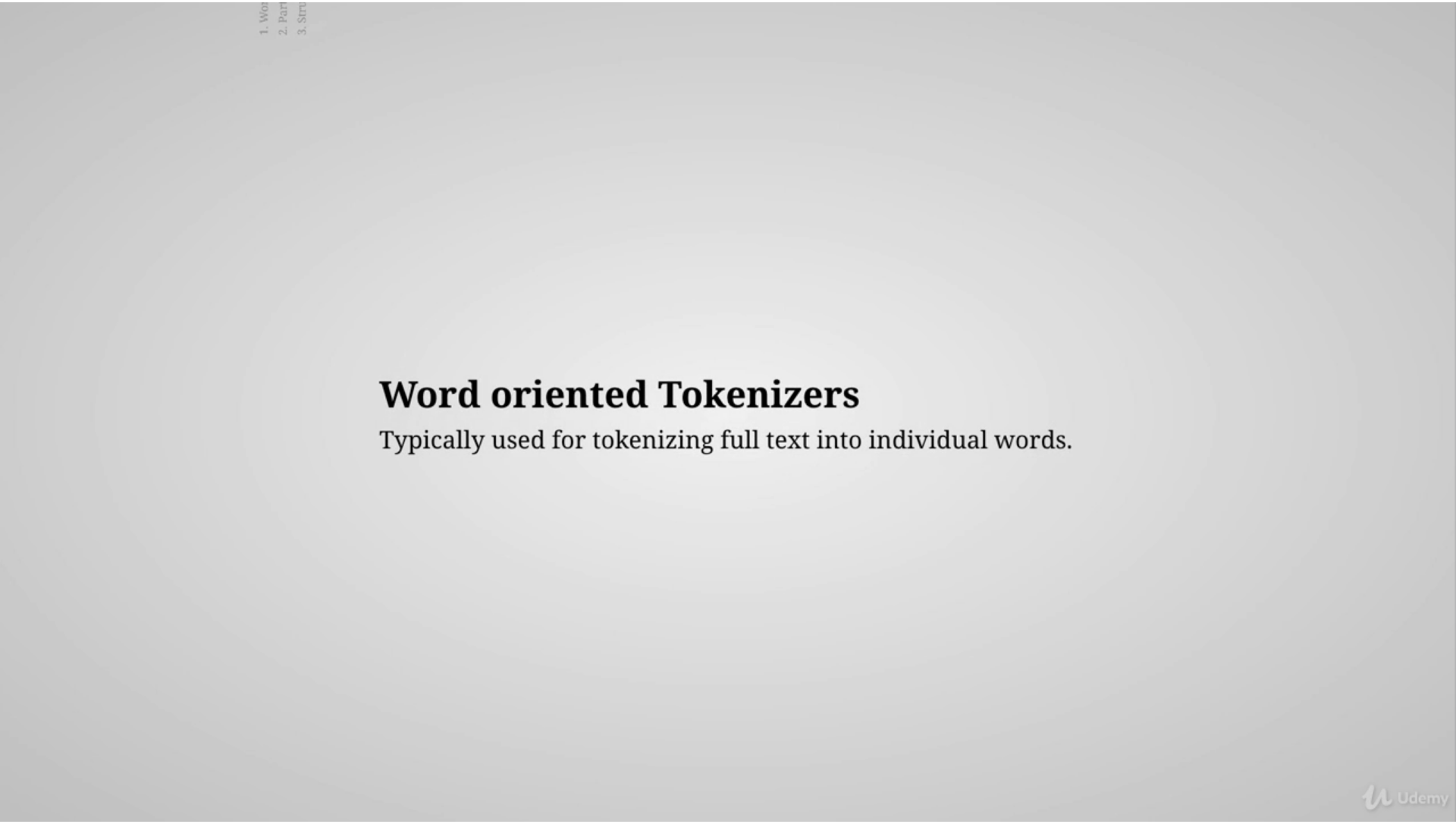
Tokenizers

1. Word Oriented Tokenizers
2. Partial Word Tokenizers
3. Structured Text Tokenizers

Tokenizers


Word oriented Tokenizers
Typically used for tokenizing full text into individual words.

Tokenizers

Standard Tokenizer `(standard)`

Divides text into terms on word boundaries and removes most symbols. Usually the best choice.

"I'm in the mood for drinking semi-dry red wine!"

[I'm, in, the, mood, for, drinking, semi, dry, red, wine]

Tokenizers

Letter Tokenizer `(letter)`

Divides text into terms when encountering a character that is not a letter.

"I'm in the mood for drinking semi-dry red wine!"

[I, m, in, the, mood, for, drinking, semi, dry, red, wine]

Tokenizers

Lowercase Tokenizer `(lowercase)`

Works like the `letter` tokenizer, but also lowercases all terms.

"I'm in the mood for drinking semi-dry red wine!"

[i, m, in, the, mood, for, drinking, semi, dry, red, wine]

Tokenizers

Whitespace Tokenizer `(whitespace)`

Divides text into terms when encountering whitespace characters.

"I'm in the mood for drinking semi-dry red wine!"

[I'm, in, the, mood, for, drinking, semi-dry, red, wine!]

Tokenizers

UAX URL Email Tokenizer (`uax_url_email`)

Like the `standard` tokenizer, but treats URLs and e-mail addresses as single tokens.

"Contact us at info@codingexplained.com or visit https://codingexplained.com"

[Contact, us, at, info@codingexplained.com, or, visit, https://codingexplained.com]

Tokenizers

Partial Word Tokenizers

Breaks up text or words into small fragments. Used for partial word matching.

Tokenizers

N-Gram Tokenizer (ngram)

Breaks text into words when encountering certain characters and then emits N-grams of the specified length.

"Red wine"

[Re, Red, ed, wi, win, wine, in, ine, ne]

Tokenizers

Edge N-Gram Tokenizer (`edge_ngram`)

Breaks text into words when encountering certain characters and then emits N-grams of each word beginning from the start of the word.

"Red wine"

[Re, Red, wi, win, wine]

Tokenizers

Structured Text Tokenizers

Used for structured text such as e-mail addresses, zip codes, identifiers, etc.

Tokenizers

Keyword Tokenizer `(keyword)`

No-op tokenizer which outputs the exact same text as a single term.

"I'm in the mood for drinking semi-dry red wine!"

[I'm in the mood for drinking semi-dry red wine!]

Tokenizers

Pattern Tokenizer `(pattern)`

Uses a regular expression to split text into terms when matching a word separator. Alternatively captures matched text as terms.

"I, like, red, wine!"

[I, like, red, wine!]

Tokenizers

Path Tokenizer (path_hierarchy)

Splits hierarchical values (e.g. file system paths) and emits a term for each component in the tree.

/path/to/some/directory

[/path, /path/to, /path/to/some, /path/to/some/directory]

Aggregations

It's Not Just For Search Anymore

Metrics

Average, stats, min/max, percentiles, etc.

Buckets

Histograms, ranges, distances, significant terms, etc.

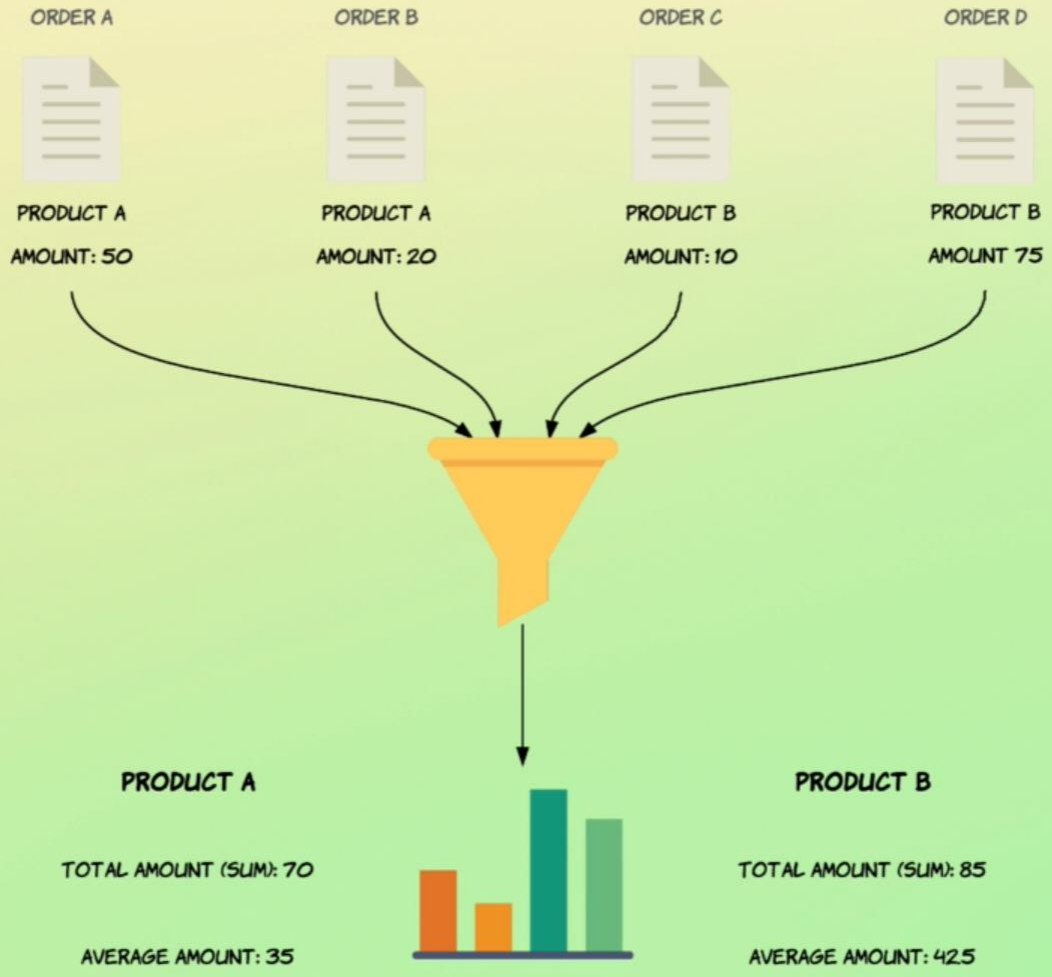
Pipelines

Moving average, average bucket, cumulative sum, etc.

Matrix

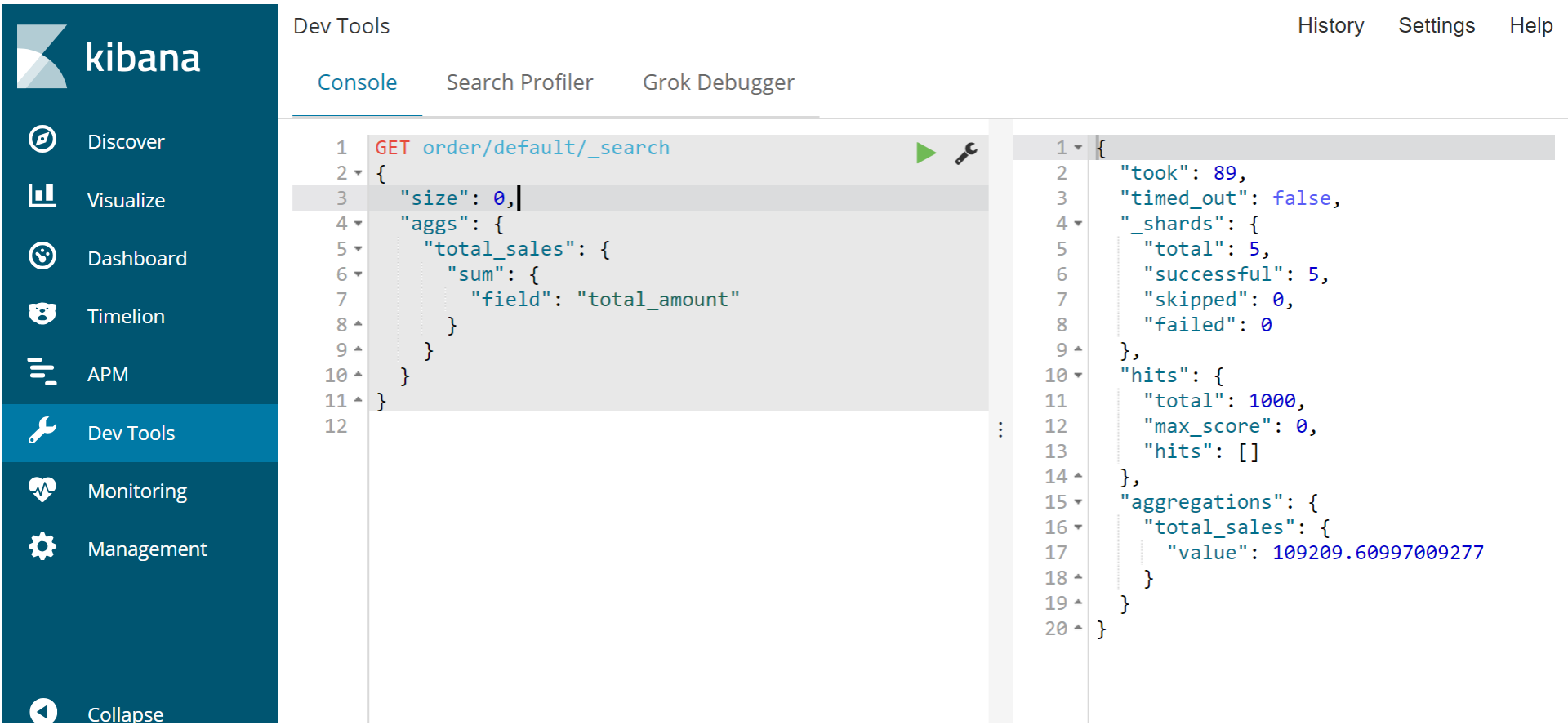
Matrix stats

Aggregations

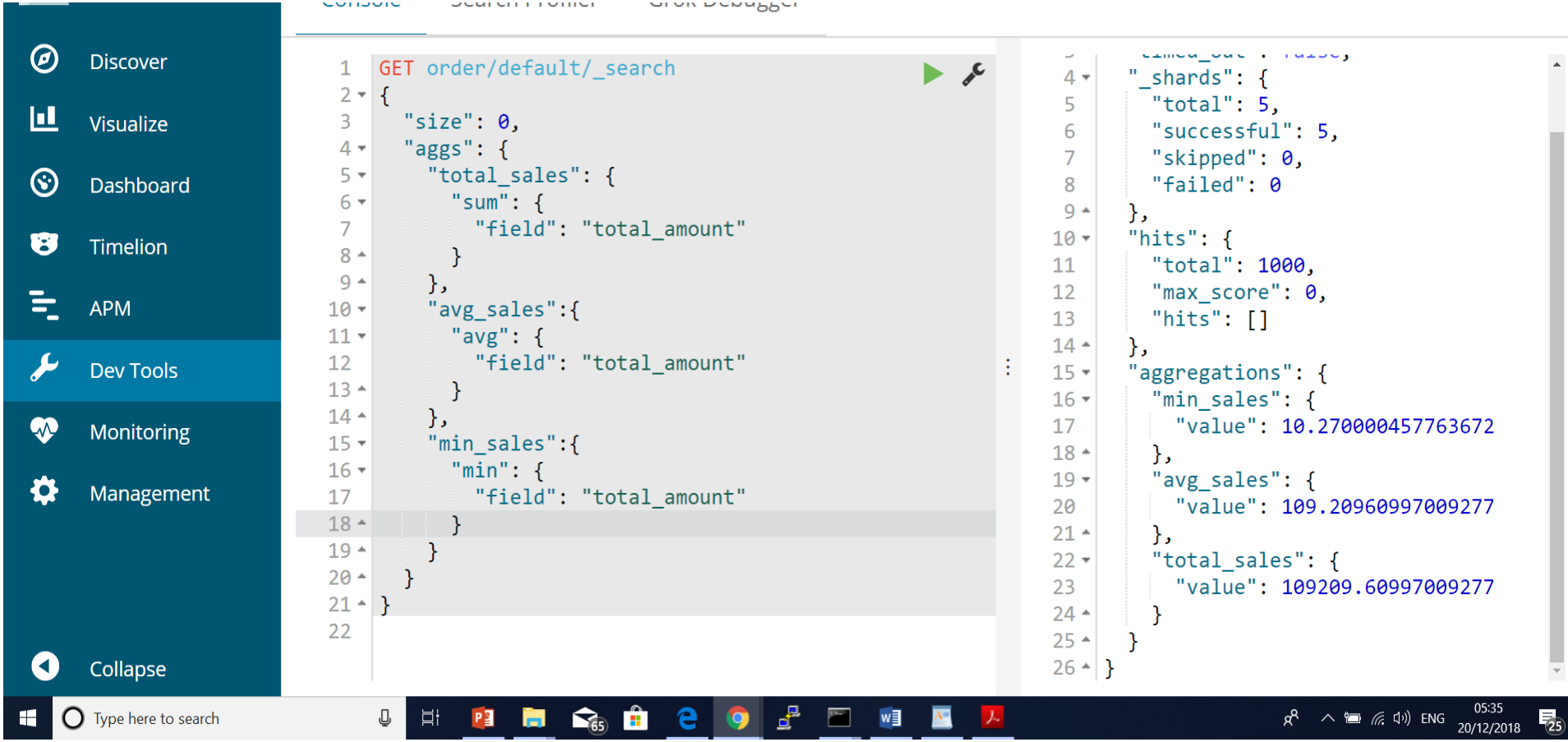


Aggregations

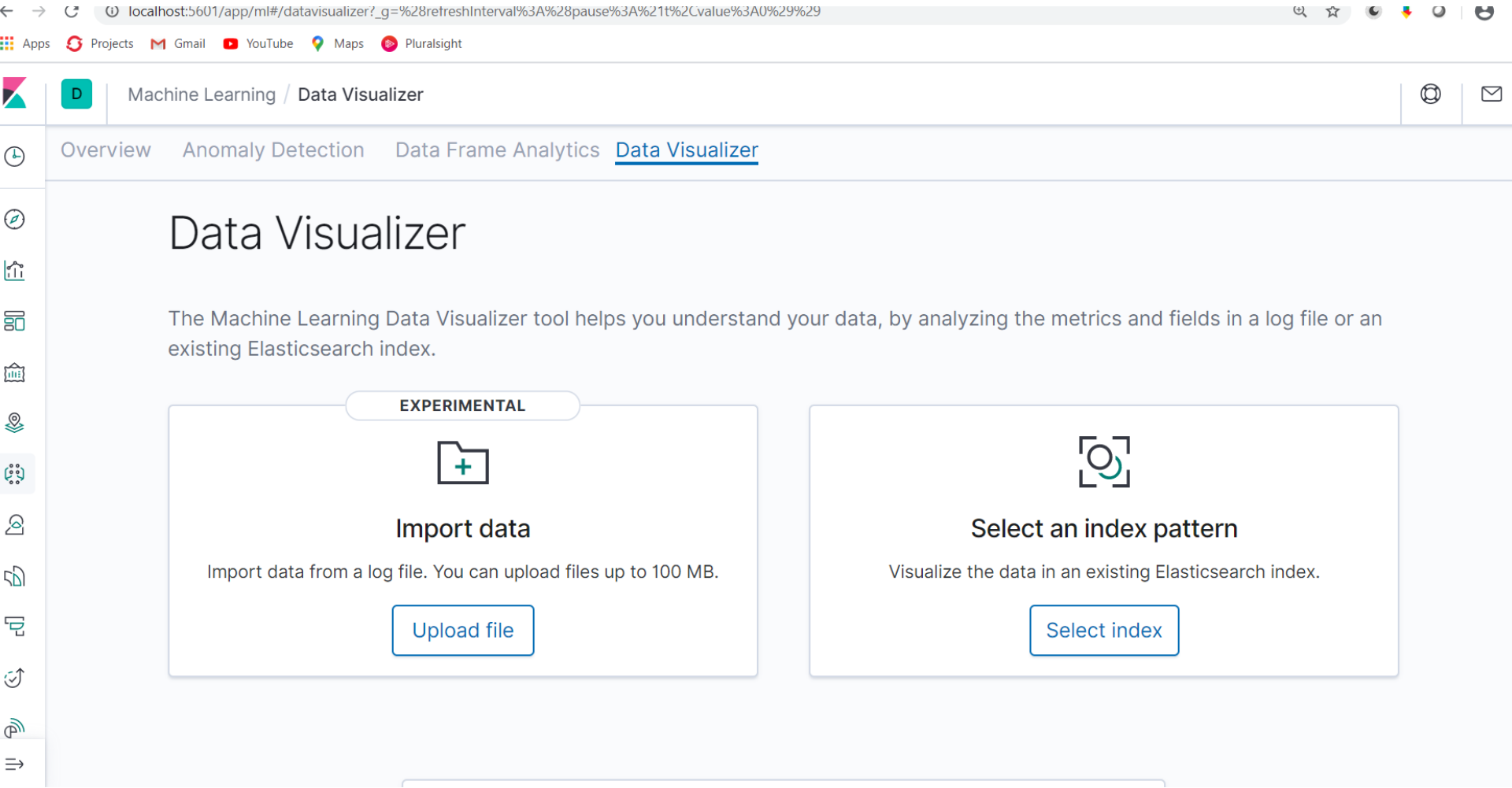
There are many occasions when aggregations are required but search hits are not. For these cases the hits can be ignored by setting size=0.



