Open Distro
for Elasticsearch

Open Distro for Elasticsearch

Sydney Data Engineering Meetup

Najah Naaji, Solutions Architect, AWS

What is Elasticsearch?

Elasticsearch, Logstash, and Kibana

Sometimes referred to as the "ELK Stack"

Distributed search and analytics engine

Build on Apache Lucene

Easy ingestion and visualization

Other partner solutions

Splunk, Sumo Logic, Logz.io, and Loggly

Rank			DBMS	Score		
Apr 2019	Mar 2019	Apr 2018		Apr 2019	Mar 2019	Apr 2018
1.	1.	1.	Oracle	1279.94	+0.80	-9.85
2.	2.	2.	MySQL	1215.14	+16.89	-11.26
3.	3.	3.	Microsoft SQL Server	1059.96	+12.11	-35.55
4.	4.	4.	PostgreSQL	478.72	+8.91	+83.25
5.	5.	5.	MongoDB	401.98	+0.64	+60.57
6.	6.	6.	IBM Db2	176.05	-1.15	-12.89
7.	↑ 8.	↑ 9.	Redis	146.38	+0.25	+16.27
8.	↑ 9.	8.	Elasticsearch	146.00	+3.21	+14.64
9.	↓ 7.	↓ 7.	Microsoft Access	144.65	-1.55	+12.43
10.	10.	↑ 11.	SQLite	124.21	-0.66	+8.23

Source: DB-Engines.com, April 2019

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Machine data driving Elasticsearch growth

Machine-generated data is growing 10x faster vs. business data… logs, logs, and more logs

IT and DevOps

databases, servers, storage, networking

Increase in IoT and mobile devices

gaming, sensors, web content

Cloud-based architectures

Source: insideBigData—The Exponential Growth of Data, February 16, 2017

It is a database

1

Send data as JSON via REST APIs

2

Data is indexed—all fields searchable, including nested JSON

3

Queries, via REST APIs, allow fielded matching, Boolean expressions, include sorting and analysis

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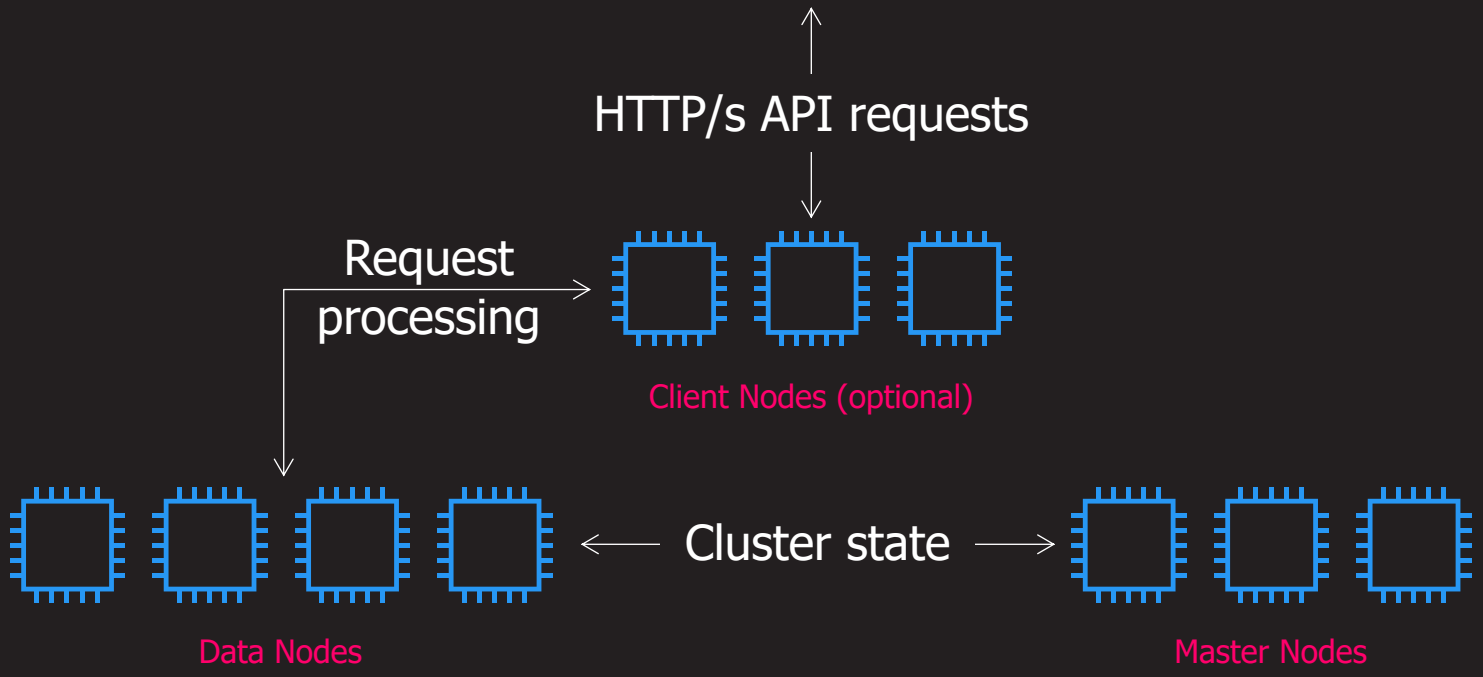
Elasticsearch runs on a cluster of instances



