
graphene-elastic Documentation

Release 0.6

Artur Barseghyan <artur.barseghyan@gmail.com>

Oct 10, 2019

Contents

1	Prerequisites	3
2	Main features and highlights	5
3	Documentation	7
4	Installation	9
5	Examples	11
5.1	Install requirements	11
5.2	Populate sample data	11
5.3	Sample document definition	11
5.4	Sample apps	12
5.4.1	Sample Flask app	12
5.4.2	Sample Django app	12
5.4.3	ConnectionField example	13
5.4.3.1	Filter	15
5.4.3.1.1	Sample queries	15
5.4.3.1.2	Implemented filter lookups	16
5.4.3.2	Search	17
5.4.3.3	Ordering	18
5.4.3.4	Pagination	18
5.4.3.5	Highlighting	19
6	Road-map	21
7	Testing	23
7.1	Running tests	23
7.2	Testing with Docker	24
8	Debugging	25
9	Writing documentation	27
10	License	29
11	Support	31

12 Author	33
13 Project documentation	35
13.1 Concepts	36
13.1.1 Sample document definition	36
13.1.2 Sample schema definition	37
13.1.2.1 filter_backends	39
13.1.2.2 filter_fields	40
13.1.2.3 search_fields	41
13.1.2.4 ordering_fields	41
13.1.2.5 ordering_defaults	41
13.2 Quick start	41
13.2.1 Clone the repository	41
13.2.2 Start Elasticsearch	42
13.2.3 Install requirements	42
13.2.4 Populate dummy data	42
13.2.5 Run the test server	42
13.2.6 Open the <code>graphiql</code> client the browser	42
13.2.7 Make some experiments	42
13.2.8 Run tests	42
13.3 Search	43
13.4 Filtering	43
13.4.1 Filter lookups	43
13.4.1.1 Filter lookup <code>contains</code>	44
13.4.1.2 Filter lookup <code>ends_with</code>	44
13.4.1.3 Filter lookup <code>exclude</code>	45
13.4.1.4 Filter lookup <code>exists</code>	45
13.4.1.5 Filter lookup <code>gt</code>	45
13.4.1.6 Filter lookup <code>gte</code>	46
13.4.1.7 Filter lookup <code>in</code>	46
13.4.1.8 Filter lookup <code>lt</code>	46
13.4.1.9 Filter lookup <code>lte</code>	47
13.4.1.10 Filter lookup <code>prefix</code>	47
13.4.1.11 Filter lookup <code>range</code>	47
13.4.1.12 Filter lookup <code>starts_with</code>	48
13.4.1.13 Filter lookup <code>term</code>	48
13.4.1.14 Filter lookup <code>terms</code>	48
13.4.1.15 Filter lookup <code>wildcard</code>	49
13.5 Post-filter backend	49
13.5.1 Filter lookups	49
13.5.1.1 Filter lookup <code>contains</code>	50
13.5.1.2 Filter lookup <code>ends_with</code>	50
13.5.1.3 Filter lookup <code>exclude</code>	50
13.5.1.4 Filter lookup <code>exists</code>	51
13.5.1.5 Filter lookup <code>gt</code>	51
13.5.1.6 Filter lookup <code>gte</code>	51
13.5.1.7 Filter lookup <code>in</code>	52
13.5.1.8 Filter lookup <code>lt</code>	52
13.5.1.9 Filter lookup <code>lte</code>	52
13.5.1.10 Filter lookup <code>prefix</code>	53
13.5.1.11 Filter lookup <code>range</code>	53
13.5.1.12 Filter lookup <code>starts_with</code>	53
13.5.1.13 Filter lookup <code>term</code>	53
13.5.1.14 Filter lookup <code>terms</code>	54