Aggregations



Data Visualizer



- `"size":10000` Get at most 10000 buckets. Default is 10.
- `"size":0` In result, `"hits"` contains 10 documents by default.

Let's Learn By Example

Bucket by rating value:

```
curl -XGET '127.0.0.1:9200/ratings/_search?size=0&pretty'
-d '
{
    "aggs": {
        "ratings": {
            "terms": {
                "field": "rating"
            }
        }
    }
}'
```

Gmail | Elastic Kibana

localhost:5601/app/kibana#/dev_tools/console

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D Dev Tools

Console | Search Profiler | Grok Debugger | Painless Lab BETA

History Settings Help

200 - OK 585 ms

```
GET movies/_search
{
  "aggs": {
    "ratings": {
      "terms": {
        "field": "rating"

      }
    }
  }
}
```

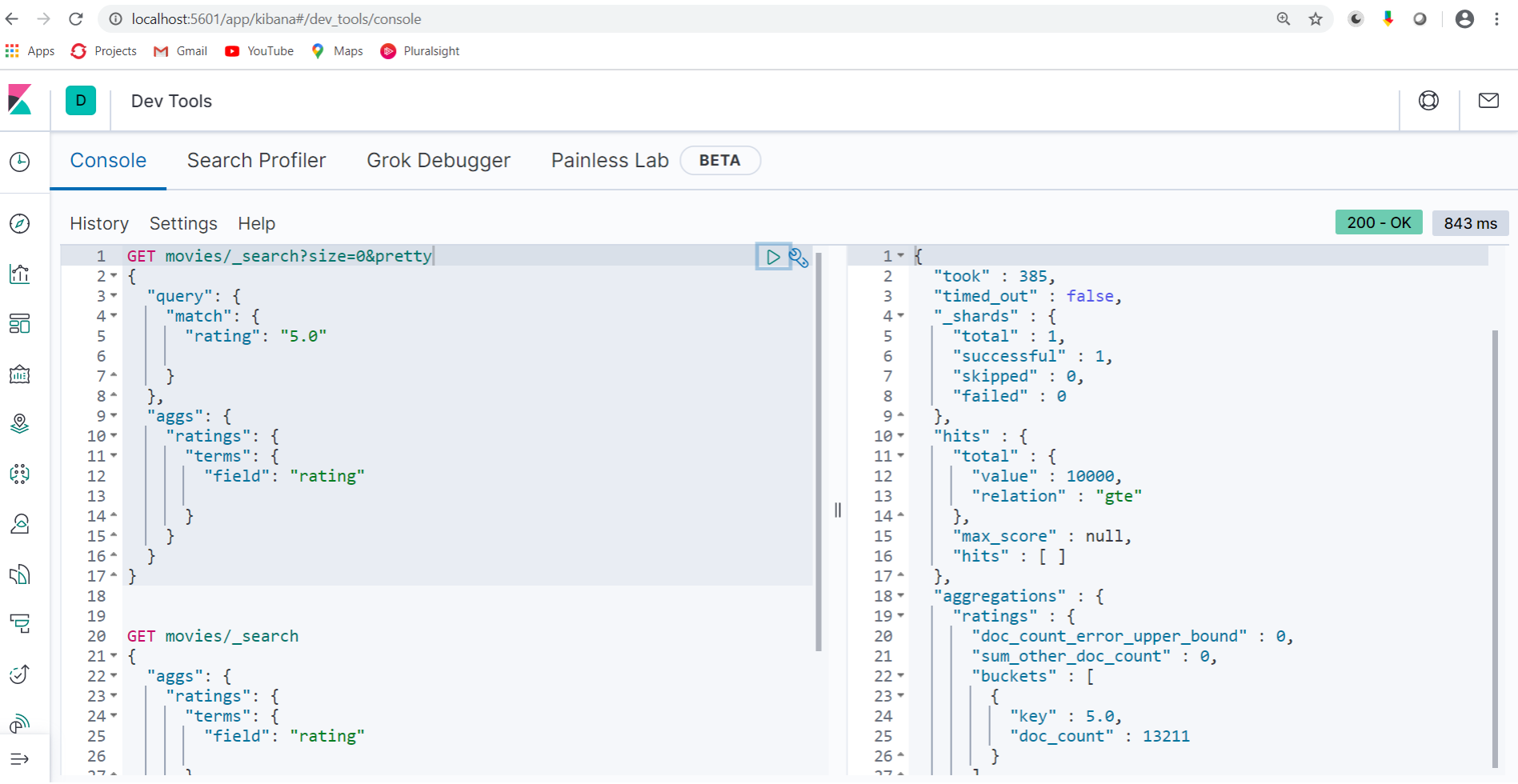
```
},
"aggregations" : {
  "ratings" : {
    "doc_count_error_upper_bound" : 0,
    "sum_other_doc_count" : 0,
    "buckets" : [
      {
        "key" : 4.0,
        "doc_count" : 26818
      },
      {
        "key" : 3.0,
        "doc_count" : 20047
      },
      {
        "key" : 5.0,
        "doc_count" : 13211
      },
      {
        "key" : 3.5,
        "doc_count" : 13136
      },
      {
        "key" : 4.5,
        "doc_count" : 8551
      },
```

Type here to search ENG 19:22 04/06/2020

Let's Learn By Example

Count only 5-star ratings:

```
curl -XGET '127.0.0.1:9200/ratings/_search?size=0&pretty' -d
'
{
    "query": {
        "match": {
            "rating": 5.0
        }
    },
    "aggs" : {
        "ratings": {
            "terms": {
                "field" : "rating"
            }
        }
    }
}'
```


localhost:5601/app/kibana#/dev_tools/console
Apps
Projects
Gmail
YouTube
Maps
Pluralsight
D
Dev Tools
Console
Search Profiler
Grok Debugger
Painless Lab
BETA
History
Settings
Help
200 - OK
843 ms
GET movies/_search?size=0&pretty
{
"query": {
"match": {
"rating": "5.0"
}
},
"aggs": {
"ratings": {
"terms": {
"field": "rating"
}
}
}
}
GET movies/_search
{
"aggs": {
"ratings": {
"terms": {
"field": "rating"
{
"took" : 385,
"timed_out" : false,
"_shards" : {
"total" : 1,
"successful" : 1,
"skipped" : 0,
"failed" : 0
},
"hits" : {
"total" : {
"value" : 10000,
"relation" : "gte"
},
"max_score" : null,
"hits" : [ ]
},
"aggregations" : {
"ratings" : {
"doc_count_error_upper_bound" : 0,
"sum_other_doc_count" : 0,
"buckets" : [
{
"key" : 5.0,
"doc_count" : 13211
}

Let’s Learn By Example

Average rating for Star Wars:

```
curl -XGET '127.0.0.1:9200/ratings/_search?size=0&pretty' -d ‘
{
    "query": {
        "match_phrase": {
            "title": "Star Wars Episode IV"
        }
    },
    "aggs" : {
        "avg_rating": {
            "avg": {
                "field" : "rating"
            }
        }
    }
}'
```

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localhost:5601/app/kibana#/dev_tools/console

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Dev Tools

Console | Search Profiler | Grok Debugger | Painless Lab BETA

History Settings Help

200 - OK 111 ms

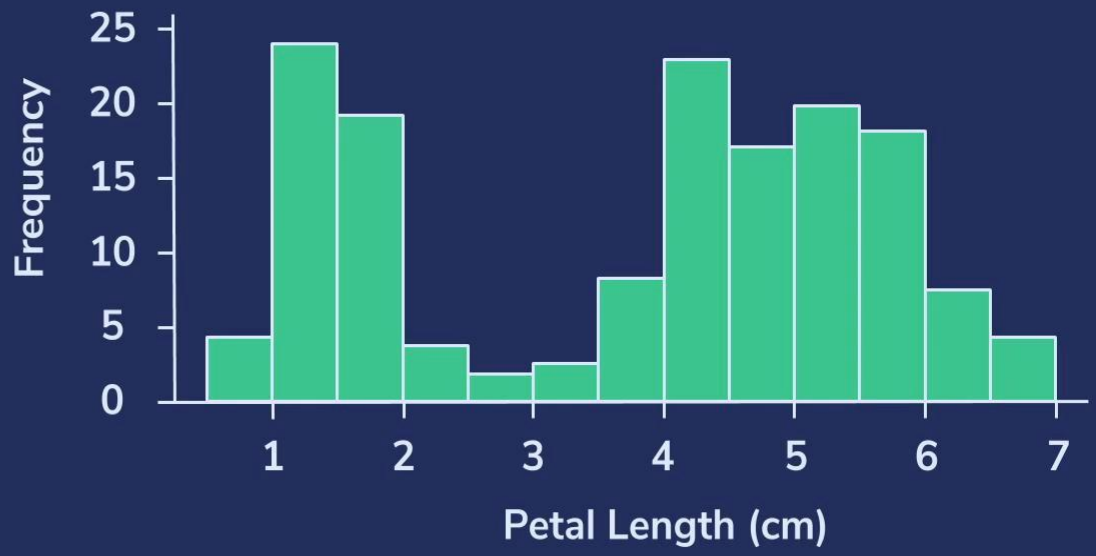
```
GET movies/_search?size=0&pretty
{
  "query": {
    "match": {
      "movieId": 1
    }
  },
  "aggs": {
    "ratings": {
      "avg": {
        "field": "rating"
      }
    }
  }
}


GET movies/_search
{
  "query": {
    "match_phrase": {
      "title": "Star Wars Episode IV"
    }
  }
```

```
{
  "took" : 35,
  "timed_out" : false,
  "_shards" : {
    "total" : 1,
    "successful" : 1,
    "skipped" : 0,
    "failed" : 0
  },
  "hits" : {
    "total" : {
      "value" : 215,
      "relation" : "eq"
    },
    "max_score" : null,
    "hits" : [ ]
  },
  "aggregations" : {
    "ratings" : {
      "value" : 3.9209302325581397
    }
  }
}
```

Type here to search ENG 19:27 04/06/2020

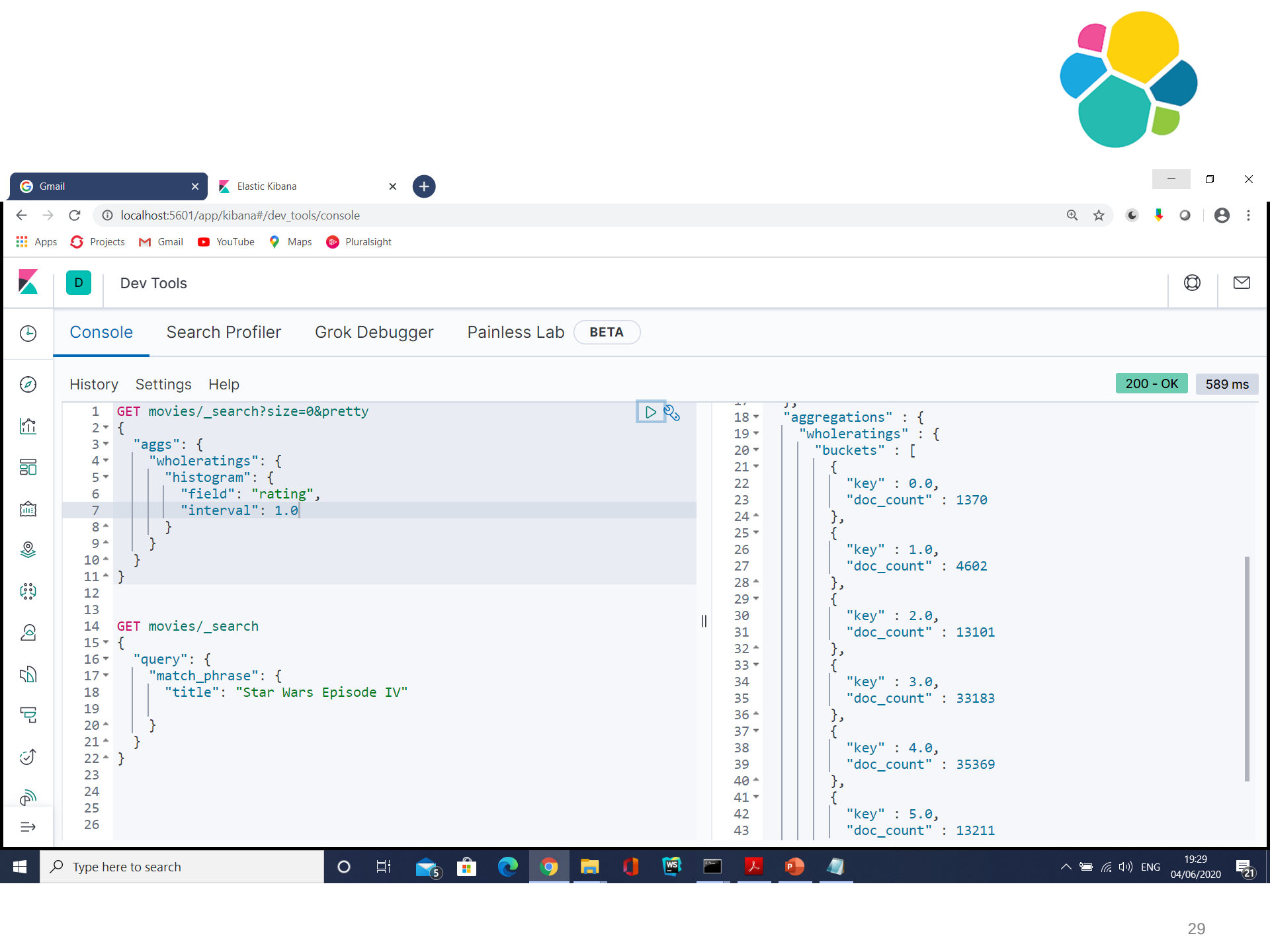
What Is A Histogram

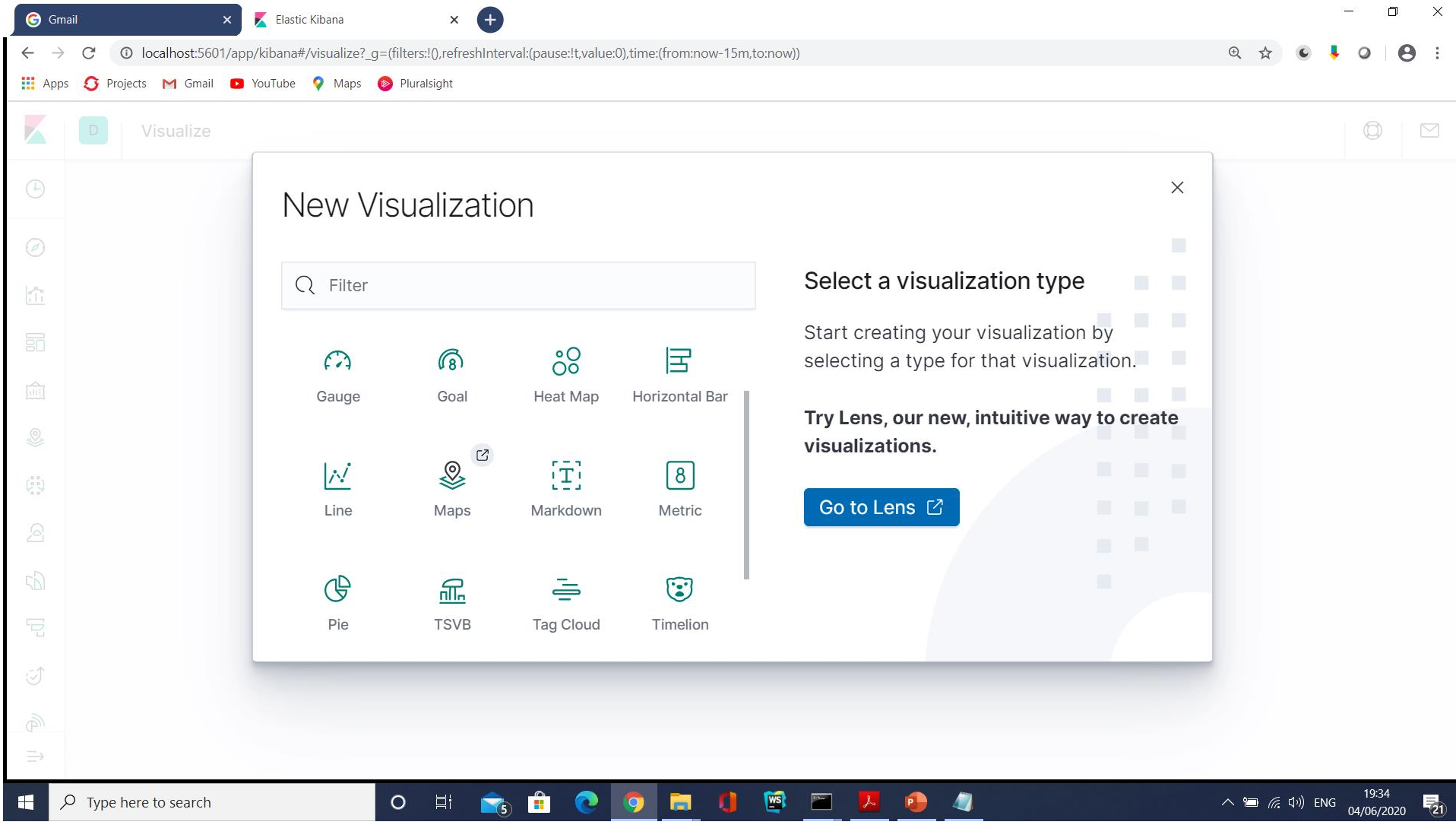
Display totals of documents bucketed by some interval range



Display Ratings By 1.0-rating Intervals

```
curl -XGET '127.0.0.1:9200/ratings/_search?size=0&pretty' -d ‘
{
    "aggs" : {
        "whole_ratings": {
            "histogram": {
                "field": "rating",
                "interval": 1.0
            }
        }
    }
}'
```


Gmail
Elastic Kibana
localhost:5601/app/kibana#/dev_tools/console
Apps
Projects
Gmail
YouTube
Maps
Pluralsight
Dev Tools
Console
Search Profiler
Grok Debugger
Painless Lab
BETA
History
Settings
Help
200 - OK
589 ms
GET movies/_search?size=0&pretty
{
"aggs": {
"wholeratings": {
"histogram": {
"field": "rating",
"interval": 1.0
}
}
}
}
GET movies/_search
{
"query": {
"match_phrase": {
"title": "Star Wars Episode IV"
}
}
}
"aggregations" : {
"wholeratings" : {
"buckets" : [
{
"key" : 0.0,
"doc_count" : 1370
},
{
"key" : 1.0,
"doc_count" : 4602
},
{
"key" : 2.0,
"doc_count" : 13101
},
{
"key" : 3.0,
"doc_count" : 33183
},
{
"key" : 4.0,
"doc_count" : 35369
},
{
"key" : 5.0,
"doc_count" : 13211
Type here to search
ENG
19:29
04/06/2020


Gmail
Elastic Kibana
localhost:5601/app/kibana#/visualize?_g=(filters:!(),refreshInterval:(pause:!t,value:0),time:(from:now-15m,to:now))
Apps
Projects
Gmail
YouTube
Maps
Pluralsight
Visualize
New Visualization
Filter
Gauge
Goal
Heat Map
Horizontal Bar
Line
Maps
Markdown
Metric
Pie
TSVB
Tag Cloud
Timelion
Select a visualization type
Start creating your visualization by selecting a type for that visualization.
Try Lens, our new, intuitive way to create visualizations.
Go to Lens
Type here to search
ENG
19:34
04/06/2020

Gmail | Elastic Kibana

localhost:5601/app/kibana#/visualize/create?indexPattern=39790950-a666-11ea-bfde-bd509f4689ee&type=metric&_g=(filters:!(),refreshInterval:(pause:!t,value:0),time:(from:now-15...