Search

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE

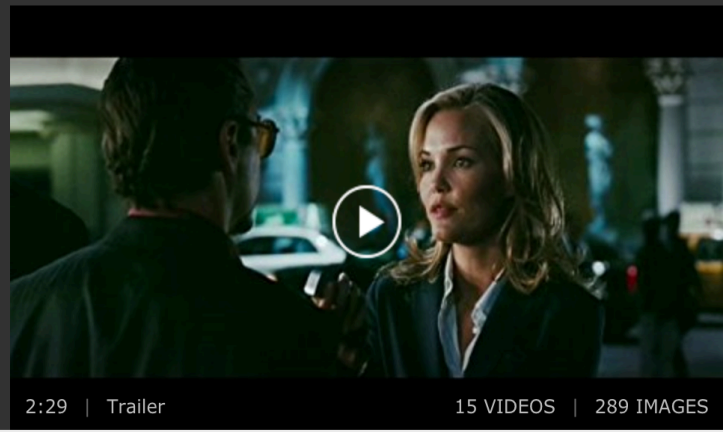
SHARE

Iron Man (2008)

7.9/10
797,560

Rate This

PG-13 | 2h 6min | Action, Adventure, Sci-Fi | 2 May 2008 (USA)



prime video Watch Now
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ON TV | ON DISC | ALL

After being held captive in an Afghan cave, billionaire engineer Tony Stark creates a unique weaponized suit of armor to fight evil.

Director: Jon Favreau

Writers: Mark Fergus (screenplay), Hawk Ostby (screenplay) | 6 more credits »

Stars: Robert Downey Jr., Gwyneth Paltrow, Terrence Howard |
See full cast & crew »