13.5.1.15 Filter lookup wildcard	54
13.6 Ordering	54
13.7 Highlight	55
13.8 Source	57
13.9 Faceted search	58
13.10 Pagination	62
13.10.1 Limits	62
13.10.2 Enforce first or last	62
13.10.3 User controlled pagination	62
13.11 Custom filter backends	63
13.12 Settings	65
13.13 Running Elasticsearch	66
13.13.1 Docker	66
13.13.1.1 Project default	66
13.13.1.2 Run specific version	66
13.13.1.2.1 6.x	66
13.13.1.2.2 7.x	66
13.14 FAQ	66
13.14.1 Questions and answers	67
13.15 Debugging	67
13.16 Release history and notes	67
13.16.1 0.6	67
13.16.2 0.5	68
13.16.3 0.4	68
13.16.4 0.3	68
13.16.5 0.2	68
13.16.6 0.1	68
13.16.7 0.0.13	68
13.16.8 0.0.12	69
13.16.9 0.0.11	69
13.16.100.0.10	69
13.16.110.0.9	69
13.16.120.0.8	69
13.16.130.0.7	69
13.16.140.0.6	70
13.16.150.0.5	70
13.16.160.0.4	70
13.16.170.0.3	70
13.16.180.0.2	70
13.16.190.0.1	70
13.17 graphene_elastic package	71
13.17.1 Subpackages	71
13.17.1.1 graphene_elastic.filter_backends package	71
13.17.1.1.1 Subpackages	71
13.17.1.1.1.1 graphene_elastic.filter_backends.filtering package	71
13.17.1.1.1.2 Submodules	71
13.17.1.1.1.3 graphene_elastic.filter_backends.filtering.common module	71
13.17.1.1.1.4 Module contents	73
13.17.1.1.1.5 graphene_elastic.filter_backends.search package	73
13.17.1.1.1.6 Submodules	73
13.17.1.1.1.7 graphene_elastic.filter_backends.search.common module	73
13.17.1.1.1.8 Module contents	76
13.17.1.1.2 Submodules	76
13.17.1.1.3 graphene_elastic.filter_backends.base module	76

13.17.1.1.4	Module contents	79
13.17.1.2	graphene_elastic.types package	79
13.17.1.2.1	Submodules	79
13.17.1.2.2	graphene_elastic.types.elastic_types module	79
13.17.1.2.3	graphene_elastic.types.json_string module	80
13.17.1.2.4	Module contents	80
13.17.2	Submodules	80
13.17.3	graphene_elastic.advanced_types module	80
13.17.4	graphene_elastic.constants module	81
13.17.5	graphene_elastic.converter module	81
13.17.6	graphene_elastic.enums module	81
13.17.7	graphene_elastic.fields module	82
13.17.8	graphene_elastic.helpers module	82
13.17.9	graphene_elastic.registry module	83
13.17.10	graphene_elastic.settings module	83
13.17.11	graphene_elastic.utils module	83
13.17.12	Module contents	83
14	Indices and tables	85
	Python Module Index	87
	Index	89

Elasticsearch (DSL) integration for Graphene.

Note: Project status is alpha.

CHAPTER 1

Prerequisites

- Graphene 2.x. *Support for Graphene 1.x is not planned, but might be considered.*
- Python 3.6, 3.7. *Support for Python 2 is not intended.*
- Elasticsearch 6.x, 7.x. *Support for Elasticsearch 5.x is not intended.*

CHAPTER 2

Main features and highlights

- Implemented `ElasticsearchConnectionField` and `ElasticsearchObjectType` are the core classes to work with graphene.
- Pluggable backends for searching, filtering, ordering, etc. Don't like existing ones? Override, extend or write your own.
- Search backend.
- Filter backend.
- Ordering backend.
- Pagination.
- Highlighting backend.
- Source filter backend.
- Faceted search backend (including global aggregations).
- Post filter backend.

See the [Road-map](#) for what's yet planned to implemented.

Do you need a similar tool for Django REST Framework? Check [django-elasticsearch-dsl-drf](#).

CHAPTER 3

Documentation

Documentation is available on [Read the Docs](#).

