Project Runtime Comparison



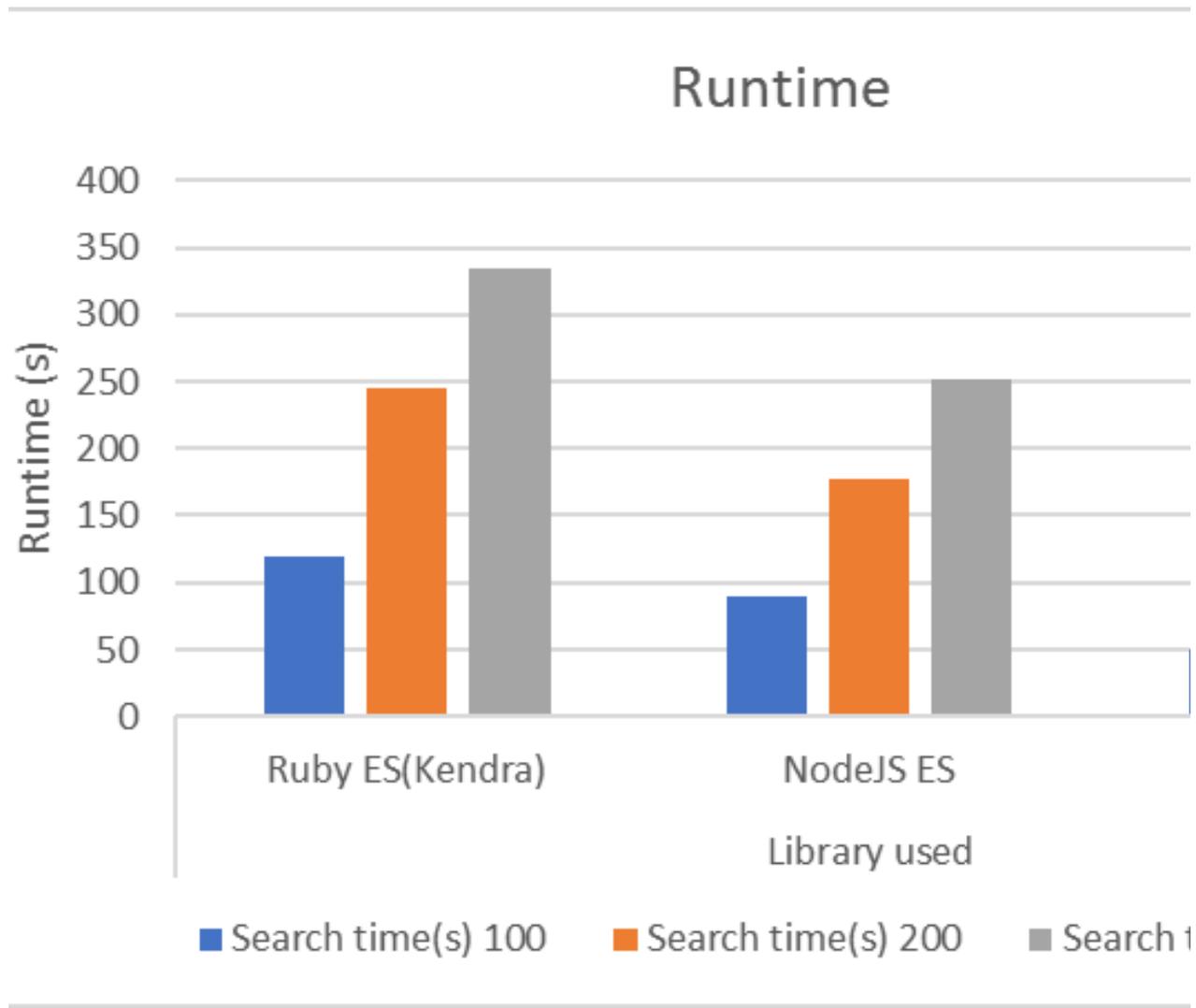
ECMA Compliance



Library Bloat



SEARCH DATA (300 SEARCHES)