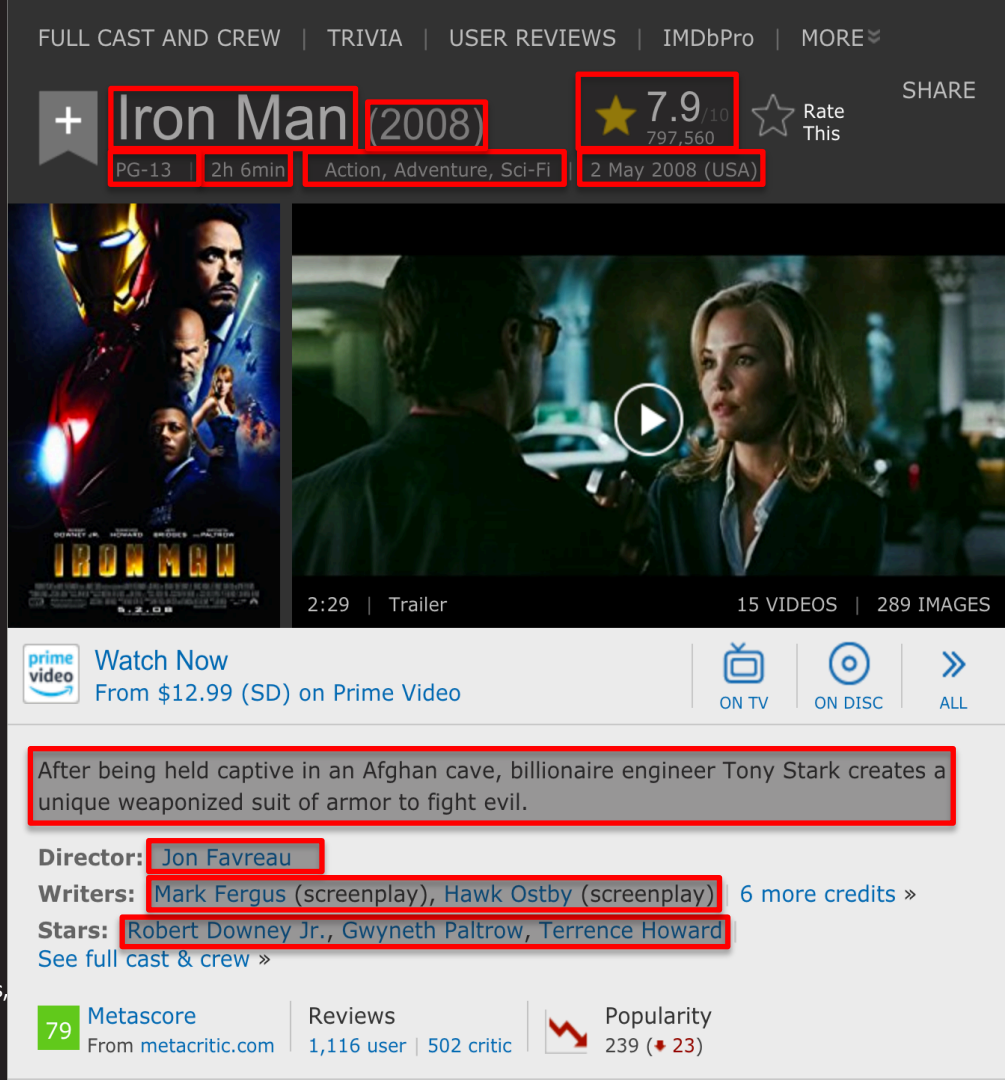
79 Metascore
From metacritic.com

Reviews
1,116 user | 502 critic

Popularity
239 (23)

Data is structured: title, description, ratings, etc.

Search documents are structured representations of entities



You use the indexing APIs to send data to Elasticsearch*

POST endpoint/index/id

```
{
    Field: Value,
    Field: Value,
    Field: Value …
}
```

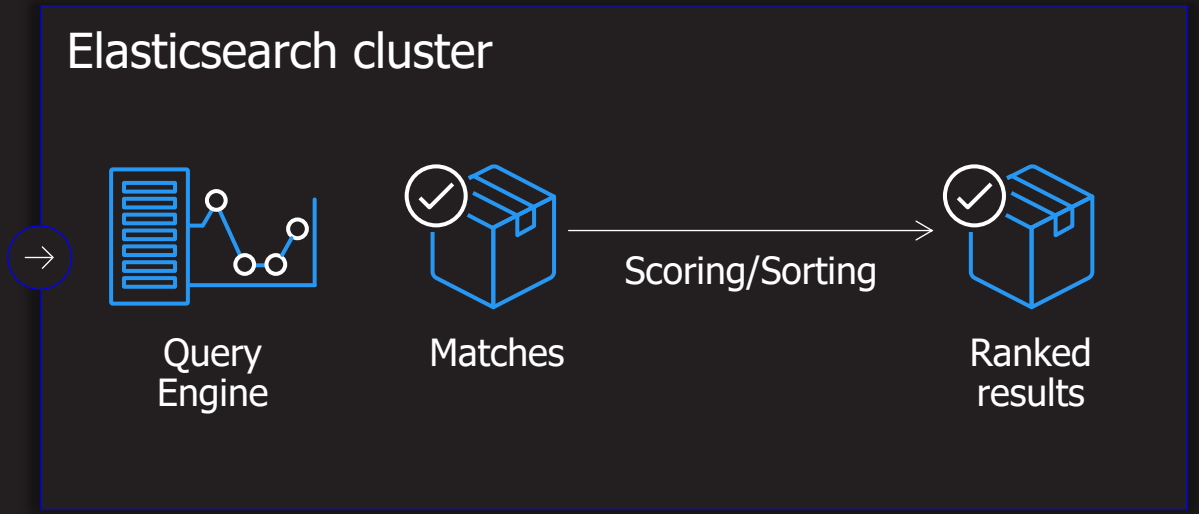
POST endpoint/index/_bulk

```
{ Command }
{ Field: Value, … }
{ Command }
{ Field: Value, … }
```

