Elasticsearch

Presented By: Scott Harris and Noah Dunn

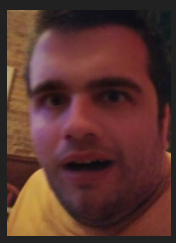
Introductory Information

- System Name: **Elasticsearch**
- Primary Database Model: **Search Engine Database**
- Host Company: **Elasticsearch B.V (AKA Elastic).**
- URL: Link to the Company

The Authors

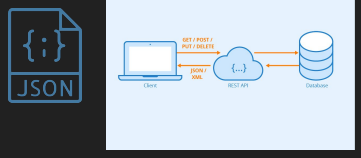
Scott Harris:

Noah Dunn:



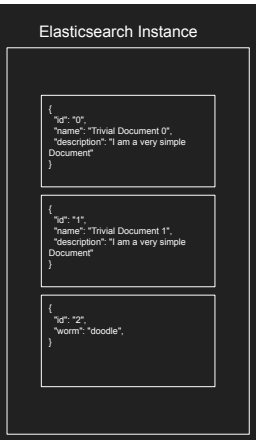
System Overview

- History
  - Based on Apache Lucene
  - First released in 2010
- Intended Usage
  - REST API
  - Retrieving Small Doses of Information
  - Website Searching
  - Focus on Read Operations
- Special Feature(s)
  - Fuzzy or Incomplete Querying
  - Optimized for Data Retrieval
  - Document Store



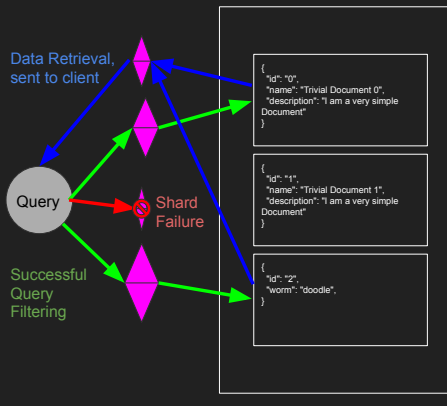
Document Store

- Elasticsearch makes use of JSON Document-Store format
- The ‘Database’ consists of the entire collection of all Documents
- Much like Mongo or other NoSQL solutions, these documents are unstructured and can contain a wide array of keys and values

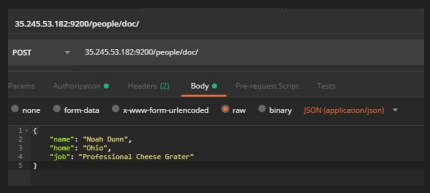


Sharding Visual

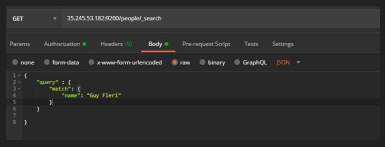
- All Database Processing in Elasticsearch is done via what are called ‘shards’
- Shards are processing units of various sizes that can handle retrieval for queries
- Shards can merge together or split for increased distribution or increased processing power
- Shards provide ‘fault-tolerance’. If one process fails, the other shards will pick up the slack



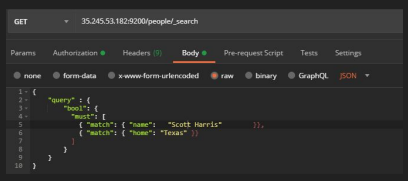
INSERT Query Example



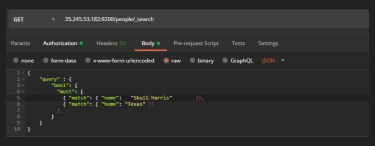
SELECT Query Example

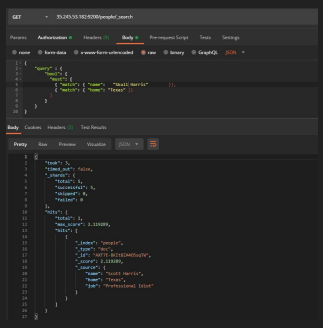


Multi-Conditional Querying



Fuzzy Matching Example





Links, Description, Relevant Documentation

- Official Website
  - https://www.elastic.co/
- Querying Documentation
  - https://www.elastic.co/guide/en/elasticsearch/reference/current/index.html
- A More Complex Look at Sharding
  - https://buildingvts.com/elasticsearch-architectural-overview-a35d3910e515
- Guide: Installation to Querying
  - https://medium.com/@factoryhr/elasticsearch-introduction-implementation-and-example-17dd66c35c35
- Link to Where to Get Install Packages
  - https://www.elastic.co/guide/en/elasticsearch/reference/current/install-elasticsearch.html

Challenges, Issues, Things to keep in mind

- Things Elasticsearch doesn't do well or at all
  - Deletion (Finicky)
  - Joining different documents (Not possible from our research)
  - Bulk insertion
  - There is no custom client offering. Everything is done in REST calls, which can be a negative to those unfamiliar with HTTP or REST.
- Potential DevOPS Issues
  - Google Cloud consumes credit for an instance very quickly
  - Local Installs have to be manually started for use
  - Shard allocation can lead to consuming a large portion of CPU
- When Querying
  - There are at least two ways to write each query: POST body call, and URL modification
  - Do what you find easier