Apps | Projects | Gmail | YouTube | Maps | Pluralsight

D | Visualize / Create

Save | Share | Inspect | Refresh

Search | KQL | Off | Refresh

+ Add filter

100,836

Count

movies

Data | Options

Metrics

Metric Count

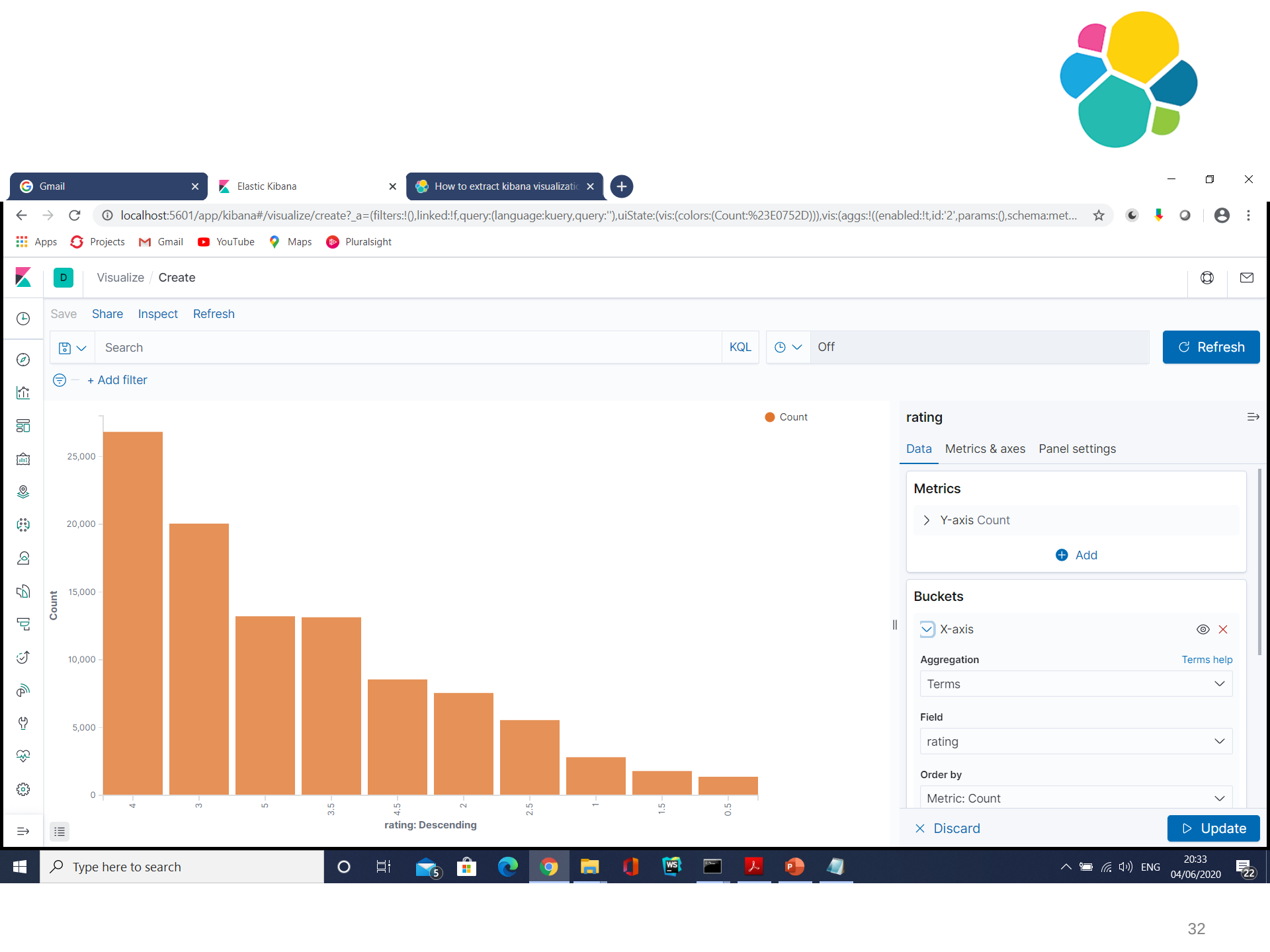
Add

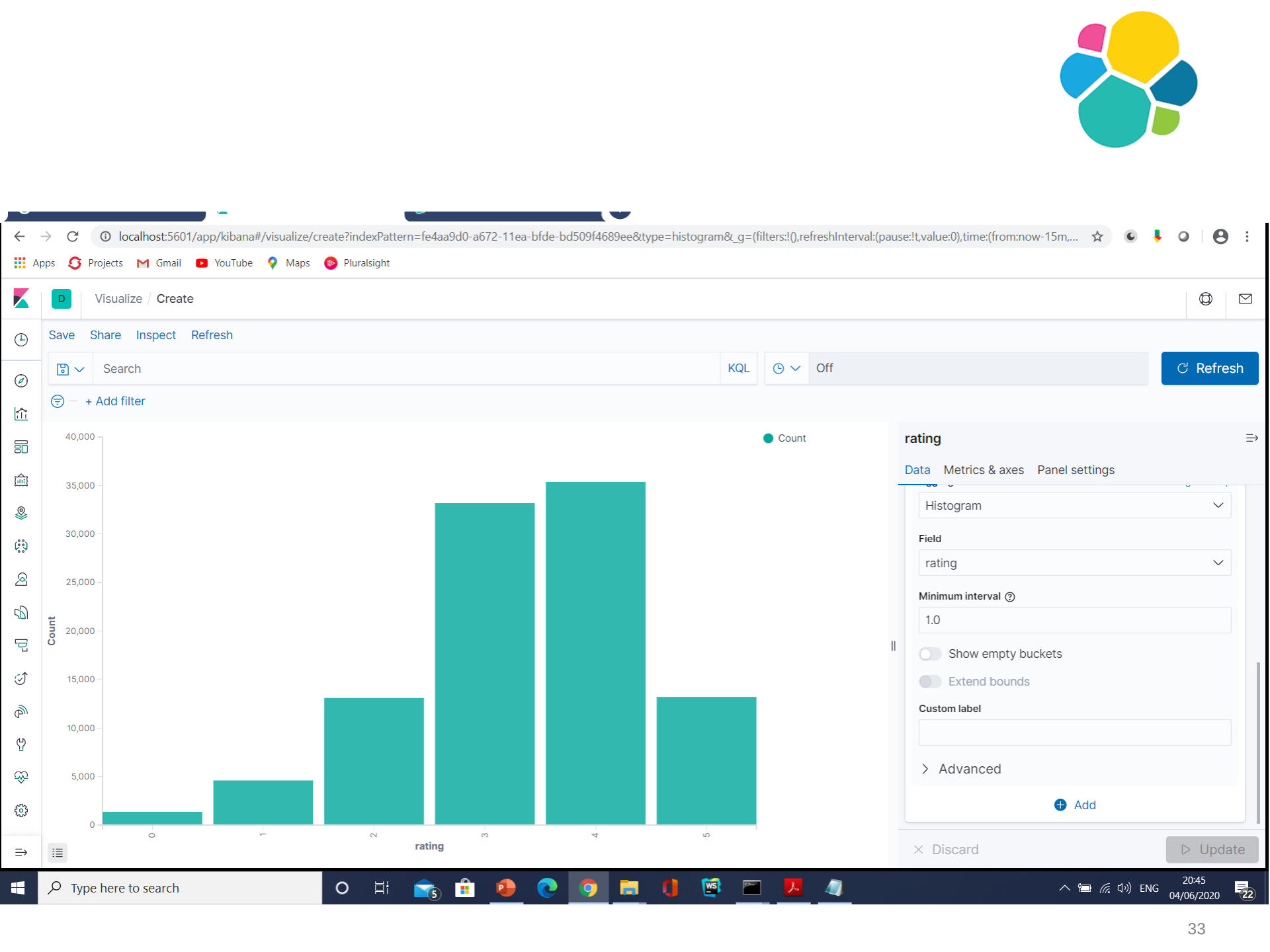
Buckets

Add

Discard | Update

Type here to search | ENG | 19:35 | 04/06/2020


Gmail
Elastic Kibana
How to extract kibana visualizatic
localhost:5601/app/kibana#/visualize/create?_a=(filters:!(),linked:!f,query:(language:kuery,query:''),uiState:(vis:(colors:(Count:%23E0752D))),vis:(aggs:!((enabled:!t,id:'2',params:(),schema:met...
Apps
Projects
Gmail
YouTube
Maps
Pluralsight
Visualize / Create
Save
Share
Inspect
Refresh
Search
KQL
Off
Refresh
+ Add filter
Count
25,000
20,000
15,000
10,000
5,000
0
Count
4
3
5
3.5
4.5
2
2.5
1
1.5
0.5
rating: Descending
rating
Data
Metrics & axes
Panel settings
Metrics
Y-axis Count
Add
Buckets
X-axis
Aggregation
Terms help
Terms
Field
rating
Order by
Metric: Count
Discard
Update
Type here to search
ENG
20:33
04/06/2020

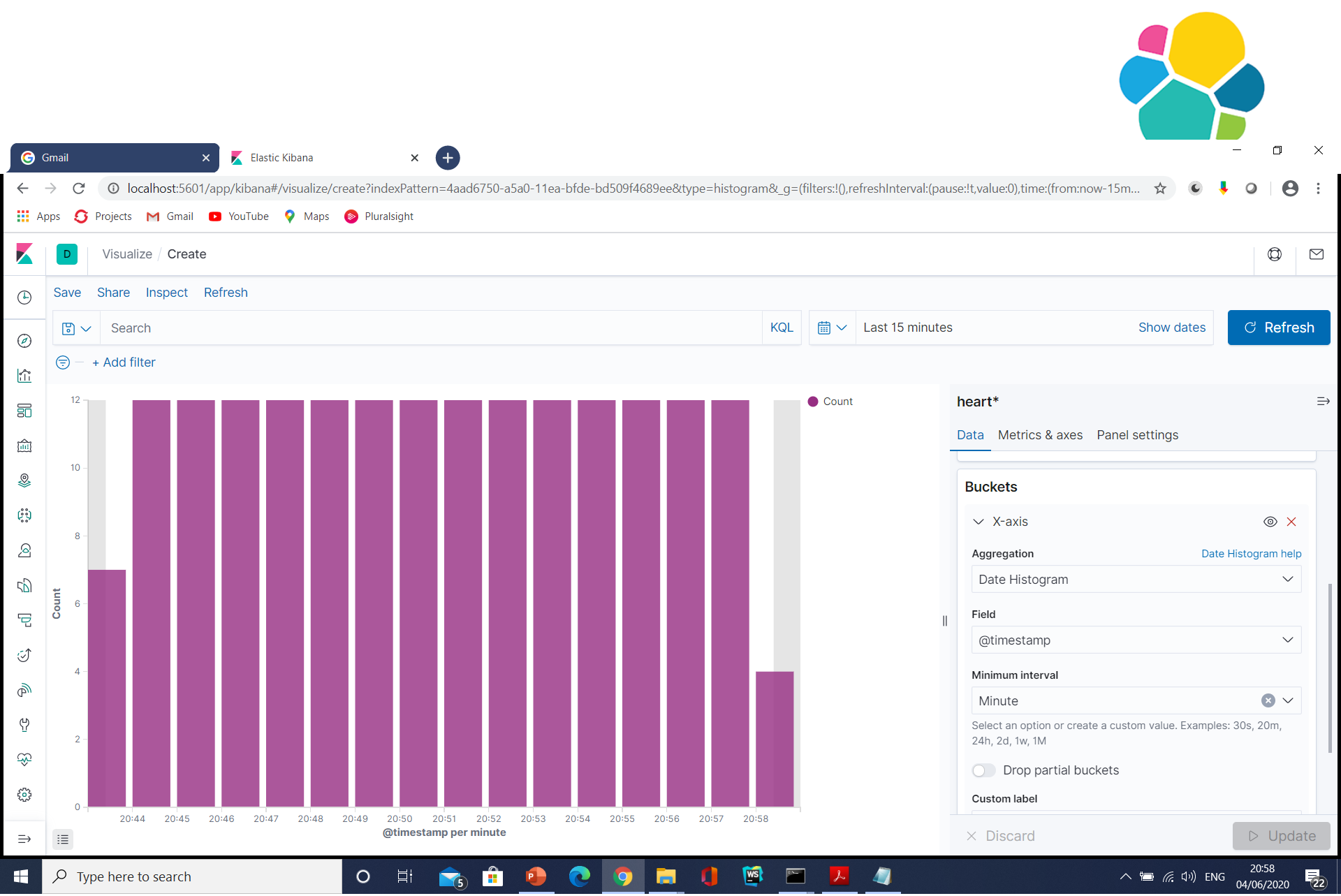

localhost:5601/app/kibana#/visualize/create?indexPattern=fe4aa9d0-a672-11ea-bfde-bd509f4689ee&type=histogram&_g=(filters:!(),refreshInterval:(pause:!t,value:0),time:(from:now-15m,...
Apps
Projects
Gmail
YouTube
Maps
Pluralsight
Visualize / Create
Save
Share
Inspect
Refresh
Search
KQL
Off
Refresh
+ Add filter
Count
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Count
0
1
2
3
4
5
rating
rating
Data
Metrics & axes
Panel settings
Histogram
Field
rating
Minimum interval
1.0
Show empty buckets
Extend bounds
Custom label
Advanced
Add
Discard
Update
Type here to search
ENG
20:45
04/06/2020

Dealing With Time

Elasticsearch can bucket and aggregate fields that contain time and dates properly. You can aggregate by “year” or “month” and it knows about calendar rules.

Break Down Website Hits By Hour:

```
curl -XGET '127.0.0.1:9200/kafka-logs/_search?size=0&pretty' -d ‘
{
    "aggs" : {
        "timestamp": {
            "date_histogram": {
                "field": "@timestamp",
                "interval": "hour"
            }
        }
    }
}'
```


Gmail
Elastic Kibana
localhost:5601/app/kibana#/visualize/create?indexPattern=4aad6750-a5a0-11ea-bfde-bd509f4689ee&type=histogram&_g=(filters:!(),refreshInterval:(pause:!t,value:0),time:(from:now-15m...
Apps
Projects
Gmail
YouTube
Maps
Pluralsight
Visualize / Create
Save
Share
Inspect
Refresh
Search
KQL
Last 15 minutes
Show dates
Refresh
+ Add filter
Count
@timestamp per minute
heart*
Data
Metrics & axes
Panel settings
Buckets
X-axis
Aggregation
Date Histogram help
Date Histogram
Field
@timestamp
Minimum interval
Minute
Select an option or create a custom value. Examples: 30s, 20m, 24h, 2d, 1w, 1M
Drop partial buckets
Custom label
Discard
Update
Type here to search
ENG
20:58
04/06/2020

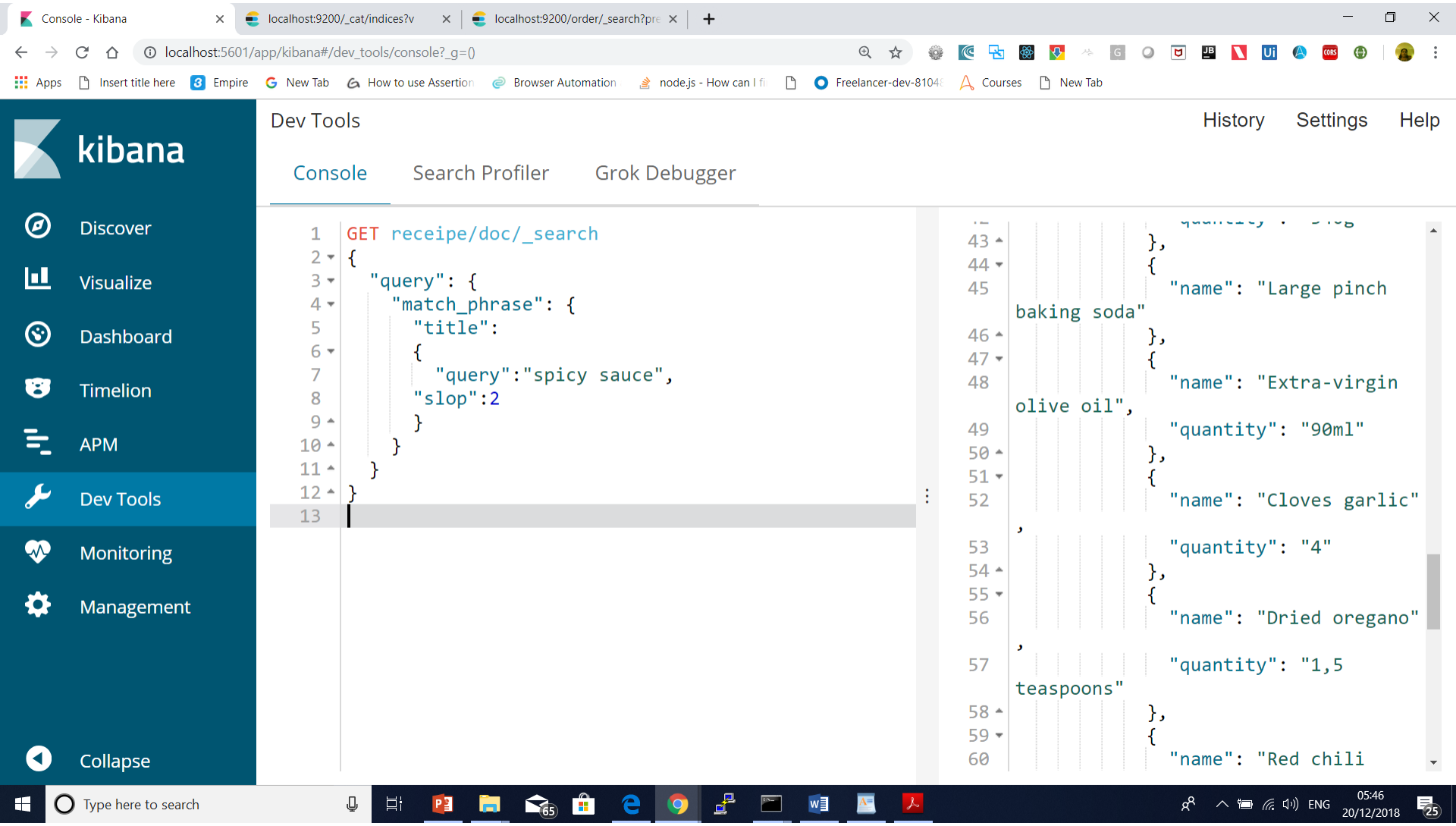
When Does Google Scrape Me?

```
curl -XGET
'127.0.0.1:9200/kafka-logs/_search?size=0&pretty' -d ‘
{
    "query" : {
        "match": {
            "agent": "Googlebot"
        }
    },
    "aggs" : {
        “timestamp": {
            "date_histogram": {
                "field": "@timestamp",
                "interval": "hour"
            }
        }
    }
}'
```

Proximity Search

	Position 1	Position 2	Position 3
Document	tomato	sauce	spicy
Query	spicy	sauce	
Slop 1	→	spicy|sauce	
Slop 2		sauce	→ spicy

Proximity Search(Order Relevance – slop)



Index Template

- An Elasticsearch index template is a method used to instruct Elasticsearch to configure indices upon creation.
- For example, an index template used on a data stream configures the stream’s backing indices upon creation.
- An index template is created manually before index creation.
- When creating an index, the template applies the configuration settings for the index.