* Your ingestion tools will probably automate this

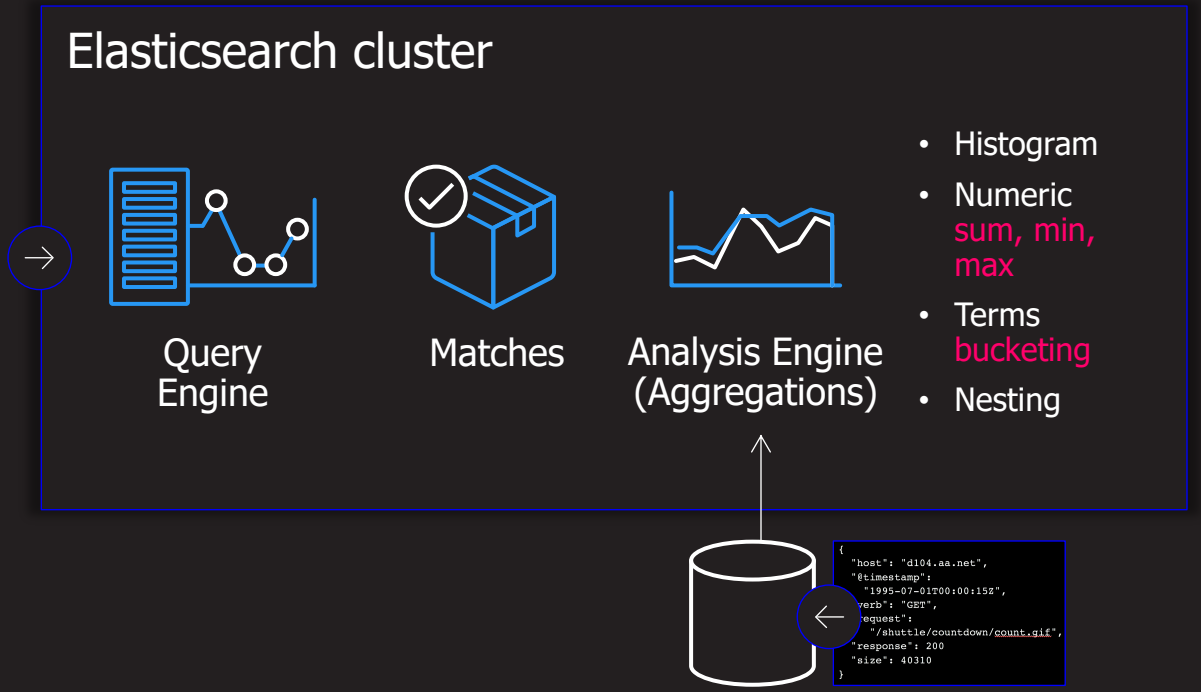
You use the query APIs to retrieve data from Elasticsearch

```
GET logs/log/_search
{
  "query": {
    "term": {
      "verb.keyword": {
        "value": "GET"
      }
    }
  }
}
```



You use aggregations to analyze log data

```
GET logs/log/_search
{
  "query": {
    "term": {
      "verb.keyword": {
        "value": "GET"
      }
    }
  }
}
```



