TRƯỜNG ĐẠI HỌC BÁCH KHOA HÀ NỘI
HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Elasticsearch & Kibana

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(https://bkc-group.github.io)

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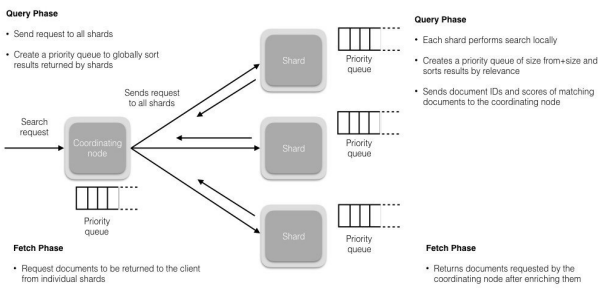
Elasticsearch

- Full-text search engine
- Based on the Lucene library
- HTTP web interface and schema-free JSON documents



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Lab: Elasticsearch and Kibana

- Set up Elasticsearch to store data
- Write/Read data to Elasticsearch
- Install and run Kibana

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Installation

- Install Docker and login
  - https://docs.docker.com/docker-for-windows/install/
  - https://docs.docker.com/docker-for-mac/install/
- Login to @chung-pi gitlab to pull images
  - docker login registry.gitlab.com -u bi-class -p bqp_cSsCJ2kaNjMu1U4A
- Pull images
  - docker pull registry.gitlab.com/chung-pi/bi-docker/elasticsearch
  - docker pull registry.gitlab.com/chung-pi/bi-docker/kibana:latest
- If Internet is not available
  - docker load --input elasticsearch.tar
  - docker load --input kibana.tar

BKC group at HUST
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Start Elasticsearch and Kibana

- Clone bi-class git project
  - https://gitlab.com/chung-pi/bi-class
- Start containers using docker-compose
  - docker-compose up -d --build elasticsearch
  - docker-compose up -d --build kibana

GUI

- Elasticsearch
  - http://localhost:9200
- Kibana
  - http://localhost:5601

Load data to Elasticsearch

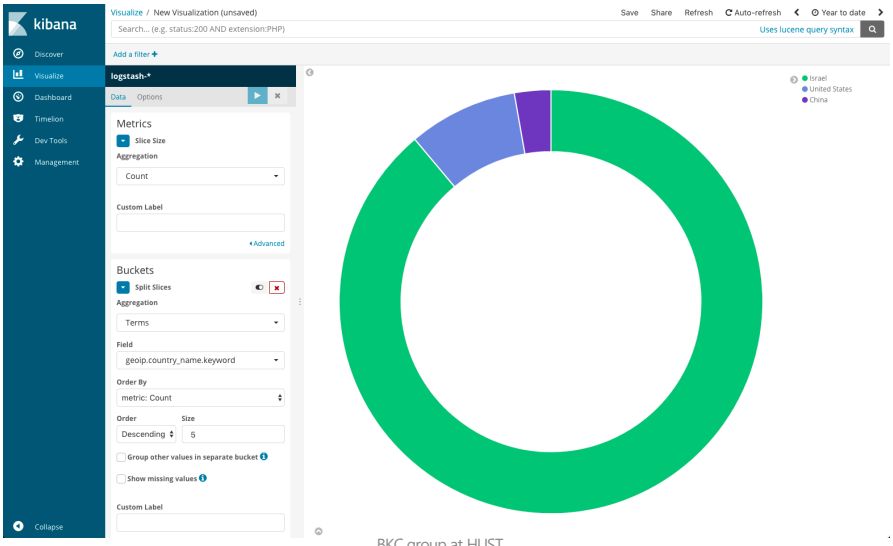
- Using CURL
  - curl -O https://download.elastic.co/demos/kibana/gettingstarted/7.x/accounts.zip
  - unzip accounts.zip
  - curl -H 'Content-Type: application/x-ndjson' -XPOST 'localhost:9200/bank/account/_bulk?pretty' --data-binary @accounts.json
- Checking data using Kibana
  - Open Kibana on browser

Understanding Kibana aggregations

- There are two types of aggregations
  - Bucket aggregations groups documents together in one bucket according to your logic and requirements
  - Metric aggregations are used to calculate a value for each bucket based on the documents inside the

Metric aggregations	Bucket aggregations
• Count • Sum • Average • Media • Min • Max • Unique Count • Standard Deviation • Percentiles • Percentile Ranks	• Date Histogram • Date Range • Filters • Histogram • IPv4 Range • Range • Terms • Significant Terms • Geohash

Example



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Basic Charts

Area	For visualizing time series data and for splitting lines on fields	Users over time
Heat Map	For showing statistical outliers and are often used for latency values	Latency and outliers
Horizontal Bar	Good for showing relationships between two fields	URL and referrer
Line	are a simple way to show time series and are good for splitting lines to show anomalies	Average CPU over time by host
Pie	Useful for displaying parts of a whole	Top 5 memory consuming system procs
Vertical Bar	Great for time series data and for splitting lines across fields	URLs over time

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Data

Data Table	Best way to split across multiple fields in a custom way	Top user, host, pod, container by usage
Gauge	A way to show the status of a specific metric using thresholds you define	Memory consumption limits
Goal	Similar to a Gauge, useful for monitoring a specific metric defined as a goal	No. of errors per service
42 Metric	Useful visualization for displaying a calculation as a single number	No. of Docker containers run.

Map, Time series, and Others

Coordinate Map, Region Map	Help add a geographical dimension to IP-based logs	Geographic origin of web server requests.
Timelion, Visual Builder	Allows you to create more advanced queries based on time series data	Percentage of 500 errors over time
Controls	**Experimental** - Allows you to create selectors or sliders for alternating between options.	Switch between
Markdown	A great way to add a customized text or image based visualization to your dashboard based on markdown syntax	Company logo or a description of a dashboard
Tag Cloud	Helps display groups of words sized by their importance	Countries sending requests to a web server
vega	**Experimental** - allows you to add custom visualizations based on Vega and VegaLite	-

Other tutorials

- https://logz.io/blog/kibana-tutorial/
- https://logz.io/blog/kibana-tutorial-2/