CHAPTER 4

Installation

Install latest stable version from PyPI:

```
pip install graphene-elastic
```

Or latest development version from GitHub:

```
pip install https://github.com/barseghyanartur/graphene-elastic/archive/master.zip
```


5.1 Install requirements

```
pip install -r requirements.txt
```

5.2 Populate sample data

The following command will create indexes for `User` and `Post` documents and populate them with sample data:

```
./scripts/populate_elasticsearch_data.sh
```

5.3 Sample document definition

search_index/documents/post.py

See `examples/search_index/documents/post.py` for full example.

```
import datetime
from elasticsearch_dsl import (
    Boolean,
    Date,
    Document,
    InnerDoc,
    Keyword,
    Nested,
    Text,
    Integer,
)
```

(continues on next page)

(continued from previous page)

```
class Comment(InnerDoc):

    author = Text(fields={'raw': Keyword()})
    content = Text(analyzer='snowball')
    created_at = Date()

    def age(self):
        return datetime.datetime.now() - self.created_at

class Post(Document):

    title = Text(
        fields={'raw': Keyword()})
    content = Text()
    created_at = Date()
    published = Boolean()
    category = Text(
        fields={'raw': Keyword()})
    comments = Nested(Comment)
    tags = Text(
        analyzer=html_strip,
        fields={'raw': Keyword(multi=True)},
        multi=True)
    num_views = Integer()

    class Index:
        name = 'blog_post'
        settings = {
            'number_of_shards': 1,
            'number_of_replicas': 1,
            'blocks': {'read_only_allow_delete': None},
        }
```

5.4 Sample apps

5.4.1 Sample Flask app

Run the sample Flask app:

```
./scripts/run_flask.sh
```

Open Flask graphiql client

```
http://127.0.0.1:8001/graphql
```

5.4.2 Sample Django app

Run the sample Django app:

```
./scripts/run_django.sh runserver
```

Open Django graphiql client

```
http://127.0.0.1:8000/graphql
```

5.4.3 ConnectionField example

ConnectionField is the most flexible and feature rich solution you have. It uses filter backends which you can tie to your needs the way you want in a declarative manner.

Sample schema definition

```
import graphene
from graphene_elastic import (
    ElasticsearchObjectType,
    ElasticsearchConnectionField,
)
from graphene_elastic.filter_backends import (
    FilteringFilterBackend,
    SearchFilterBackend,
    HighlightFilterBackend,
    OrderingFilterBackend,
    DefaultOrderingFilterBackend,
)
from graphene_elastic.constants import (
    LOOKUP_FILTER_PREFIX,
    LOOKUP_FILTER_TERM,
    LOOKUP_FILTER_TERMS,
    LOOKUP_FILTER_WILDCARD,
    LOOKUP_QUERY_EXCLUDE,
    LOOKUP_QUERY_IN,
)

# Object type definition
class Post(ElasticsearchObjectType):

    class Meta(object):
        document = PostDocument
        interfaces = (Node,)
        filter_backends = [
            FilteringFilterBackend,
            SearchFilterBackend,
            HighlightFilterBackend,
            OrderingFilterBackend,
            DefaultOrderingFilterBackend,
        ]

    # For `FilteringFilterBackend` backend
    filter_fields = {
        # The dictionary key (in this case `title`) is the name of
        # the corresponding GraphQL query argument. The dictionary
        # value could be simple or complex structure (in this case
        # complex). The `field` key points to the `title.raw`, which
        # is the field name in the Elasticsearch document
        # (`PostDocument`). Since `lookups` key is provided, number
```

(continues on next page)