Index Template

- Index templates define settings and mappings that you can automatically apply when creating new indices.
- Elasticsearch applies templates to new indices based on an index pattern that matches the index name.
- Index templates are only applied during index creation.
- Changes to index templates do not affect existing indices.
- Settings and mappings specified in create index API requests override any settings or mappings specified in an index template.

How can I view the current templates?

Console | Search Profiler | Grok Debugger | Painless Lab BETA

History | Settings | Help

200 - OK | 65 ms

```
258 GET _template
```

```
1  #! Elasticsearch built-in security features are not enabled. Without
   authentication, your cluster could be accessible to anyone. See https
   ://www.elastic.co/guide/en/elasticsearch/reference/7.15/security-minimal
   -setup.html to enable security.
2  {
3    ".kibana-event-log-7.15.0-template" : {
4      "order" : 0,
5      "index_patterns" : [
6        ".kibana-event-log-7.15.0-*"
7      ],
8      "settings" : {
9        "index" : {
10         "lifecycle" : {
11           "name" : "kibana-event-log-policy",
12           "rollover_alias" : ".kibana-event-log-7.15.0"
13         },
14         "number_of_shards" : "1",
15         "auto_expand_replicas" : "0-1"
16       }
```

Search for specific template

- GET _template/filebeat-*

How to Create an Index Template

```
PUT _index_template/template_1
{
  /* Define the index pattern */
  "index_patterns" : ["te*"],
  "priority" : 1,
  /* Define settings for the indices*/
  "template": {
    "settings" : {
      "number_of_shards" : 2
    }
  }
}
```

Body of Index Template

- Template: The template property (object) defines which template to be applied; it can include aliases, mappings, and settings—this an optional parameter.
- Composed_of: This property defines a list of names for component templates. Once defined, component templates get compounded in their specification order. That means the last component template defined takes the highest precedence.

Body of Index Template

- Priority: The priority property defines the precedence of the index template when creating an index. If any precedence has the highest value, it gets higher precedence compared to lower values. The priority value is not required and is of type integer. 0 is the default value for non-specified templates.
- Version: The version parameter specifies the index template version, which helps to manage the templates.

Index Template with Version

- PUT /_index_template/template_2
- {
- "index_patterns" : ["remp*", "re*"],
- "priority" : 1,
- "template": {
- "settings" : {
- "number_of_shards" : 2,
- "number_of_replicas": 0
- }
- },
- "version": 1.0
- }

Alias

- An alias is a secondary name for a group of data streams or indices.
- Most Elasticsearch APIs accept an alias in place of a data stream or index name.
- You can change the data streams or indices of an alias at any time.
- If you use aliases in your application’s Elasticsearch requests, you can reindex data with no downtime or changes to your app’s code.

Alias

- Alias types
- There are two types of aliases:
  - A data stream alias points to one or more data streams.
  - An index alias points to one or more indices.
  - An alias cannot point to both data streams and indices. You also cannot add a data stream’s backing index to an index alias.

Add Alias

```
POST _aliases
{
  "actions": [
    {
      "add": {
        "index": "logs-nginx.access-prod",
        "alias": "logs"
      }
    }
  ]
}
```

Add Alias

```
POST _aliases
{
  "actions": [
    {
      "add": {
        "index": "logs-*",
        "alias": "logs"
      }
    }
  ]
}
```

Add or Remove Alias

```
POST _aliases
{
  "actions": [
    {
      "remove": {
        "index": "logs-nginx.access-prod",
        "alias": "logs"
      }
    },
    {
      "add": {
        "index": "logs-my_app-default",
        "alias": "logs"
      }
    }
  ]
}
```

Reindexing

- Reindex is the concept of copying existing data from a source index to a destination index which can be inside the same or a different cluster.
- Elasticsearch has a dedicated endpoint _reindex for this purpose.
- A reindexing is mostly required for updating mapping or settings.

Reindexing in the same cluster

```
POST /_reindex?pretty
{
  "source": {
    "index": "news"
  },
  "dest": {
    "index": "news_v2"
  }
}
```

Reindex Steps

- Step 1
- Get all existing index data and note down the docs count of the index which is going to reindex.

- curl -X GET \
- 'http://localhost:9200/_cat/indices/%2A?v=&s=index:desc' \

Reindex Steps

- Create a new index with newly updated mapping and versioning. We shall call it companydatabase_v2
- curl -X PUT \
- http://localhost:9200/companydatabase_v2 \
- -H 'Content-Type: application/json' \
- -d '{
- "mappings": {
- "properties": {
- "FirstName": {
- "type": "text"
- },
- "Gender": {
- "type": "text"
- },
- "LastName": {
- "type": "text"
- },
- "Salary": {
- "type": "text"
- }
- }
- }
- }'

Reindex Steps

- Create a new index with newly updated mapping and versioning. We shall call it companydatabase_v2
- curl -X PUT \
- http://localhost:9200/companydatabase_v2 \
- -H 'Content-Type: application/json' \
- -d '{
- "mappings": {
- "properties": {
- "FirstName": {
- "type": "text"
- },
- "Gender": {
- "type": "text"
- },
- "LastName": {
- "type": "text"
- },
- "Salary": {
- "type": "text"
- }
- }
- }
- }'

Reindex Steps

- Step 3
- Now we shall transfer data of old index into the newly created index with _reindex command. In our case, we are transferring data from companydatabase to companydatabase_v2
- curl -X POST \
- http://localhost:9200/_reindex \
- -H 'Content-Type: application/json' \
- -d '{
- "source": {
- "index": "companydatabase"
- },
- "dest": {
- "index": "companydatabase_v2"
- }
- }'

Reindex Steps

- Step 4
- Always double-check that the newly created index should have the exact number of documents of the old index. We have 50,000 documents in our old index companydatabase which are copied to the newly created index companydatabase_v2.
- Confirm newly created index has an equal number of documents with the old index using the curl request shown below.
- curl -X GET \
- 'http://localhost:9200/companydatabase_v2/_search?scroll=10m&size=50' \
- -H 'Content-Type: application/json' \
- -d '{
- "query" : {
- "match_all" : {}
- }
- }'

Reindex Steps

- Once it is confirmed that all both the index has equal number of documents, it is safe to delete older index.
- curl -X DELETE \
- http://localhost:9200/companydatabase

Installing Elasticsearch Plugins

- Regardless of what functionalities they add, Elasticsearch plugins belong to either of the following two categories: core plugins or community plugins.
- The former is supplied as part of the Elasticsearch package and are maintained by the Elastic team.
- The latter is developed by the community and are thus separate entities with their own versioning and development cycles.

Installing Elasticsearch Plugins

- Installing core plugins is simple.
- In the example below, I'm going to install the X-Pack plugin.
- X-Pack extends Elasticsearch by plugging in Shield, Watcher, and Marvel — three plugins that prior to Elasticsearch 5.x were separate entities, each requiring separate installation and setup.

Installing Elasticsearch Plugins

- Plugins must be installed on every node in the cluster, and each node must be restarted after installation.

- Community plugins are a bit different as each of them has different installation instructions.

Elastic Snapshot and Restore

- A snapshot is a backup of a running Elasticsearch cluster.
- You can use snapshots to:
  - Regularly back up a cluster with no downtime
  - Recover data after deletion or a hardware failure
  - Transfer data between clusters
  - Reduce your storage costs by using searchable snapshots in the cold and frozen data tiers

Snapshot Workflow

- Elasticsearch stores snapshots in an off-cluster storage location called a snapshot repository.
- Before you can take or restore snapshots, you must register a snapshot repository on the cluster.
- Elasticsearch supports several repository types with cloud storage options, including:
  - AWS S3
  - Google Cloud Storage (GCS)
  - Microsoft Azure
- After you register a snapshot repository, you can use snapshot lifecycle management (SLM) to automatically take and manage snapshots.
- You can then restore a snapshot to recover or transfer its data.

Snapshots Contents

- By default, a snapshot of a cluster contains the cluster state, all regular data streams, and all regular indices. The cluster state includes:
  - Persistent cluster settings
  - Index templates
  - Legacy index templates
  - Ingest pipelines
  - ILM policies

Snapshots Contents

- You can also take snapshots of only specific data streams or indices in the cluster.
- A snapshot that includes a data stream or index automatically includes its aliases.
- When you restore a snapshot, you can choose whether to restore these aliases.
- Snapshots don’t contain or back up:
  - Transient cluster settings
  - Registered snapshot repositories
  - Node configuration files
  - Security configuration files

Create Snapshot

```
PUT /_snapshot/backup_repo
{
  "type": "fs",
  "settings": {
    "location": "/home/root/backups",
    "compress": true
  }
}
```

Create Snapshot

- curl -XPUT "http://localhost:9200/_snapshot/backup_repo" -H 'Content-Type: application/json' -d'{ "type": "fs", "settings": {   "location": "/home/root/backups", "compress": true }}'

How to View the Snapshot Repository

- To confirm the successful creation of the snapshot repository, use the GET request with the _snapshot endpoint as:
- GET /_snapshot/backup_repo
- You can also use the following cURL command:
- curl -XGET "http://localhost:9200/_snapshot/backup_repo"

How to Create an Elasticsearch Snapshot

- Creating an Elasticsearch snapshot for a specific snapshot repository is handled by the create snapshot API.
- The API requires the snapshot repository name and the name of the snapshot.
- NOTE: A single snapshot repository can have more than one snapshot of the same clusters as long as they have unique identities/names.
- Consider the following request to add a snapshot called snapshot_2021 to the backup_repo repository.
  - PUT /_snapshot/backup_repo/snapshot_2021
- To use cURL, use the command:
  - curl -XPUT "http://localhost:9200/_snapshot/backup_repo/snapshot_2021"

How to Create an Elasticsearch Snapshot

- Consider the following request that backups the .kibana index (a system index) and specifies which user authorized the snapshot and the reason.

- PUT /_snapshot/backup_repo/snapshot_2
- {
- "indices": ".kibana",
- "ignore_unavailable": true,
- "include_global_state": true,
- "metadata": {
- "taken_by": "elasticadmin",
- “taken_because”: “Daily Backup”
- }
- }

How to View Snapshots

- All you need to pass in the request is the snapshot repository and the name of the snapshot you wish to view the details.
- The snapshot should respond with details about a specified snapshot. These details include:
  - Start and end time values
  - The version of Elasticsearch that created the snapshot
  - List of included indices
  - The snapshot's current state
  - List of failures that occurred during the snapshot

How to View Snapshots

- GET /_snapshot/backup_repo/snapshot_3

- To use cURL, use the command below:

- [cc lang="text" width="100%" height="100%" escaped="true" theme="blackboard" nowrap="0"]
- curl -XGET “http://localhost:9200/_snapshot/backup_repo/snapshot_3”

Restore Snapshot

- To restore the whole snapshot:

- POST /_snapshot/my_backup/snapshot-01-11-2019/_restore

- To restore an individual index:

- POST /_snapshot/my_backup/snapshot-01-11-2019/_restore
- {
- "indices": "my_index"
- }

Improve Performance

- Size parameter
- Assigning a huge value to size parameter causes Elasticsearch to compute vast amounts of hits, which causes severe performance issues. Instead of setting a huge size, you should batch requests in small sizes.

- Shards and replicas
- Optimize necessary index settings that play a crucial role in Elasticsearch performance, like the number of shards and replicas. In many cases having more replicas helps improve search performance.

Improve Performance

- Deleted documents
- Having many deleted documents in the Elasticsearch index also causes search performance issues.
- Force merge API can be used to remove many deleted documents and optimize the shards.
- Search filters
- Effective use of filters in Elasticsearch queries can improve search performance dramatically as the filter clauses are 1) cached, and 2) able to reduce the target documents to be searched in the query clause.

Improve Performance

- Wildcard queries
  - Avoid wildcard, especially leading wildcard queries, which causes the entire Elasticsearch index to be scanned.
  - Regex and parent-child
  - Note that Regex queries and parent-child can cause search latency.
- Implementing features
  - There are multiple ways to implement a specific feature in Elasticsearch.
  - For example, Autocomplete can be implemented in various styles.
  - Opster's blog gives a 360-degree view of both functional and non-functional features (especially performance).

Improve Performance

- Multitude of small shards
  - Having many small shards could cause a lot of network calls and threads, which severely impact search performance;
- Heavy aggregations
  - Avoid heavy aggregations that involve unique IDs. Refer to Opster's slow logs guide to identify such search slow logs effectively.
- Timeout and terminate
  - Timeout param and terminate after param can be useful when executing heavy searches, or when result data is vast.

Improve Performance

- Search templates
  - Use search templates to achieve better abstraction, meaning without exposing your query syntax to your users.
  - Search templates also help you transfer less data over the network, which is particularly useful when you have large Elasticsearch queries.
- Multi search API
  - Use msearch whenever possible. In most of the applications it’s required to query multiple Elasticsearch indices for a single transaction, and sometimes users do so in a serial order even when it’s not required.
  - In both cases, when you need to query multiple indices for the same transaction and when the result of these queries are independent, you should always use msearch to execute the queries in parallel in Elasticsearch.

Improve Performance

- Term queries
  - Use term query when you need an exact match and on keywords fields.
  - By default, Elasticsearch generates both text and keyword fields for every field that consists of a string value if explicit mapping is not supplied.
  - Users tend to use the match query even on keyword data types like product-ids, which is costly as match query goes through an analysis operation.

Improve Performance

- Source filtering
  - _source filtering is a great way to improve the performance of Elasticsearch queries when retrieving many documents or documents of large sizes.
  - By default, Elasticsearch returns the complete source of matching documents.
  - If you don’t need _source at all or need only values of specific fields, you can achieve this with _source filtering.

Mixing exact search with stemming

- When building a search application, stemming is often a must as it is desirable for a query on skiing to match documents that contain ski or skis.
- Example stemming.txt

Consistent Scoring

- The fact that Elasticsearch operates with shards and replicas adds challenges when it comes to having good scoring.
- Say the same user runs the same request twice in a row and documents do not come back in the same order both times.
- Unfortunately, this is something that can happen if you have replicas (index.number_of_replicas is greater than 0).
- The reason is that Elasticsearch selects the shards that the query should go to in a round-robin fashion.
- So, it is quite likely if you run the same query twice in a row that it will go to different copies of the same shard.

Consistent Scoring

- Index statistics are an important part of the score.
- And these index statistics may be different across copies of the same shard due to deleted documents.
- When documents are deleted or updated, the old document is not immediately removed from the index.
- It is just marked as deleted and it will only be removed from disk on the next time that the segment this old document belongs to is merged.
- Those deleted documents are taken into account for index statistics.
- So, imagine that the primary shard just finished a large merge that removed lots of deleted documents, then it might have index statistics that are sufficiently different from the replica (which still have plenty of deleted documents) so that scores are different too.

Consistent Scoring

- The recommended way to work around this issue is to use a string that identifies the user that is logged in (a user id or session id for instance) as a preference.
- This ensures that all queries of a given user are always going to hit the same shards, so scores remain more consistent across queries.
- This work around has another benefit: when two documents have the same score, they will be sorted by their internal Lucene doc id (which is unrelated to the _id) by default.
- However, these doc ids could be different across copies of the same shard.
- So, by always hitting the same shard, we would get more consistent ordering of documents that have the same scores.

Tune Indexing Speed

- Use bulk requests
- Bulk requests will yield much better performance than single-document index requests.
- In order to know the optimal size of a bulk request, you should run a benchmark on a single node with a single shard.
- First try to index 100 documents at once, then 200, then 400, etc. doubling the number of documents in a bulk request in every benchmark run.

Tune Indexing Speed

- Use bulk requests
- When the indexing speed starts to plateau then you know you reached the optimal size of a bulk request for your data.
- In case of tie, it is better to err in the direction of too few rather than too many documents.

Tune Indexing Speed

- Use multiple workers/threads to send data to Elasticsearchedit
- A single thread sending bulk requests is unlikely to be able to max out the indexing capacity of an Elasticsearch cluster.
- In order to use all resources of the cluster, you should send data from multiple threads or processes.
- In addition to making better use of the resources of the cluster, this should help reduce the cost of each fsync.

Tune Indexing Speed

- Unset or increase the refresh interval
- The operation that consists of making changes visible to search - called a refresh - is costly, and calling it often while there is ongoing indexing activity can hurt indexing speed.
- By default, Elasticsearch periodically refreshes indices every second, but only on indices that have received one search request or more in the last 30 seconds.

Tune Indexing Speed

- Disable replicas for initial loads
- If you have a large amount of data that you want to load all at once into Elasticsearch, it may be beneficial to set index.number_of_replicas to 0 in order to speed up indexing.
- Having no replicas means that losing a single node may incur data loss, so it is important that the data lives elsewhere so that this initial load can be retried in case of an issue.
- Once the initial load is finished, you can set index.number_of_replicas back to its original value.

Tune Indexing Speed

- Disable swapping
- You should make sure that the operating system is not swapping out the java process by disabling

Tune Indexing Speed

- Give memory to the filesystem cacheedit
- The filesystem cache will be used in order to buffer I/O operations.
- You should make sure to give at least half the memory of the machine running Elasticsearch to the filesystem cache.

Tune Indexing Speed

- Use auto-generated ids
- When indexing a document that has an explicit id, Elasticsearch needs to check whether a document with the same id already exists within the same shard, which is a costly operation and gets even more costly as the index grows.
- By using auto-generated ids, Elasticsearch can skip this check, which makes indexing faster.

Tune Indexing Speed

- Use faster hardware
- If indexing is I/O-bound, consider increasing the size of the filesystem cache (see above) or using faster storage.
- Elasticsearch generally creates individual files with sequential writes.
- However, indexing involves writing multiple files concurrently, and a mix of random and sequential reads too, so SSD drives tend to perform better than spinning disks.

Tune Indexing Speed

- Directly-attached (local) storage generally performs better than remote storage because it is simpler to configure well and avoids communications overheads.
- With careful tuning it is sometimes possible to achieve acceptable performance using remote storage too.
- Benchmark your system with a realistic workload to determine the effects of any tuning parameters.
- If you cannot achieve the performance you expect, work with the vendor of your storage system to identify the problem.