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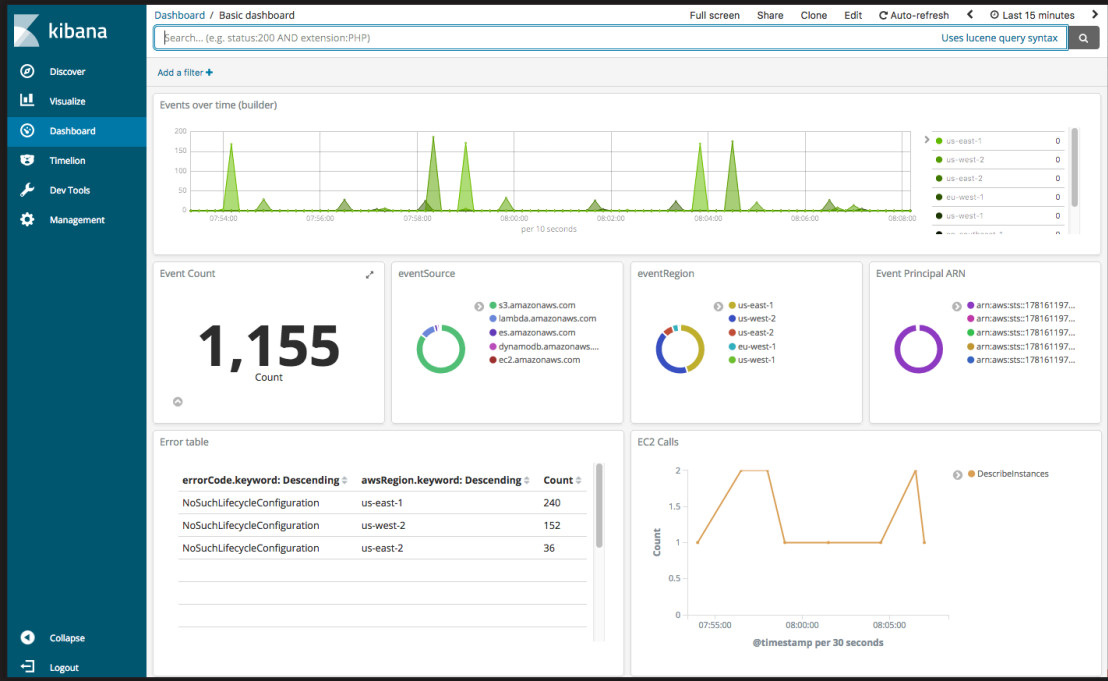
Kibana is a lightweight, real-time visualization tool



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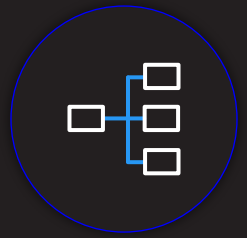
An Apache 2.0-licensed distribution of Elasticsearch enhanced with enterprise-grade security, alerting, SQL, and more

Open Distro for Elasticsearch

BENEFITS

100% open source

Providing you the freedoms, so you can freely view, use, change, and distribute the code



Enterprise-grade

Delivering security and advanced capabilities such as alerting, SQL, and cluster diagnostics

Community-driven

Providing individuals and organizations the freedom to easily contribute changes to the distro

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Security

KEEP YOUR DATA SECURE

Encryption

Keep your data secure when in transit

Authentication

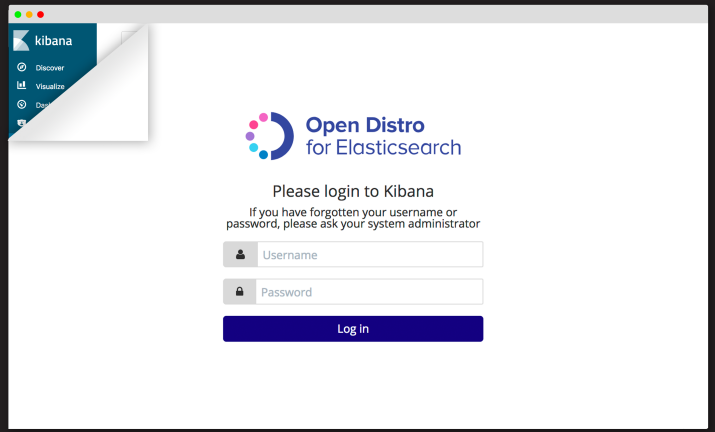
Leverage your existing authentication infrastructure