MODULE REFERENCE

```
elasticsearch-rails > lib > elasticsearch > rails > instrumentation.rb
21 module Elasticsearch
22   module Rails
23
24     # This module adds support for displaying statistics about search duration in the Rails application log
25     # by integrating with the `ActiveSupport::Notifications` framework and `ActionController` logger.
26     #
27     # == Usage
28     #
29     # Require the component in your `application.rb` file:
30     #
31     #   require 'elasticsearch/rails/instrumentation'
32     #
33     # You should see a output like this in your application log in development environment:
34     #
35     #   Article Search (321.3ms) [index: "article", type: "article", body: {"query": {}}]
36     #
37     # Also, the total duration of the request to Elasticsearch is displayed in the Rails request breakdown:
38     #
39     #   Completed 200 OK in 615ms (Views: 230.9ms | ActiveRecord: 0.0ms | Elasticsearch: 321.3ms)
40     #
41     # @note The displayed duration includes the HTTP transfer -- the time it took Elasticsearch
42     #       to process your request is available in the `response.took` property.
43     #
44     # @see Elasticsearch::Rails::Instrumentation::Publishers
45     # @see Elasticsearch::Rails::Instrumentation::Railtie
46     #
47     # @see http://api.rubyonrails.org/classes/ActiveSupport/Notifications.html
48     #
49     #
50     module Instrumentation
51     end
52   end
53 end
```

LINKED LIBRARIES (VS CODE 2022)

```
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4 # ownership. Spencer Peloquin licenses this file to you under
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8 #
9 # https://mit-license.org/
10 #
11 # Unless required by applicable law or agreed to in writing,
12 # software distributed under the License is distributed on an
13 # "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY
14 # KIND, either express or implied. See the License for the
15 # specific language governing permissions and limitations
16 # under the License.
17
18 require 'pathname'
19 require 'elasticsearch'
20
21 subprojects = ['elasticsearch-rails', 'elasticsearch-persistence']
22 subprojects << 'elasticsearch-model' unless defined?(JRUBY_VERSION)
23
24 __current__ = Pathname(File.expand_path(__dir__))
25
26 def admin_client
27   $admin_client ||= begin
28     transport_options = {}
29     test_suite = ENV['TEST_SUITE'].freeze
30
31     if hosts = ENV['TEST_ES_SERVER'] || ENV['ELASTICSEARCH_HOSTS']
32       split_hosts = hosts.split(',').map do |host|
33         /(http:\/\/\//)?(\S+)/.match(host)[2]
34       end
35
36       host, port = split_hosts.first.split(':')
```

CHANGELOG (2021)

```
1  ## 7.2.1
2
3  * The default git branch `master` has been renamed to `main`
4  * Adds compatibility with Ruby 3 [Pull Request](https://github.com/elastic/elasticsearch-rails/pull/992)
5
6  ## 7.2.0
7
8  * Updates specs and dependency to use with `elasticsearch` v7.14.0.
9  * Update README, remove Virtus (unmaintained)
10 * Updates `Bundler.with_clean_dev` (deprecated) to `with_unbundled_env` [commit](https://github.com/elastic/elasticsearch-rails/commit/e4545e4fe2a1ce80009206c831d5740360bad6c2)
11 * Deal with `nil` document types in Multimodel [commit](https://github.com/elastic/elasticsearch-rails/commit/cd9c309b78de443d2e37760998418616ba34276d)
12 * Update dependency to explicitly support version 7 [commit](https://github.com/elastic/elasticsearch-rails/commit/65942e3da9cabad2f6965e69c8ef6a0994da9408)
13 * Stop emitting FATC log when checking existence of indices [commit](https://github.com/elastic/elasticsearch-rails/commit/20ca39865d77f7109360ca7f0e31212)
14 * Remove `InetSocketAddress` exception test on index health [commit](https://github.com/elastic/elasticsearch-rails/commit/ce57cc17e304b0a4af123c1599f37fb892a5d93a)
15 * Removes dependency on extensions [commit](https://github.com/elastic/elasticsearch-rails/commit/ed070b8329ca48b4cb12b513ac81ed78c88acc61)
16 * Fixes basic template elasticsearch dependency [commit](https://github.com/elastic/elasticsearch-rails/commit/a4ec07b2d097545ca41c13686c9cbfc9eab9e639)
17
18 ### ActiveSupport
19
20 * Fixes indexing to use right logger in client
21 * Updates ES client spec for client 7.14.0
22 * Updates transport references
23
24 ## 7.1.1
25
26 * Fix: Ruby 2.7 deprecation warning on `find_in_batches`
27 * Updates README for generating app with template. Related: #938
28
29 ### ActiveSupport
```