Tune Indexing Speed

- Indexing buffer size
- If your node is doing only heavy indexing, be sure indices.memory.index_buffer_size is large enough to give at most 512 MB indexing buffer per shard doing heavy indexing (beyond that indexing performance does not typically improve).
- Elasticsearch takes that setting (a percentage of the java heap or an absolute byte-size) and uses it as a shared buffer across all active shards.
- Very active shards will naturally use this buffer more than shards that are performing lightweight indexing.
- The default is 10% which is often plenty: for example, if you give the JVM 10GB of memory, it will give 1GB to the index buffer, which is enough to host two shards that are heavily indexing.

Exploring Kibana

- Kibana is the front end for Elasticsearch and provides delightful visualizations for data.
- Kibana is an open source analytics engine that can be used to search, view, and analyze data.
- Various kinds of visualizations are available to illustrate data in the form of tables, charts, histograms, maps, etc.
- There is a web-based interface to handle large volumes of data.
- Creating a dashboard is quite seamless and queries data in real time. Essentially, a dashboard is nothing but a way for analyzing JSON documents.
- You can save them, make them as templates, or simply export them.
- The ease of setup and use will help you cut through the complexities of stored data in minutes.

Exploring Kibana

- Kibana comes as an Apache-licensed product.
- Its flexible interface comes out as a great combination for Elasticsearch's searching capabilities.
- You only need a web server and any modern web browser to start working with Kibana.
- It leverages the REST APIs of Elasticsearch.
- Data can be visualized in real time by using dashboards.
- This helps in getting real-time insights.

Exploring Kibana

- **Emphasis on search terms**: The list of documents returned as the response to a search contains the search terms as highlighted.
- **Aggregations**: In-depth use of Elasticsearch aggregations is done to facilitate visualizations. Buckets return a set of documents meeting criteria like terms, range, histogram, etc. Metrics, on the other hand, compute statistics like min, max, sum, or average for a set of documents.
- **Scripted fields**: Scripted fields help with computations in real time on indexed data. For example, for a certain field you want to add 500 before showing it. This can be saved as a scripted field. There is a caveat, though: scripted fields cannot be searched.

Exploring Kibana

Dynamic dashboards: Kibana dashboards are flexible and dynamic, allowing for individual visualizations to be conveniently arranged. Moreover, they enable automatic refreshing of data.

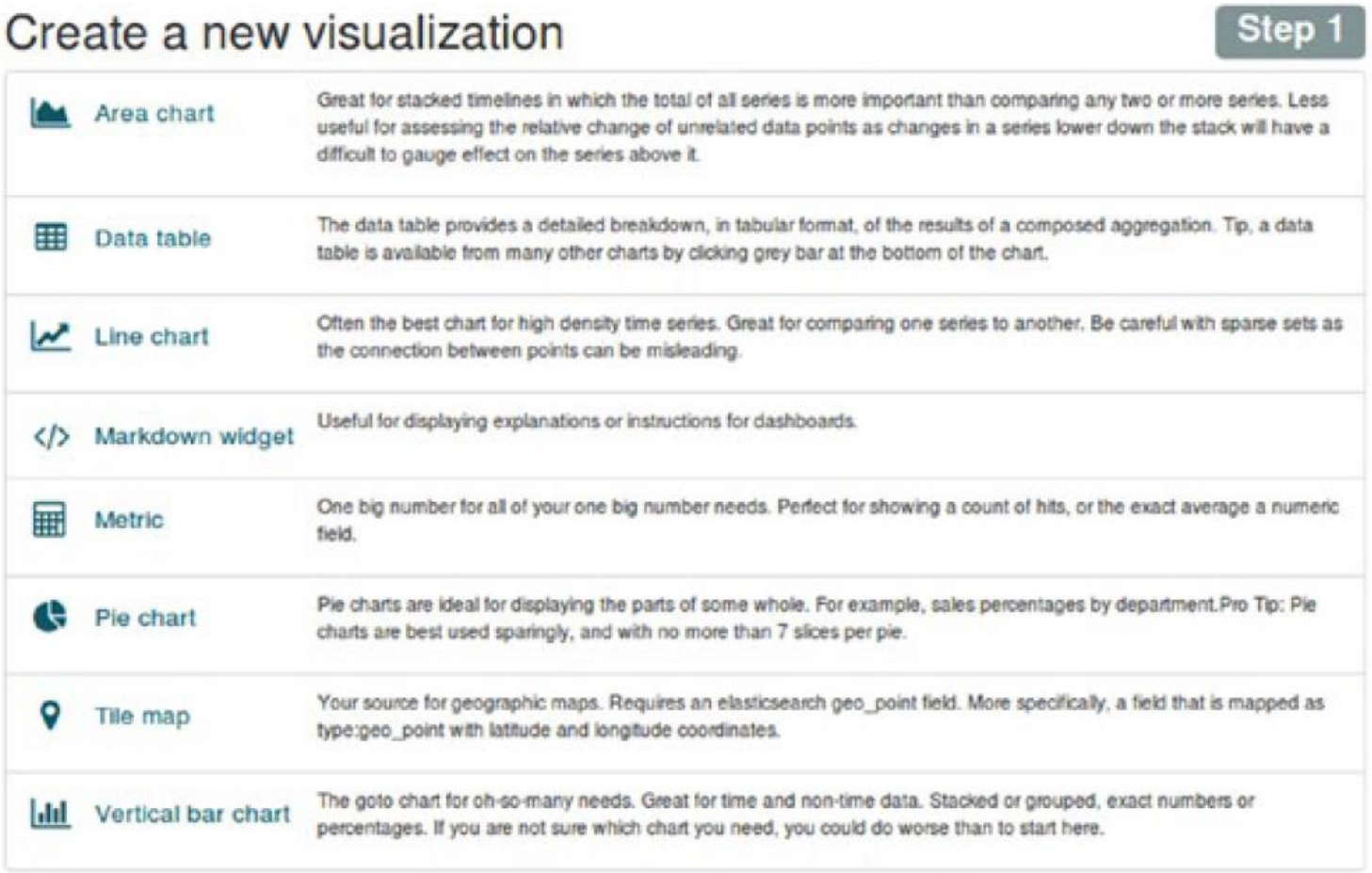
Kibana User Interface

- The Kibana user interface consists of four main tabs:
- 1. **Discover**: This page is used for search based on free form text, fields, or ranges.
- 2. **Visualize**: As the name suggests, this page provides the facility for creating multiple visualizations like bar charts, pie charts, line charts, etc. These charts can be saved for use in dashboards later.

Kibana User Interface

- **Dashboard**: This page is a set of collections of multiple visualizations and searches. It allows for easy application of filters based on click interaction, which helps in drawing conclusions based on multiple data aggregations.
- 4. **Settings**: The settings page is used to configure kibana operational parameters. Some of the examples are index patterns, scripted fields, data types of fields, etc.

Kibana - Data Visualization



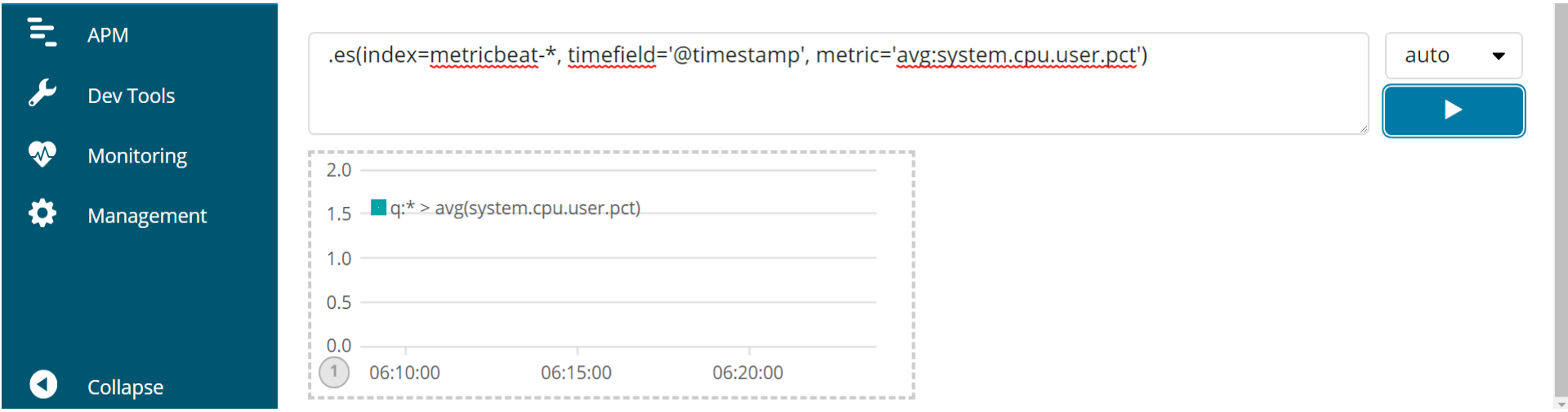
Timelion

- Timelion is a time series data visualizer that enables you to combine totally independent data sources within a single visualization.
- It’s driven by a simple expression language you use to retrieve time series data, perform calculations to tease out the answers to complex questions, and visualize the results.

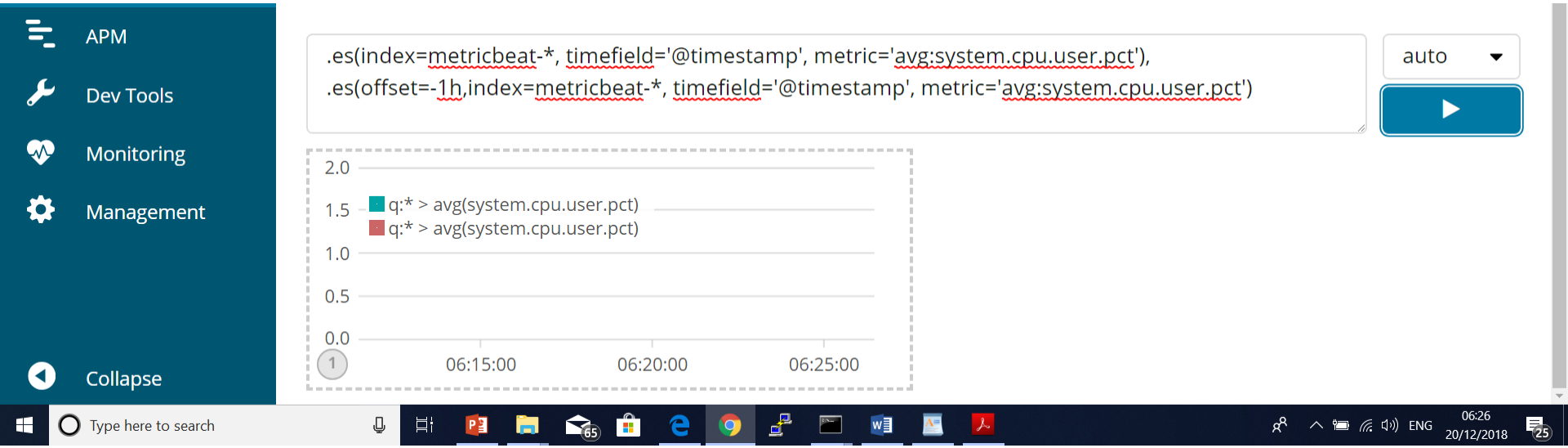
Timelion

- How many pages does each unique user view over time?
- What's the difference in traffic volume between this Friday and last Friday?
- What percent of Japan's population came to my site today?
- What's the 10-day moving average of the S&P 500?
- What's the cumulative sum of all search requests received in the last 2 years?

Timelion


APM
Dev Tools
Monitoring
Management
Collapse
.es(index=metricbeat-*, timefield='@timestamp', metric='avg:system.cpu.user.pct')
auto
2.0
1.5
1.0
0.5
0.0
q:* > avg(system.cpu.user.pct)
1
06:10:00
06:15:00
06:20:00

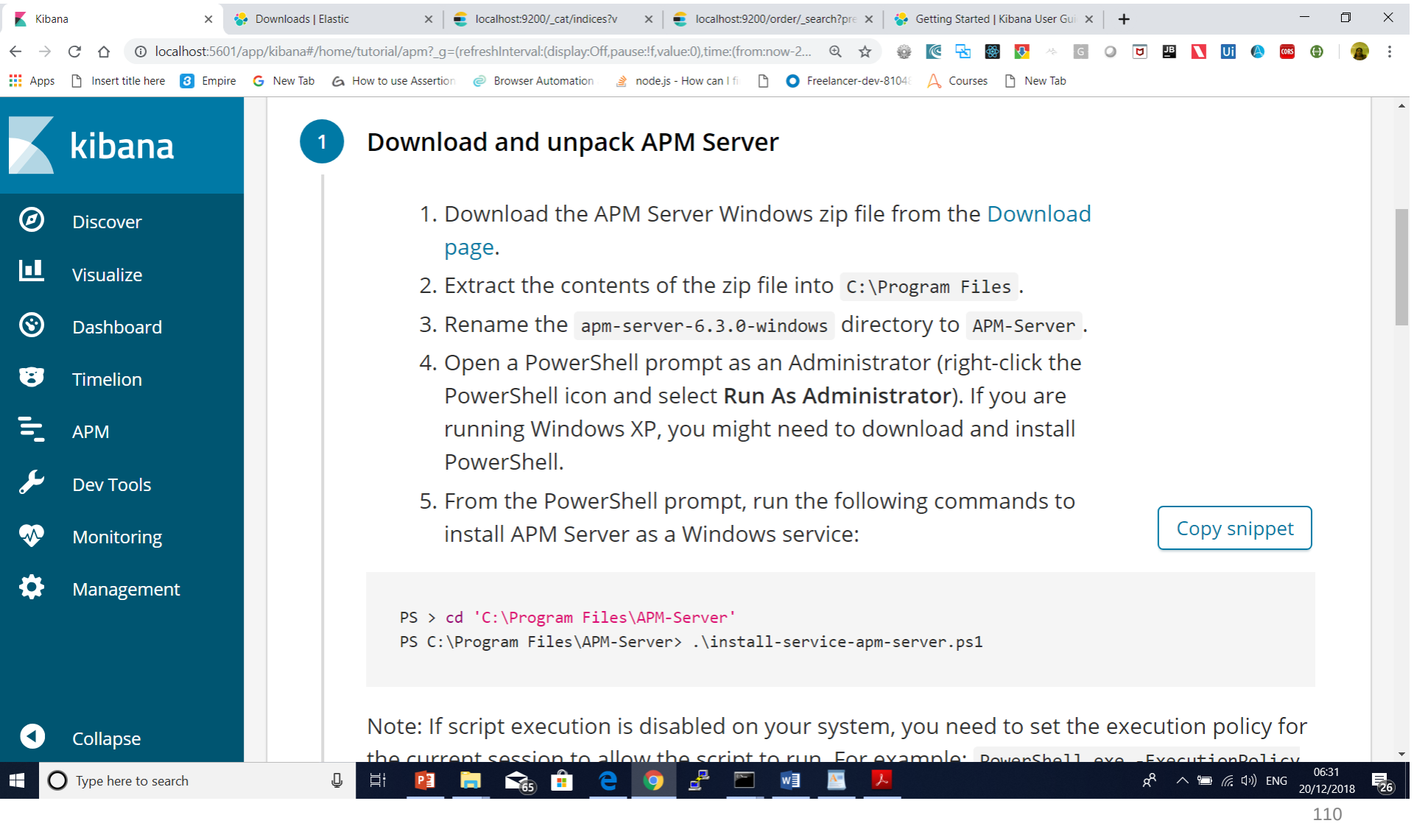
Timelion


APM
Dev Tools
Monitoring
Management
Collapse
.es(index=metricbeat-*, timefield='@timestamp', metric='avg:system.cpu.user.pct'),
.es(offset=-1h,index=metricbeat-*, timefield='@timestamp', metric='avg:system.cpu.user.pct')
auto
2.0
1.5
1.0
0.5
0.0
q:* > avg(system.cpu.user.pct)
q:* > avg(system.cpu.user.pct)
06:15:00
06:20:00
06:25:00
Type here to search
ENG
06:26
20/12/2018

APM

- Elastic Application Performance Monitoring (APM) automatically collects in-depth performance metrics and errors from inside your applications.
- The **APM** page in Kibana is provided with the X-Pack basic license. It enables developers to drill down into the performance data for their applications and quickly locate the performance bottlenecks.

APM

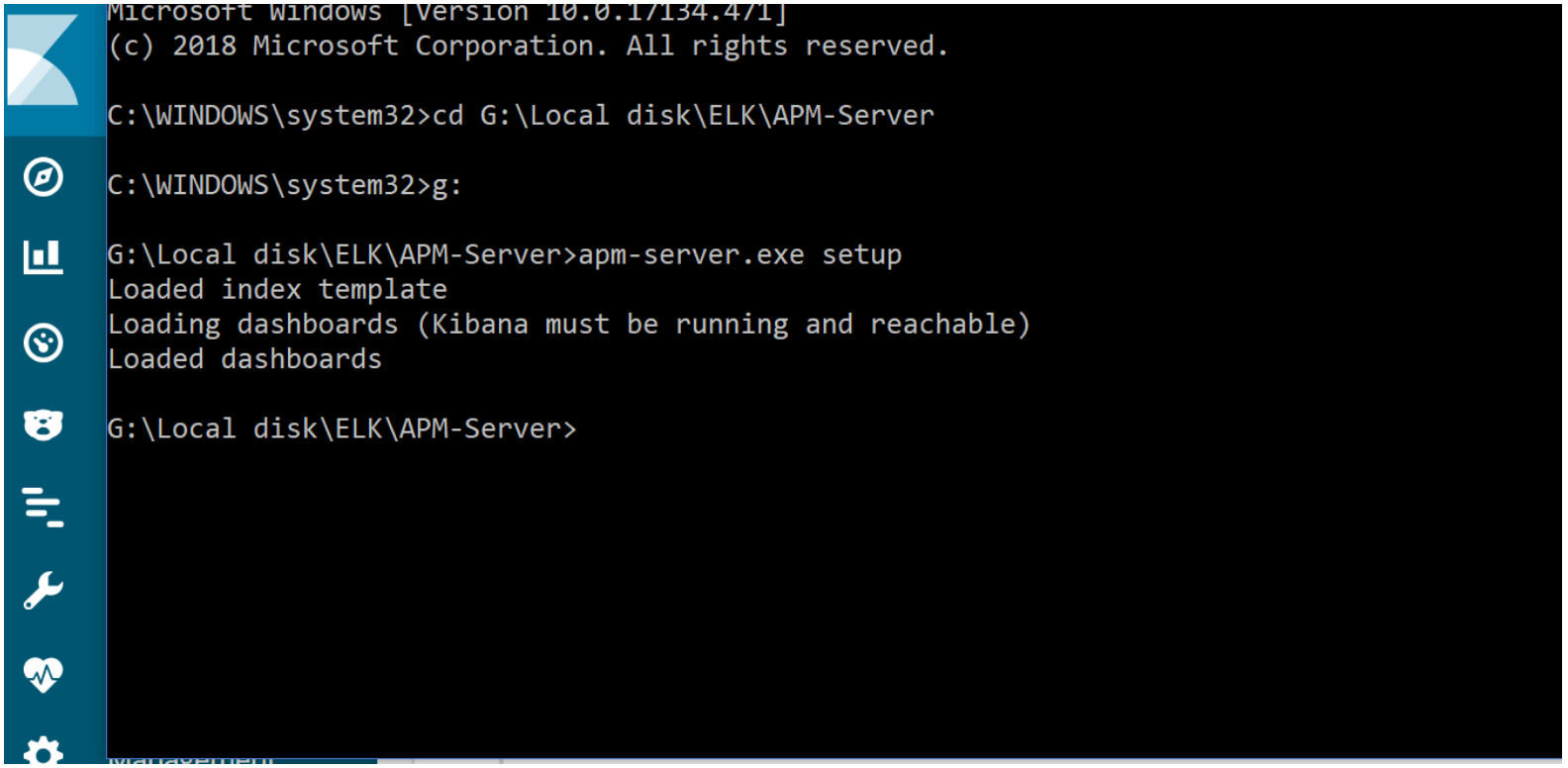

Kibana
Downloads | Elastic
localhost:9200/_cat/indices?v
localhost:9200/order/_search?pre
Getting Started | Kibana User Gui
localhost:5601/app/kibana#/home/tutorial/apm?_g=(refreshInterval:(display:Off,pause:!f,value:0),time:(from:now-2...
Apps
Insert title here
Empire
New Tab
How to use Assertion
Browser Automation
node.js - How can I fi
Freelancer-dev-8104
Courses
New Tab
kibana
Discover
Visualize
Dashboard
Timelion
APM
Dev Tools
Monitoring
Management
Collapse
1
Download and unpack APM Server
1. Download the APM Server Windows zip file from the Download page.
2. Extract the contents of the zip file into C:\Program Files.
3. Rename the apm-server-6.3.0-windows directory to APM-Server.
4. Open a PowerShell prompt as an Administrator (right-click the PowerShell icon and select Run As Administrator). If you are running Windows XP, you might need to download and install PowerShell.
5. From the PowerShell prompt, run the following commands to install APM Server as a Windows service:
Copy snippet
PS > cd 'C:\Program Files\APM-Server'
PS C:\Program Files\APM-Server> .\install-service-apm-server.ps1
Note: If script execution is disabled on your system, you need to set the execution policy for
Type here to search
ENG
06:31
20/12/2018