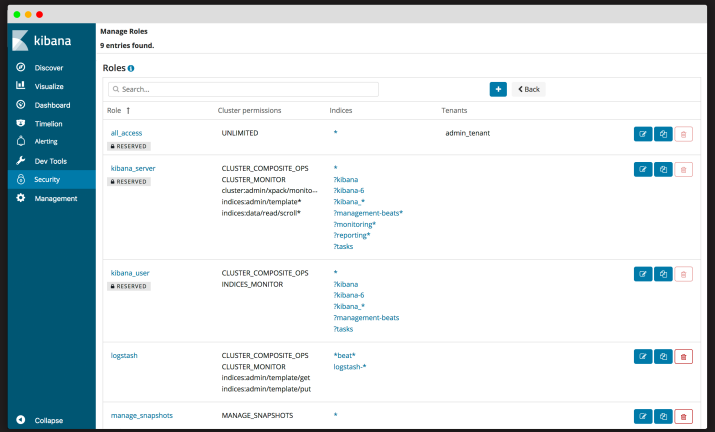
RBAC

Granular access control to control the user actions on your cluster

Audit logging

Track and record all user actions and meet HIPAA, PCI compliance





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Alerting

RECEIVE ALERTS ON YOUR DATA

Create monitors

Query the data you want to and receive alerts on it

Customize alert conditions

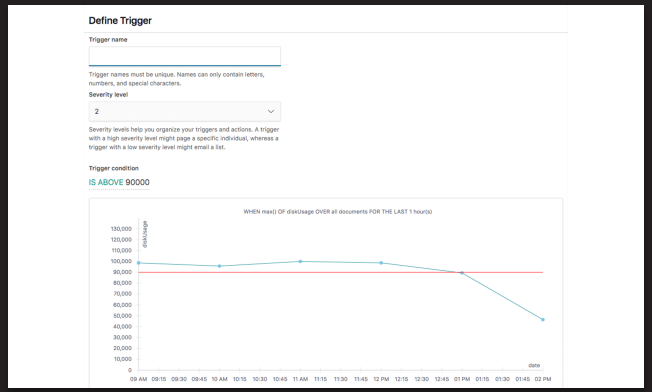
Define alerting threshold and severity for multiple trigger conditions

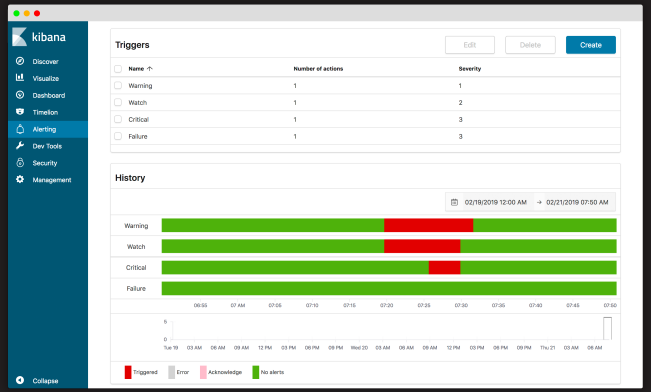
Get notifications

Built-in integrations for webhook and Slack to get notified on the channels you use

View alerts

All alert executions are indexed for easy tracking and visualization





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SQL support

QUERY DATA WITH SQL

Comprehensive SQL support

Supports over 40 functions, data types, and commands including join support

Translate SQL to JSON

Create JSON using SQL to configure sophisticated access control policies

Use existing tools

Provides a JDBC driver so you can use a variety of business intelligence, analytics, and ETL tools

```
# Get all accounts with JSON document response
GET _sql
{
  "query": "SELECT * FROM accounts"
}

# Get all accounts with CSV response
GET _sql?format=csv
{
  "query": "SELECT * FROM accounts"
}

# Get average age of employees
GET _sql?format=csv
{
  "query": "SELECT AVG(age) as avg, employer,
state, city FROM accounts GROUP BY employer
.keyword, state.keyword, city.keyword"
}

# Compose SQL query to Elasticsearch query DSL
GET _sql/_explain
{
  "query": "SELECT AVG(age) as avg, employer,
state, city FROM accounts GROUP BY employer
.keyword, state.keyword, city.keyword"
}
```