Test and Redesign

- The prototype used a lot of memory and relied heavily on 3rd party software and had a less permissive license. The need for a redesign was evident from the beginning. However, feedback from on AWS allowed me to improve the efficiency of the framework.
- The first thing I did was to create a template on visual studio that would allow me to effectively rewrite the framework. Using original code and help from AWS, I managed to reduce the library size to under a Megabyte. I then compiled the repository for approval from rubygems.
- The result was extremely positive, with a 50% faster compiling time, and a 20% faster interpretation period.

Future Research

- ▶ I have published the gem to the RubyGems Repository under the name “ElasticSearch-Rails-Origin.”
- ▶ Next, I may try to implement a RESTful API to make networking more efficient.
- ▶ Finally, I would spend more time debugging and reducing vulnerabilities.

Bibliography

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Peloquin, Spencer M. “Programming-Ruby.pdf.” Github.io, 2021.

“Rails Crash Course.” Rails Crash Course, <https://railscrashcourse.github.io/>.

Sam Ruby on March 22, et al. Ruby2JS, <https://www.ruby2js.com/>.

terrasky064. “TERRASKY064/Elasticrails-Origin: Updated Repository to [Https://Github.com/terrasky064/Elasticrails](https://Github.com/terrasky064/Elasticrails).” GitHub, <https://github.com/terrasky064/elasticrails-origin>.

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JSON Output (Rails)

{ } *modulexrubykendra.json 1*

{ } module2nodejs.json

{ } module.json ×

{ } module.json

```
1  module Search
2    class TagSerializer
3      include FastJsonapi::ObjectSerializer
4
5      attributes :id, :name, :hotness_score, :supported, short_summary, :rules_html, :time_51
6    end
7  end
8
9  tag = Tag.find(id)
10 serialized_data = Search::TagSerializer.new(tag).serializable_hash.dig(:data, :attributes)
11 SearchClient.index(id: tag.id, index: "tags_development", body: serialized_data)
12
13 SearchClient.get(id: tag.id, index: "tags_development")
14
```

JSON Output (NJS)

} *modulexrubykendra.json* 1

{ } module2nodejs.json ×

{ } module2nodejs.json

```
1  module Search
2    class TagSerializer
3      include FastJsonapi::ObjectSerializer
4
5      attributes :id, :name, :hotness_score, :supported, short_summary, :rules_html, :time_90
6    end
7  end
8
9  tag = Tag.find(id)
10 serialized_data = Search::TagSerializer.new(tag).serializable_hash.dig(:data, :attributes)
11 SearchClient.index(id: tag.id, index: "tags_development", body: serialized_data)
12
13 SearchClient.get(id: tag.id, index: "tags_development")
14
```

Vanilla Ruby (Kendra)

{ } modulexrubykendra.json 1 ×

{ } module2nodejs.json

{ } module.json

{ } modulexrubykendra.json

```
1  module Search
2    class TagSerializer
3      include FastJsonapi::ObjectSerializer
4
5      attributes :id, :name, :hotness_score, :supported, short_summary, :rules_html, :time_120
6    end
7  end
8
9  tag = Tag.find(id)
10 serialized_data = Search::TagSerializer.new(tag).serializable_hash.dig(:data, :attributes)
11 SearchClient.index(id: tag.id, index: "tags_development", body: serialized_data)
12
13 SearchClient.get(id: tag.id, index: "tags_development")
14
```