APM

Set-ExecutionPolicy -ExecutionPolicy bypass

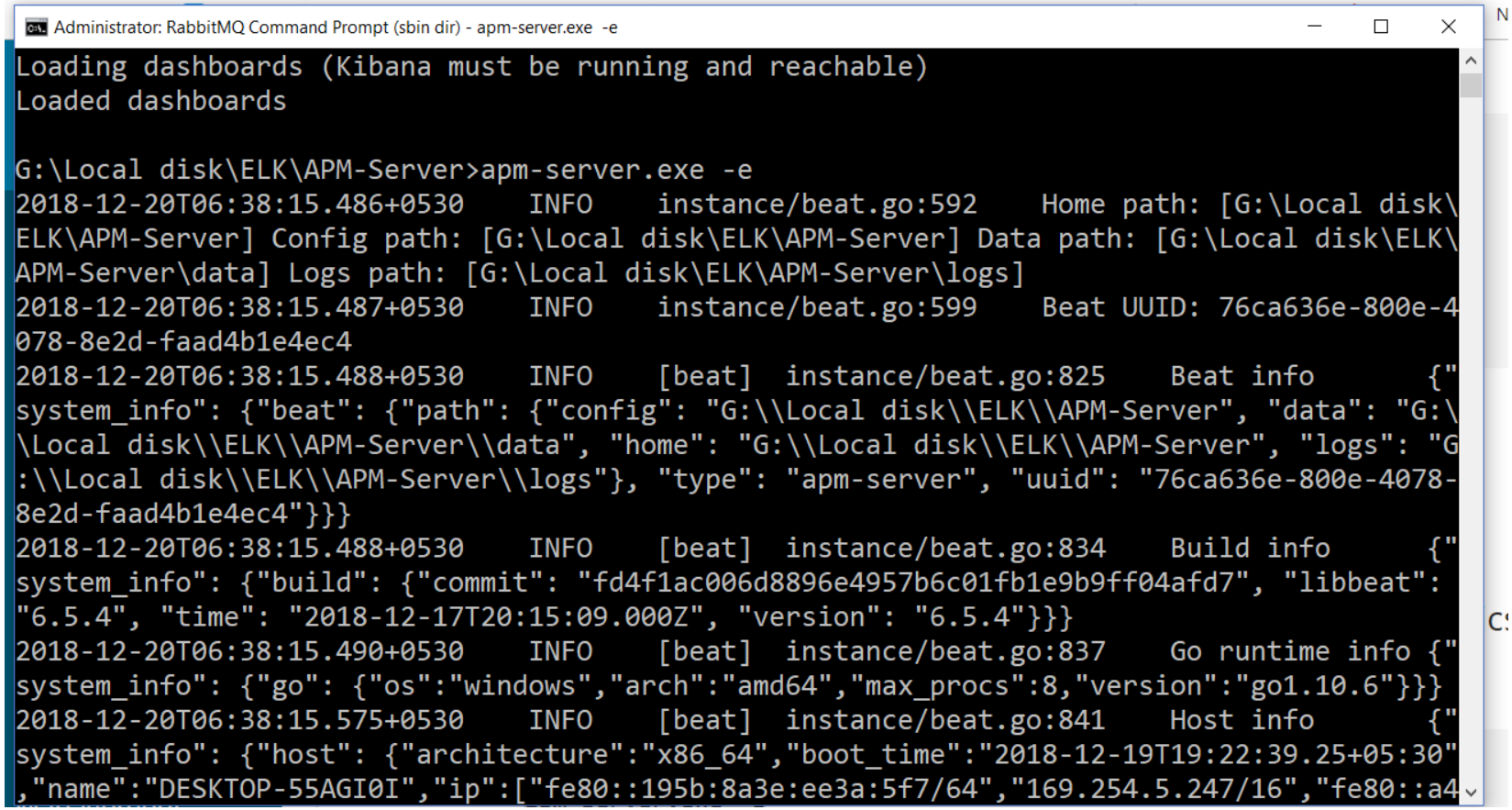
```
PS G:\Local disk\ELK\APM-Server> .\install-service-apm-server.ps1


__GENUS          : 2
__CLASS          : __PARAMETERS
__SUPERCLASS     :
__DYNASTY        : __PARAMETERS
__RELPATH        :
__PROPERTY_COUNT : 1
__DERIVATION     : {}
__SERVER         :
__NAMESPACE      :
__PATH           :
ReturnValue      : 5
PSComputerName   :

__GENUS          : 2
__CLASS          : __PARAMETERS
__SUPERCLASS     :
__DYNASTY        : __PARAMETERS
__RELPATH        :
__PROPERTY_COUNT : 1
__DERIVATION     : {}
__SERVER         :
__NAMESPACE      :
__PATH           :
ReturnValue      : 0
```

APM


Microsoft Windows [Version 10.0.17134.471]
(c) 2018 Microsoft Corporation. All rights reserved.
C:\WINDOWS\system32>cd G:\Local disk\ELK\APM-Server
C:\WINDOWS\system32>g:
G:\Local disk\ELK\APM-Server>apm-server.exe setup
Loaded index template
Loading dashboards (Kibana must be running and reachable)
Loaded dashboards
G:\Local disk\ELK\APM-Server>

APM

```
./apm-server -e -E output.elasticsearch.hosts=localhost:9200 -E apm-server.host=localhost:8200
```



APM java

- refer ericmsjuly2021
- ==========

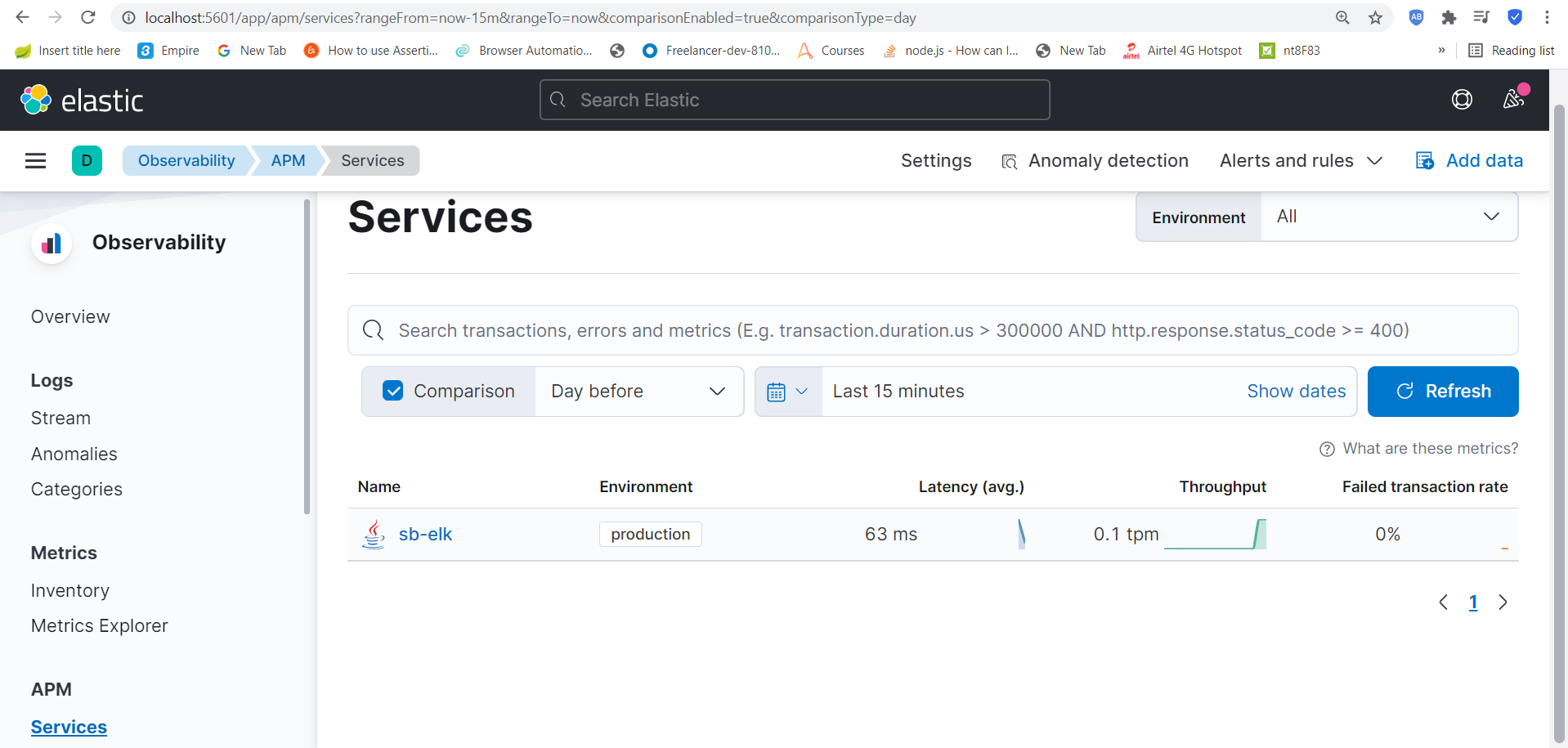
- java -javaagent:"D:\ELK\apm-server-7.15.0-windows-x86_64elastic-apm-agent-1.26.0.jar" \
- -Delastic.apm.service_name=sb-elk \
- -Delastic.apm.server_urls=http://localhost:8200 \
- -Delastic.apm.secret_token= \
- -Delastic.apm.environment=production \
- -Delastic.apm.application_packages=com.dell \
- -jar spring-boot-elk-0.0.1-SNAPSHOT.jar

APM java

Administrator: Command Prompt - java -javaagent:"D:\ELK\apm-server-7.15.0-windows-x86_64\elastic-apm-agent-1.26.0.jar" -Delastic.apm.service_name=sb-elk -Delastic.apm.server_urls=http://localhost:8200 -Delastic.apm.secret_token= -Delastic.apm.envir...

```
F:\ericjulyms2021\spring-boot-elk\target>java -javaagent:elastic-apm-agent-1.26.0.jar -Delastic.apm.service_name=sb-elk -Delastic.apm.s
erver_urls=http://localhost:8200 -Delastic.apm.secret_token= -Delastic.apm.environment=production -Delastic.apm.application_packages=co
m.dell -jar spring-boot-elk-0.0.1-SNAPSHOT.jar
Error opening zip file or JAR manifest missing : elastic-apm-agent-1.26.0.jar
Error occurred during initialization of VM
agent library failed to init: instrument

F:\ericjulyms2021\spring-boot-elk\target>java -javaagent:"D:\ELK\apm-server-7.15.0-windows-x86_64\elastic-apm-agent-1.26.0.jar" -Delast
ic.apm.service_name=sb-elk -Delastic.apm.server_urls=http://localhost:8200 -Delastic.apm.secret_token= -Delastic.apm.environment=produc
tion -Delastic.apm.application_packages=com.dell -jar spring-boot-elk-0.0.1-SNAPSHOT.jar
2021-09-29 20:24:24,363 [main] INFO  co.elastic.apm.agent.util.JmxUtils - Found JVM-specific OperatingSystemMXBean interface: com.sun.m
anagement.OperatingSystemMXBean
2021-09-29 20:24:24,377 [main] INFO  co.elastic.apm.agent.configuration.StartupInfo - Starting Elastic APM 1.26.0 as sb-elk on Java 1.8
.0_251 Runtime version: 1.8.0_251-b08 VM version: 25.251-b08 (Oracle Corporation) Windows 10 10.0
2021-09-29 20:24:24,377 [main] INFO  co.elastic.apm.agent.configuration.StartupInfo - service_name: 'sb-elk' (source: Java System Prope
rties)
2021-09-29 20:24:24,378 [main] INFO  co.elastic.apm.agent.configuration.StartupInfo - environment: 'production' (source: Java System Pr
operties)
2021-09-29 20:24:24,378 [main] INFO  co.elastic.apm.agent.configuration.StartupInfo - secret_token: 'XXXX' (source: Java System Propert
ies)
2021-09-29 20:24:24,378 [main] INFO  co.elastic.apm.agent.configuration.StartupInfo - server_urls: 'http://localhost:8200' (source: Jav
a System Properties)
2021-09-29 20:24:24,379 [main] INFO  co.elastic.apm.agent.configuration.StartupInfo - application_packages: 'com.dell' (source: Java Sy
stem Properties)
2021-09-29 20:24:28,459 [elastic-apm-server-healthcheck] INFO  co.elastic.apm.agent.report.ApmServerHealthChecker - Elastic APM server
is available: {  "build_date": "2021-09-16T01:57:32Z",  "build_sha": "a183f675ecd03fca4a897cbe85fda3511bc3ca43",  "version": "7.15.0"}
2021-09-29 20:24:28,785 [main] INFO  co.elastic.apm.agent.impl.ElasticApmTracer - Tracer switched to RUNNING state


  .   ____          _            __ _ _
 /\\ / ___'_ __ _ _(_)_ __  __ _ \ \ \ \
( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
 \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
```

APM java


localhost:5601/app/apm/services?rangeFrom=now-15m&rangeTo=now&comparisonEnabled=true&comparisonType=day
Insert title here
Empire
New Tab
How to use Asserti...
Browser Automatio...
Freelancer-dev-810...
Courses
node.js - How can I...
New Tab
Airtel 4G Hotspot
nt8F83
Reading list
elastic
Search Elastic
D
Observability
APM
Services
Settings
Anomaly detection
Alerts and rules
Add data
Observability
Overview
Logs
Stream
Anomalies
Categories
Metrics
Inventory
Metrics Explorer
APM
Services
Services
Environment
All
Search transactions, errors and metrics (E.g. transaction.duration.us > 300000 AND http.response.status_code >= 400)
Comparison
Day before
Last 15 minutes
Show dates
Refresh
What are these metrics?
Name
Environment
Latency (avg.)
Throughput
Failed transaction rate
sb-elk
production
63 ms
0.1 tpm
0%
1

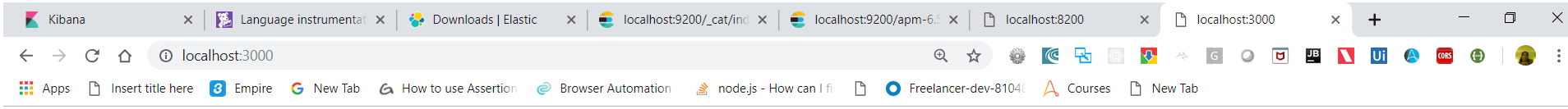
APM

http://localhost:9200/apm-6.5.4-onboarding-2018.12.20/_search?pretty

APM Nodejs

- For apm server 6.3
- npm install elastic-apm-node@1.14.3 --save

APM



Hello World!

APM

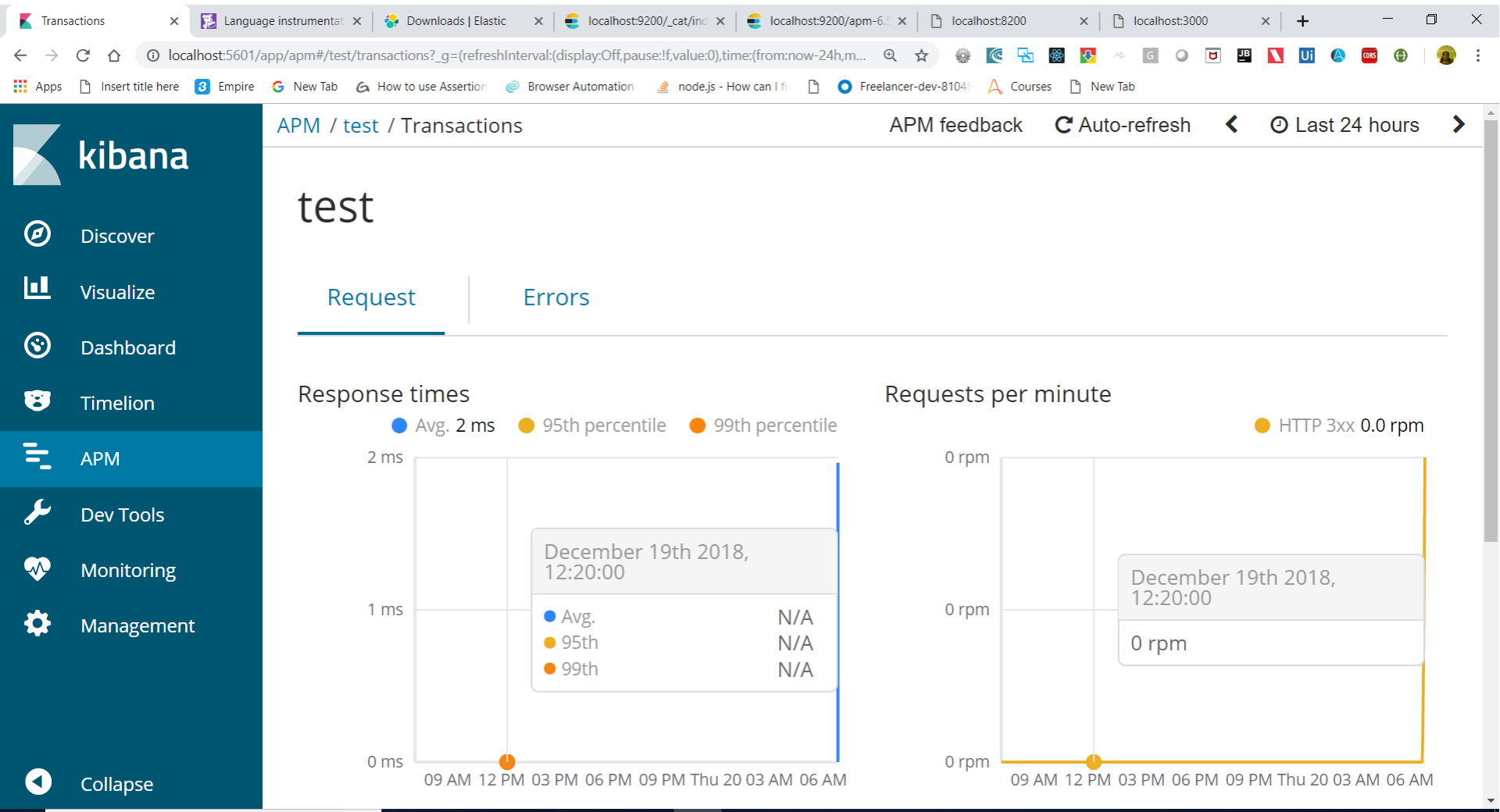
Administrator: Node.js command prompt

```
Your environment has been set up for using Node.js 9.3.0 (x64) and npm.

C:\Windows\System32>npm -g install elastic-apm-node --save
+ elastic-apm-node@2.0.6
added 84 packages in 26.307s

C:\Windows\System32>
```