index	id	score	account_number	balance	firstname	lastname	age	gen
accounts	25	1	25	$ 40,540.00	Virginia	Ayala	39	F
accounts	44	1	44	$ 34,487.00	Aurelia	Harding	37	M
accounts	99	1	99	$ 47,159.00	Ratliff	Heath	39	F
accounts	119	1	119	$ 49,222.00	Laverne	Johnson	28	F
accounts	126	1	126	$ 3,607.00	Effie	Gates	39	F
accounts	145	1	145	$ 47,406.00	Rowena	Wilkinson	32	M
accounts	183	1	183	$ 14,223.00	Hudson	English	26	F
accounts	190	1	190	$ 3,150.00	Blake	Davidson	30	F
accounts	208	1	208	$ 40,760.00	Garcia	Hess	26	F
accounts	222	1	222	$ 14,764.00	Rachelle	Rice	36	M
accounts	227	1	227	$ 19,780.00	Coleman	Berg	22	M
accounts	253	1	253	$ 20,240.00	Melissa	Gould	31	M
accounts	260	1	260	$ 2,726.00	Kari	Skinner	30	F
accounts	265	1	265	$ 46,910.00	Marion	Schneider	26	F
accounts	335	1	335	$ 35,433.00	Vera	Hansen	24	M
accounts	366	1	366	$ 42,368.00	Lydia	Cooke	31	M
accounts	385	1	385	$ 11,022.00	Rosalinda	Valencia	22	M
accounts	397	1	397	$ 37,418.00	Leonard	Gray	36	F
accounts	400	1	400	$ 20,685.00	Kane	King	21	F
accounts	450	1	450	$ 2,643.00	Bradford	Nielsen	25	M
accounts	486	1	486	$ 35,902.00	Dixie	Fuentes	22	F

```
SELECT Avg(age) AS avg,
       employer,
       state,
       city
FROM   accounts
GROUP  BY employer.keyword,
          state.keyword,
          city.keyword
```

```
{
  "from": 0,
  "size": 0,
  "_source": {
    "includes": [
      "AVG",
      "employer",
      "state",
      "city"
    ],
    "excludes": []
  },
  "stored_fields": [
    "employer",
    "state",
    "city"
  ],
  "aggregations": {
    "employer.keyword": {
      "terms": {
        "field": "employer.keyword",
        "size": 200,
        "min_doc_count": 1,
```


Open Distro for Elasticsearch

Performance Analyzer

GET DEEP DIAGNOSTIC INSIGHTS INTO YOUR CLUSTER

Identify bottlenecks across the stack

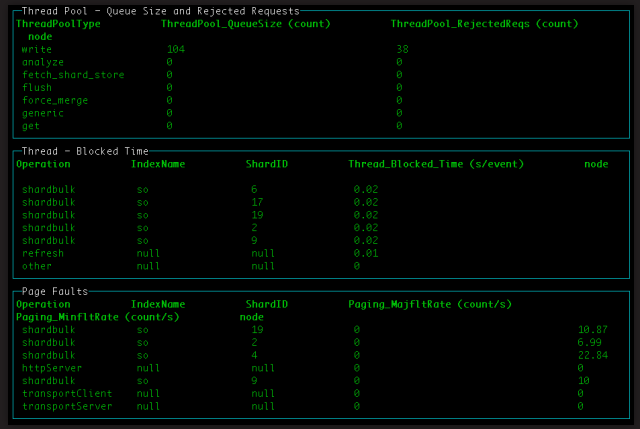
Provides a powerful REST API for querying Elasticsearch metrics to diagnose issues across stack

Runs independent of your cluster

Perform diagnostics even if the cluster is under duress

Analyze hundreds of data points

Supports over 60 metrics across 10 dimensions for instrumentation of your cluster health



Open Distro for Elasticsearch

Flexible deployment options

Docker

RPM

Debian

Demo !

More Coming!

Index Management

Deploy policies to run periodic operations on your indices

k-NN Search

High-scale, low-latency nearest neighbor search

Job Scheduler

Build plugins that can run periodic jobs on your cluster

Community and contributions

Open Distro for Elasticsearch's success is driven by the community's participation, contributions, and innovation to the project.

You can follow project discussions, engage with fellow community members, contribute PRs, file bugs or request a feature at:

Discussion forums
https://discuss.opendistrocommunity.dev/

Community
https://github.com/opendistro-for-elasticsearch/community/issues

Thank you!