Type here to search

ENG 06:42 20/12/2018

APM


Transactions
Language instrumentat
Downloads | Elastic
localhost:9200/_cat/ind
localhost:9200/apm-6.5
localhost:8200
localhost:3000
localhost:5601/app/apm#/test/transactions?_g=(refreshInterval:(display:Off,pause:!f,value:0),time:(from:now-24h,m...
Apps
Insert title here
Empire
New Tab
How to use Assertion
Browser Automation
node.js - How can I fi
Freelancer-dev-8104
Courses
New Tab
kibana
Discover
Visualize
Dashboard
Timelion
APM
Dev Tools
Monitoring
Management
Collapse
APM / test / Transactions
APM feedback
Auto-refresh
Last 24 hours
test
Request
Errors
Response times
Avg. 2 ms
95th percentile
99th percentile
2 ms
1 ms
0 ms
December 19th 2018, 12:20:00
Avg. N/A
95th N/A
99th N/A
09 AM 12 PM 03 PM 06 PM 09 PM Thu 20 03 AM 06 AM
Requests per minute
HTTP 3xx 0.0 rpm
0 rpm
0 rpm
0 rpm
December 19th 2018, 12:20:00
0 rpm
09 AM 12 PM 03 PM 06 PM 09 PM Thu 20 03 AM 06 AM
Type here to search
ENG
07:00
20/12/2018

Elastic SQL

- select * from rating where rating=4.0;

Docker

MINGW64:/d/Program Files/Docker Toolbox

```
                        ##         .
                  ## ## ##        ==
               ## ## ## ## ##    ===
           /"""""""""""""""""\___/ ===
      ~~~ {~~ ~~~~ ~~~ ~~~~ ~~~ ~ /  ===- ~~~
           \______ o           __/
             \    \         __/
              \____\_______/

docker is configured to use the default machine with IP 192.168.99.103
For help getting started, check out the docs at https://docs.docker.com


Start interactive shell

Balasubramaniam@DESKTOP-55AGI0I MINGW64 /d/Program Files/Docker Toolbox
$ docker pull docker.elastic.co/elasticsearch/elasticsearch:7.7.1
7.7.1: Pulling from elasticsearch/elasticsearch
86dbb57a3083: Downloading [>                                                  ]  1.051MB/85.34MB
2b5d7fba0568: Download complete
3f15a7e37bf2: Downloading [==>                                                ]  1.119MB/26.86MB
c11eec231e4f: Waiting
3c87444dd504: Waiting
95c144f0b3e7: Waiting
027c17d4d678: Waiting
6ea63efa2205: Waiting
e9b3616d9c02: Waiting
```

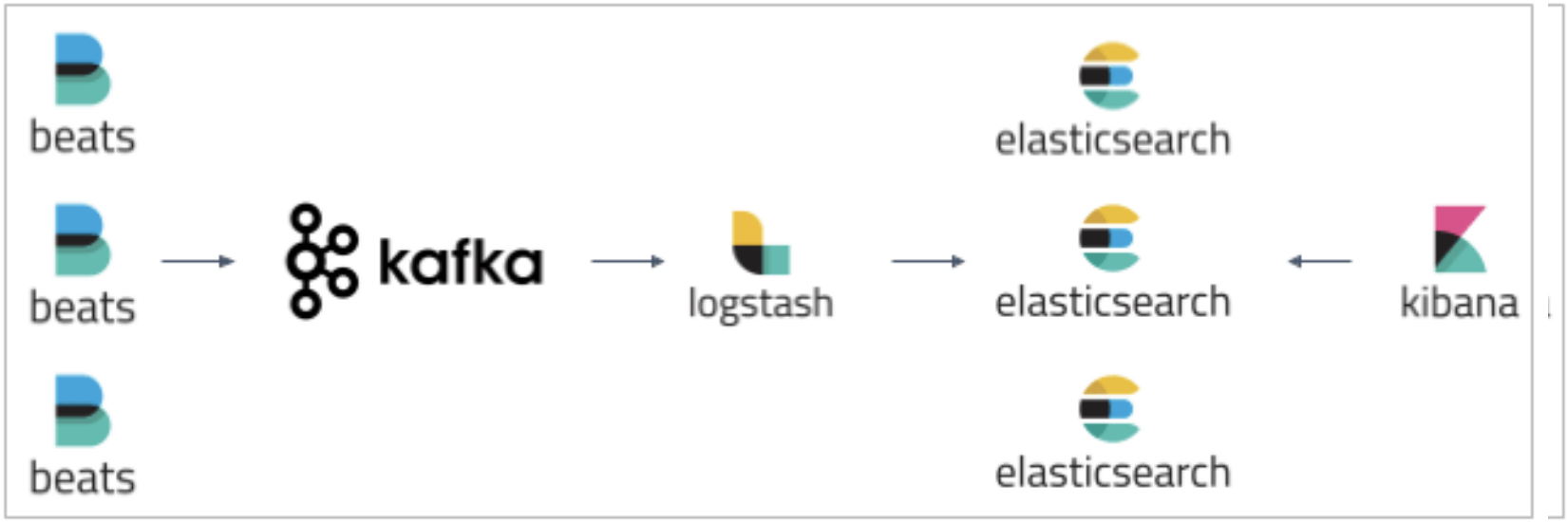
Type here to search

ENG 07:18 04/06/2020

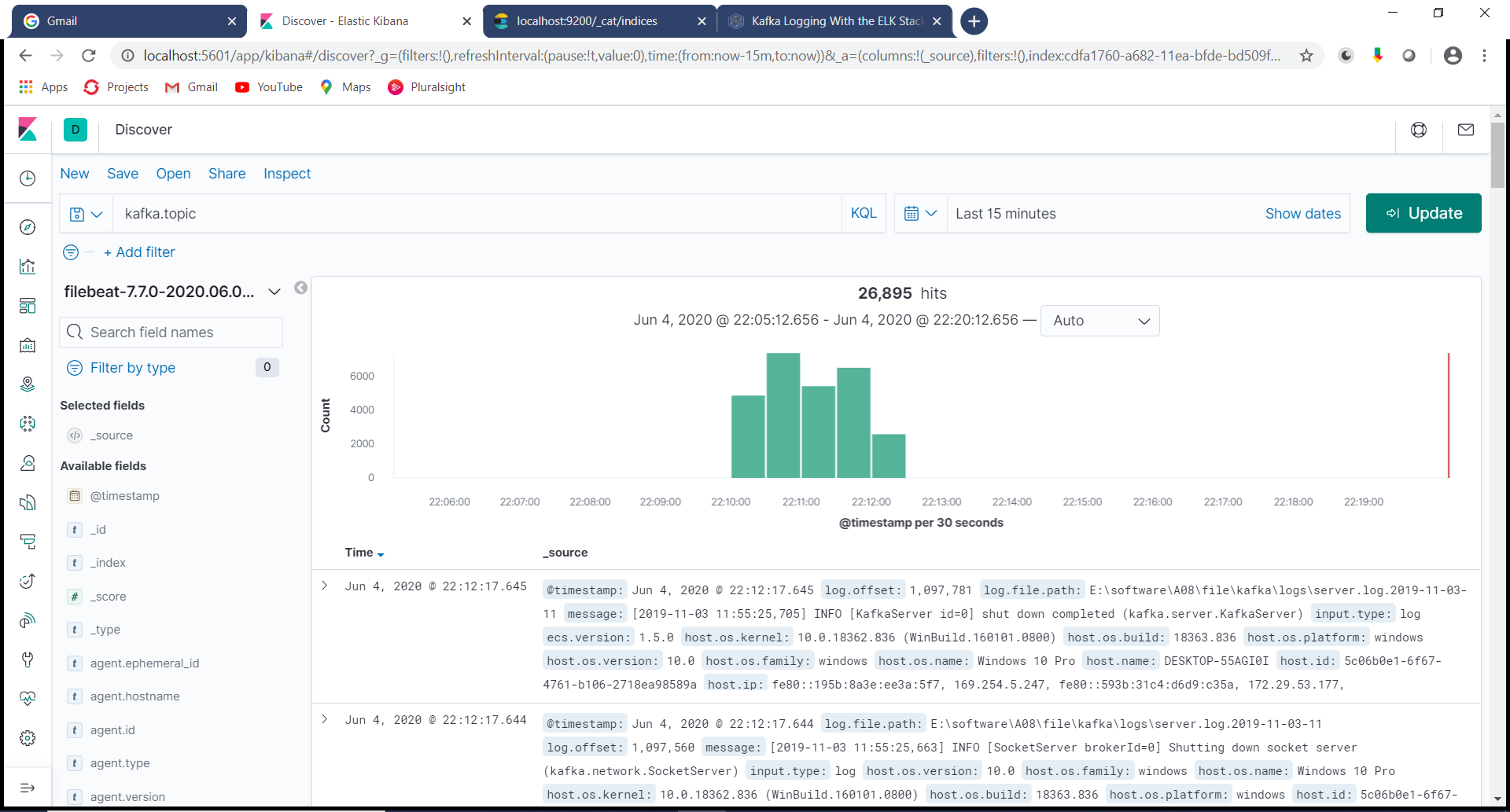
Docker

- docker run -h 192.168.99.103 -p 9200:9200 -p 9300:9300 -e "discovery.type=single-node" docker.elastic.co/elasticsearch/elasticsearch:7.7.1
- Run Below command on Host machine it will resolve the issue
- $ sysctl -w vm.max_map_count=262144

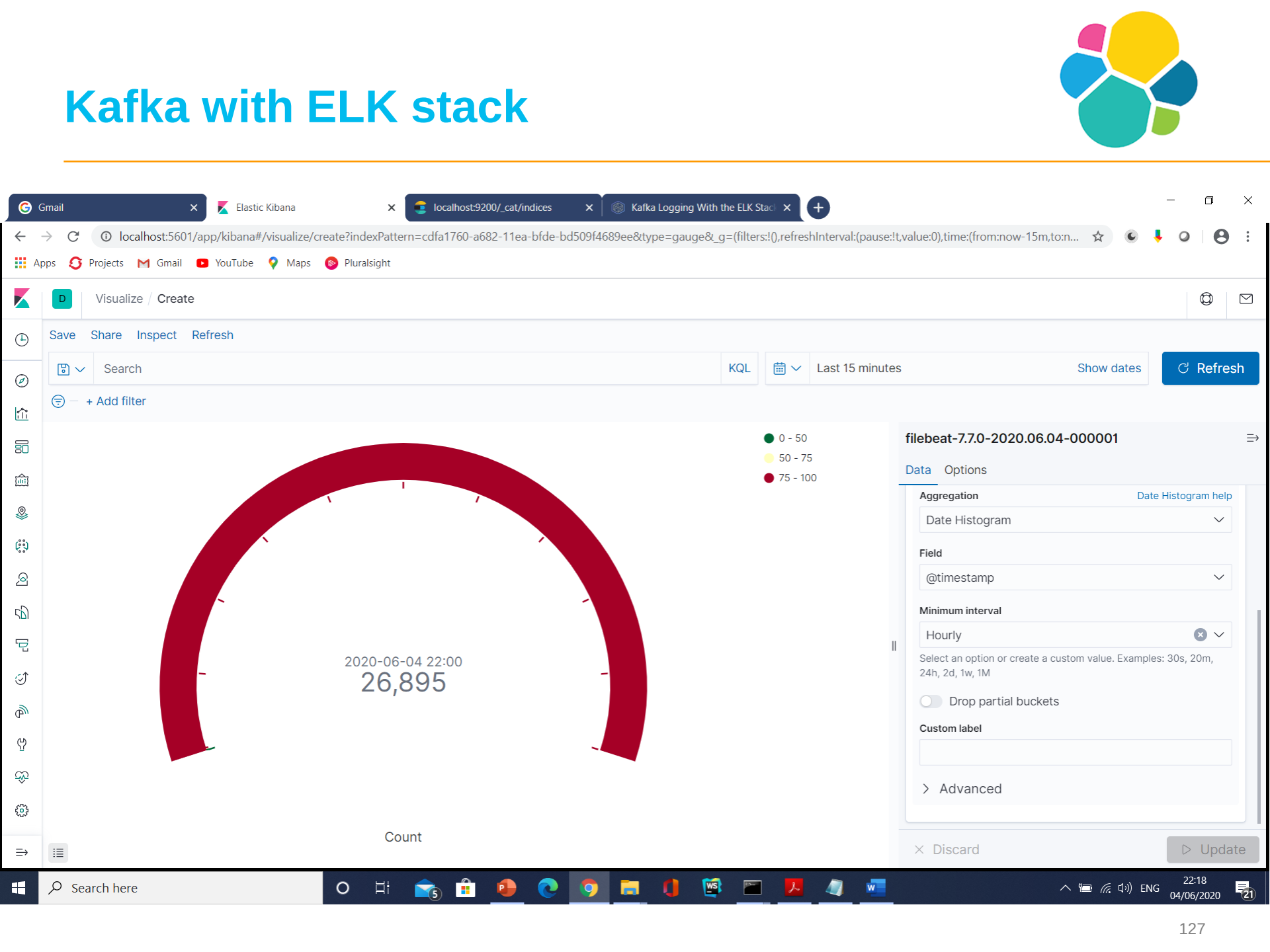
Kafka with ELK stack



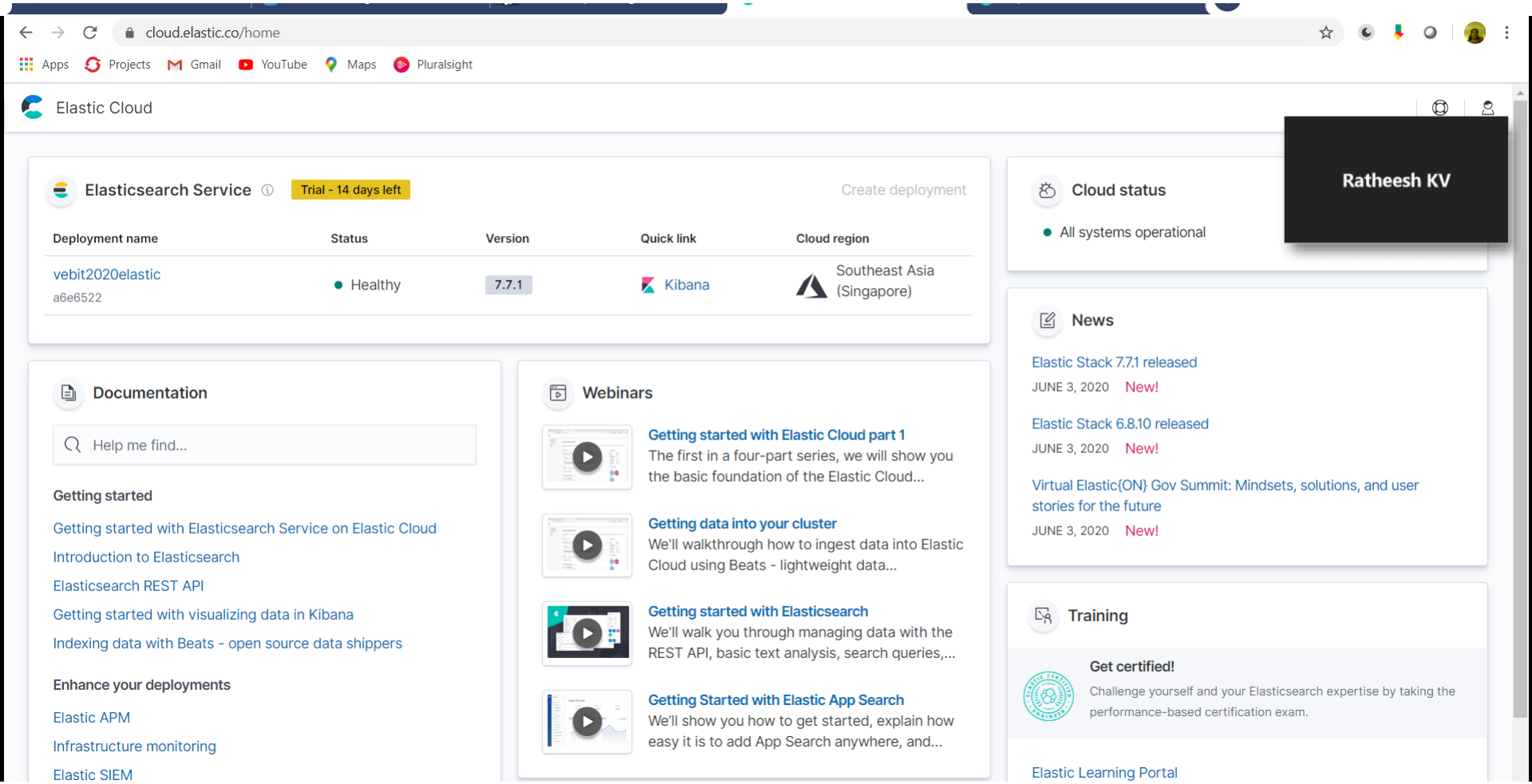
Kafka with ELK stack



Kafka with ELK stack



Elastic Cloud



Xpack Security

- Get license higher than basic
- xpack.security.enabled: true
- Discovery.type:single-node
- There are built-in users that you can use for specific administrative purposes: apm_system, beats_system, elastic, kibana, logstash_system, and remote_monitoring_user.
- Restart Elasticsearch before you set users

Xpack Security

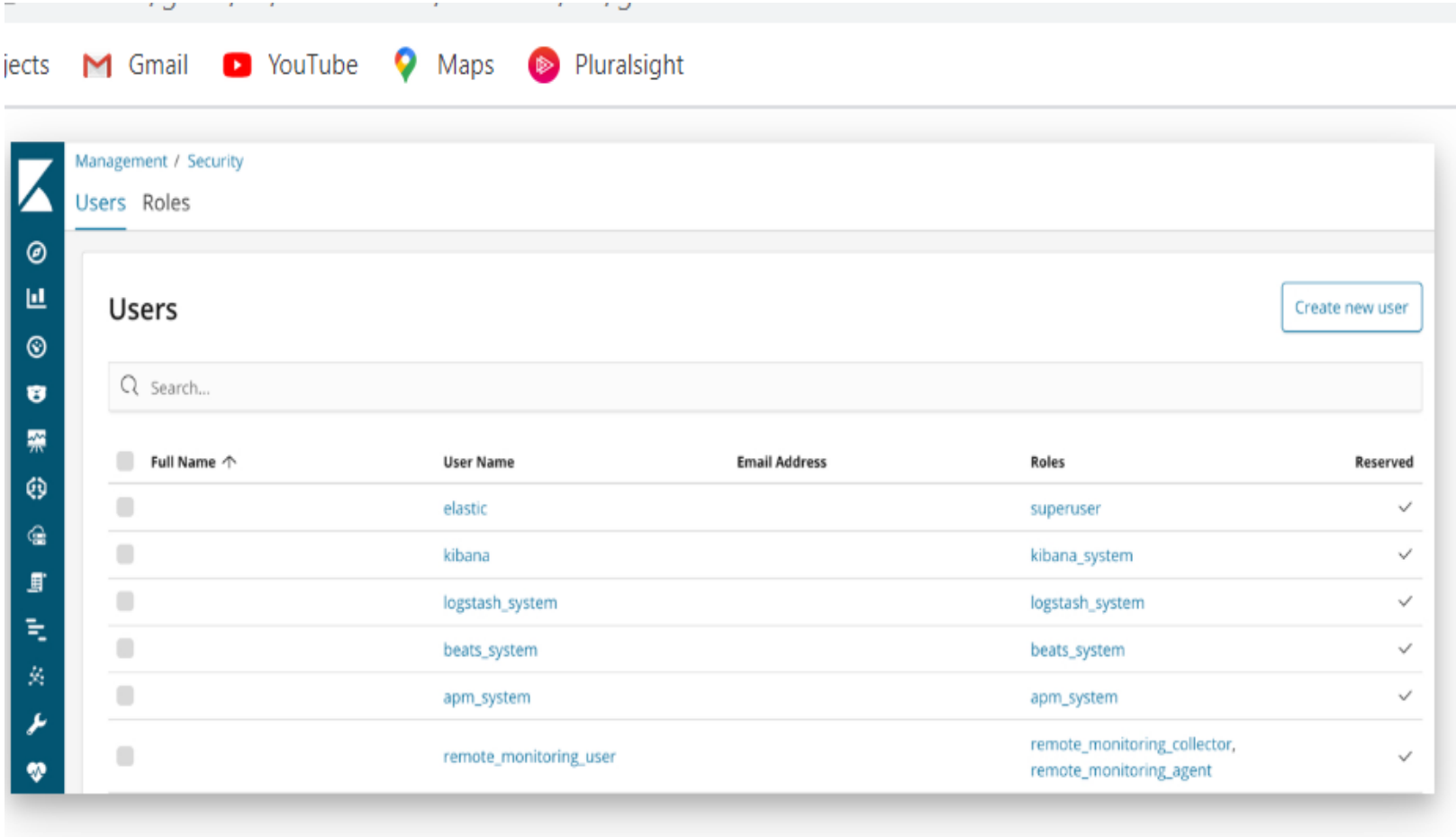
- Set the built-in users' passwords. Run the following command from the Elasticsearch directory:
- ./bin/elasticsearch-setup-passwords interactive
- Use kibana.yml
- elasticsearch.username: "kibana"
- elasticsearch.password: "your_password/bin/kibana-keystore create
- ./bin/kibana-keystore add elasticsearch.username
- ./bin/kibana-keystore add elasticsearch.password"

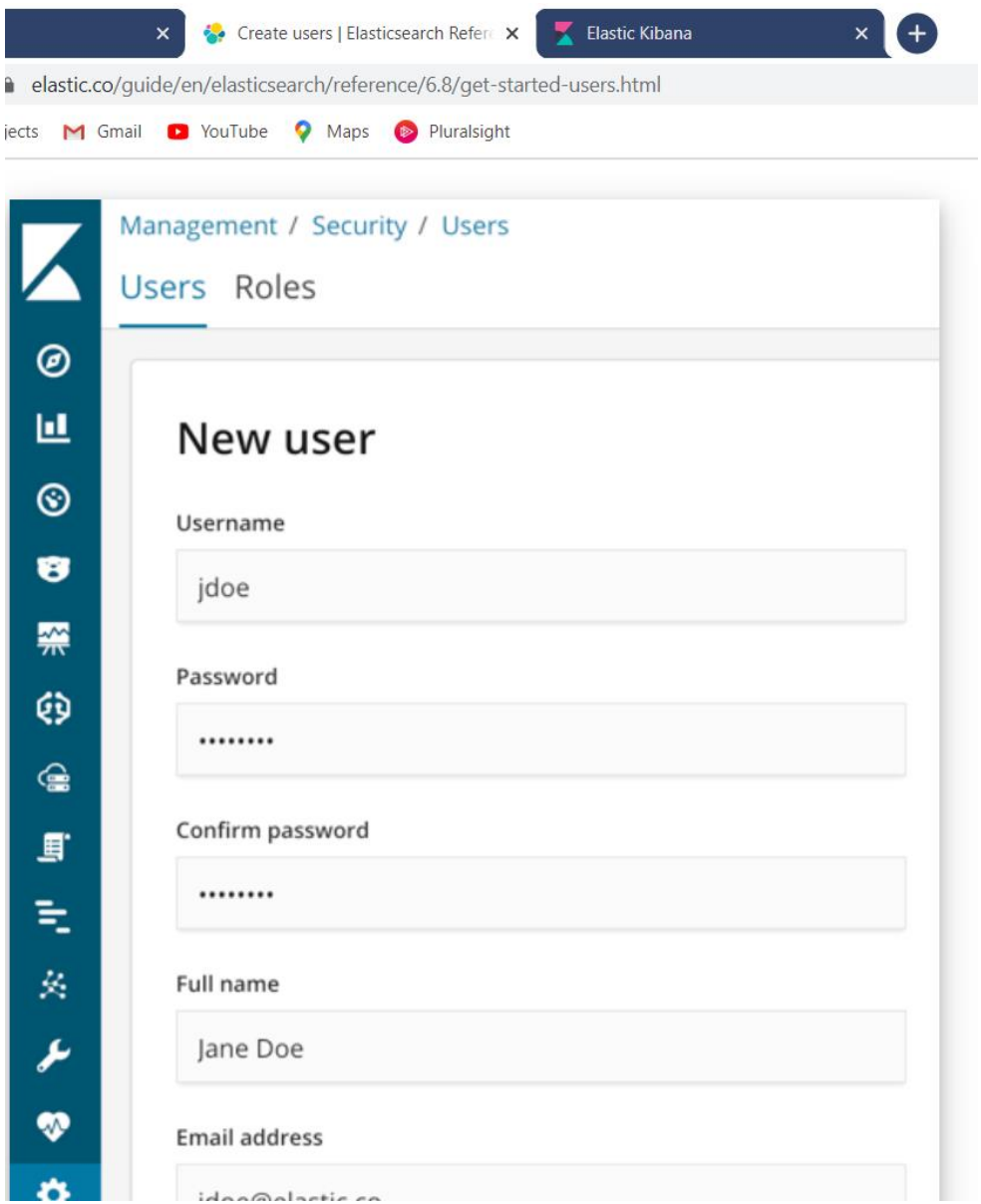
Xpack Security

- Restart kibana

- Let’s create two users in the native realm.

- Log in to Kibana with the elastic built-in user.
- Go to the Management / Security / Users page:

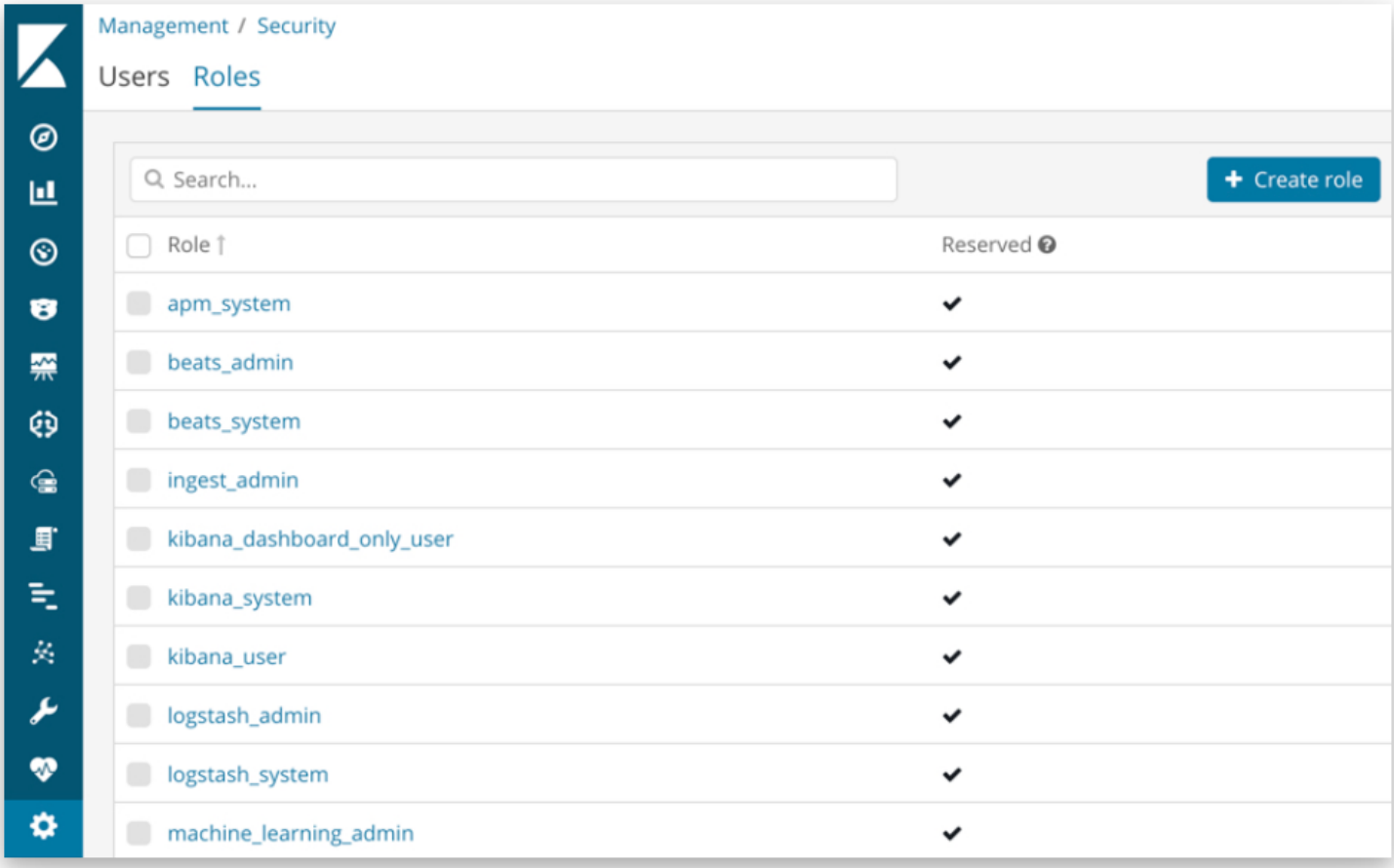

jects
Gmail
YouTube
Maps
Pluralsight
Management / Security
Users
Roles
Users
Create new user
Search...
Full Name
User Name
Email Address
Roles
Reserved
elastic
superuser
kibana
kibana_system
logstash_system
logstash_system
beats_system
beats_system
apm_system
apm_system
remote_monitoring_user
remote_monitoring_collector,
remote_monitoring_agent

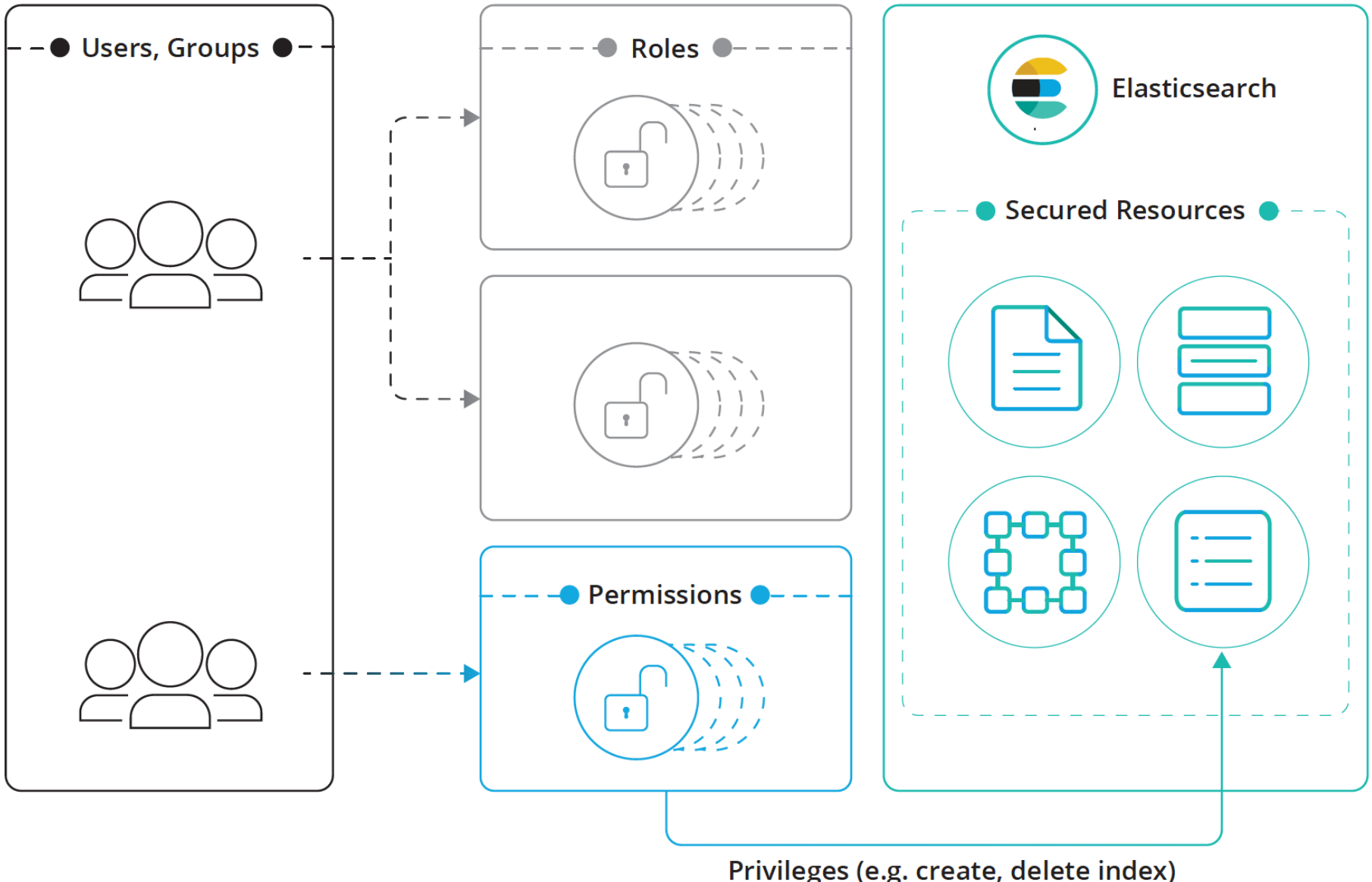

Create users | Elasticsearch Refer
Elastic Kibana
elastic.co/guide/en/elasticsearch/reference/6.8/get-started-users.html
jects
Gmail
YouTube
Maps
Pluralsight
Management / Security / Users
Users
Roles
New user
Username
jdoe
Password
Confirm password
Full name
Jane Doe
Email address

elastic.co/guide/en/elasticsearch/reference/6.8/get-started-roles.html

Apps Projects Gmail YouTube Maps Pluralsight

Go to the **Management / Security / Roles** page to see them:




Users, Groups
Roles
Permissions
Elasticsearch
Secured Resources
Privileges (e.g. create, delete index)

Built in roles

- ingest_admin
- Grants access to manage all index templates and all ingest pipeline configurations.
- This role does not provide the ability to create indices; those privileges must be defined in a separate role.
- kibana_dashboard_only_user
- Grants access to the Kibana Dashboard and read-only permissions to Kibana. This role does not have access to editing tools in Kibana. For more information, see Kibana Dashboard Only Mode.
- kibana_system
- Grants access necessary for the Kibana system user to read from and write to the Kibana indices, manage index templates and tokens, and check the availability of the Elasticsearch cluster. This role grants read access to the .monitoring-* indices and read and write access to the .reporting-* indices.

Built in roles

- apm_system
- Grants access necessary for the APM system user to send system-level data (such as monitoring) to Elasticsearch.
- beats_admin
- Grants access to the .management-beats index, which contains configuration information for the Beats.
- beats_system
- Grants access necessary for the Beats system user to send system-level data (such as monitoring) to Elasticsearch.

Role

- click_admins:
- run_as: ['clicks_watcher_1']
- cluster: ['monitor']
- indices:
- - names: ['events-*']
- privileges: ['read']
- field_security:
- grant: ['category', '@timestamp', 'message']
- query: '{"match": {"category": "click"}}'

Document Level Security

```
POST /_xpack/security/role/click_role
{
  "indices": [
    {
      "names": [ "events-*" ],
      "privileges": [ "read" ],
      "query": "{\"match\": {\"category\": \"click\"}}"
    }
  ]
}
```

Document Level Security

```
POST /_xpack/security/role/dept_role
{
  "indices" : [
    {
      "names" : [ "*" ],
      "privileges" : [ "read" ],
      "query" : {
        "term" : { "department_id" : 12 }
      }
    }
  ]
}
```

Field Level Security

```
POST /_xpack/security/role/test_role1
{
  "indices": [
    {
      "names": [ "events-*" ],
      "privileges": [ "read" ],
      "field_security" : {
        "grant" : [ "category", "@timestamp", "message" ]
      }
    }
  ]
}
```

Field Level Security

```
POST /_xpack/security/role/test_role4
{
  "indices" : [
    {
      "names" : [ "*" ],
      "privileges" : [ "read" ],
      "field_security" : {
        "grant" : [ "customer.*" ]
      }
    }
  ]
}
```

Grant index level privileges

- POST /_aliases
- {
- "actions" : [
- { "add" : { "index" : "2015", "alias" : "current_year" } }
-]
- }

Manage users and Groups

- monitoring:
- - "cn=admins,dc=example,dc=com"
- user:
- - "cn=John Doe,cn=contractors,dc=example,dc=com"
- - "cn=users,dc=example,dc=com"
- - "cn=admins,dc=example,dc=com"

Manage users and Groups

- PUT _xpack/security/role_mapping/admin_user
- {
- "roles" : ["monitoring"],
- "rules" : { "field" : { "dn" : "cn=Admin,ou=example,o=com" } },
- "enabled": true
- }

Document

Doc ID	Content
1	This is a brown fox
2	This is a brown dog
3	This dog is really brown
4	The dog is brown but this document is very very long
5	There is also a white cat
6	The quick brown fox jumps over the lazy dog

General Query

```
"query": {
    "match": {
        "content": {
            "query": "quick brown dog"
        }
    }
}
```

Document

Pos	Doc ID	Content	Score
1	6	The quick brown fox jumps over the lazy dog	0.81502354
2	2	This is a brown dog	0.26816052
3	3	This dog is really brown	0.26816052
4	4	The dog is brown but this document is very very long	0.15323459
5	1	This is a brown fox	0.055916067

Query

```
{
    "query": {
        "match": {
            "content": {
                "query": "quick brown dog",
                "minimum_should_match": 75%
            }
        }
    }
}
```

Phrase Query

```
"query": {
    "match_phrase": {
        "content": "brown dog"
    }
}
}
```

Proximity Query

```
{
    "query": {
        "match_phrase": {
            "content": {
                "query": "brown dog",
                "slop": 3
            }
        }
    }
}
```

Result

Pos	Doc ID	Content	Score
1	2	This is a brown dog	0.9547657
2	4	The dog is brown but this document is very very long	0.2727902

Query

```
{
    "query": {
        "match_phrase": {
            "content": {
                "query": "brown dog",
                "slop": 4
            }
        }
    }
}
```

Result

Pos	Doc ID	Content	Score
1	2	This is a brown dog	0.9547657
2	3	This dog is really brown	0.4269842
3	4	The dog is brown but this document is very very long	0.2727902

Questions

Module Summary

- Spring Integration Framework.
- Message, Channel and Adapter
- Understood the different Component Integration
- Understood the Event-Driven Architecture