(continued from previous page)

```

# of lookups is limited to the given set, while term is the
# default lookup (as specified in `default_lookup`).
'title': {
    'field': 'title.raw',
    # Available lookups
    'lookups': [
        LOOKUP_FILTER_TERM,
        LOOKUP_FILTER_TERMS,
        LOOKUP_FILTER_PREFIX,
        LOOKUP_FILTER_WILDCARD,
        LOOKUP_QUERY_IN,
        LOOKUP_QUERY_EXCLUDE,
    ],
    # Default lookup
    'default_lookup': LOOKUP_FILTER_TERM,
},

# The dictionary key (in this case `category`) is the name of
# the corresponding GraphQL query argument. Since no lookups
# or default_lookup is provided, defaults are used (all lookups
# available, term is the default lookup). The dictionary value
# (in this case `category.raw`) is the field name in the
# Elasticsearch document (`PostDocument`).
'category': 'category.raw',

# The dictionary key (in this case `tags`) is the name of
# the corresponding GraphQL query argument. Since no lookups
# or default_lookup is provided, defaults are used (all lookups
# available, term is the default lookup). The dictionary value
# (in this case `tags.raw`) is the field name in the
# Elasticsearch document (`PostDocument`).
'tags': 'tags.raw',

# The dictionary key (in this case `num_views`) is the name of
# the corresponding GraphQL query argument. Since no lookups
# or default_lookup is provided, defaults are used (all lookups
# available, term is the default lookup). The dictionary value
# (in this case `num_views`) is the field name in the
# Elasticsearch document (`PostDocument`).
'num_views': 'num_views',
}

# For `SearchFilterBackend` backend
search_fields = {
    'title': {'boost': 4},
    'content': {'boost': 2},
    'category': None,
}

# For `OrderingFilterBackend` backend
ordering_fields = {
    # The dictionary key (in this case `tags`) is the name of
    # the corresponding GraphQL query argument. The dictionary
    # value (in this case `tags.raw`) is the field name in the
    # Elasticsearch document (`PostDocument`).
    'title': 'title.raw',

```

(continues on next page)

(continued from previous page)

```

# The dictionary key (in this case `created_at`) is the name of
# the corresponding GraphQL query argument. The dictionary
# value (in this case `created_at`) is the field name in the
# Elasticsearch document (`PostDocument`).
'created_at': 'created_at',

# The dictionary key (in this case `num_views`) is the name of
# the corresponding GraphQL query argument. The dictionary
# value (in this case `num_views`) is the field name in the
# Elasticsearch document (`PostDocument`).
'num_views': 'num_views',
}

# For `DefaultOrderingFilterBackend` backend
ordering_defaults = (
    '-num_views', # Field name in the Elasticsearch document
    'title.raw', # Field name in the Elasticsearch document
)

# For `HighlightFilterBackend` backend
highlight_fields = {
    'title': {
        'enabled': True,
        'options': {
            'pre_tags': ["<b>"],
            'post_tags': ["</b>"],
        }
    },
    'content': {
        'options': {
            'fragment_size': 50,
            'number_of_fragments': 3
        }
    },
    'category': {},
}

# Query definition
class Query(graphene.ObjectType):
    all_post_documents = ElasticsearchConnectionField(Post)

# Schema definition
schema = graphene.Schema(query=Query)

```

5.4.3.1 Filter

5.4.3.1.1 Sample queries

Since we didn't specify any lookups on *category*, by default all lookups are available and the default lookup would be term. Note, that in the `{value: "Elastic"}` part, the value stands for default lookup, whatever it has been set to.

```

query PostsQuery {
  allPostDocuments(filter: {category: {value: "Elastic"}}) {

```

(continues on next page)

(continued from previous page)

```
edges {
  node {
    id
    title
    category
    content
    createdAt
    comments
  }
}
```

But, we could use another lookup (in example below - terms). Note, that in the `{terms:["Elastic", "Python"]}` part, the `terms` is the lookup name.

```
query PostsQuery {
  allPostDocuments(
    filter:{category:{terms:["Elastic", "Python"]}}
  ) {
    edges {
      node {
        id
        title
        category
        content
        createdAt
        comments
      }
    }
  }
}
```

Or apply a `gt` (range) query in addition to filtering:

```
{
  allPostDocuments(filter:{
    category:{term:"Python"},
    numViews:{gt:"700"}
  }) {
    edges {
      node {
        category
        title
        comments
        numViews
      }
    }
  }
}
```

5.4.3.1.2 Implemented filter lookups

The following lookups are available:

- `contains`

- `ends_with` (or `endsWith` for camelCase)
- `exclude`
- `exists`
- `gt`
- `gte`
- `in`
- `is_null` (or `isNull` for camelCase)
- `lt`
- `lte`
- `prefix`
- `range`
- `starts_with` (or `startsWith` for camelCase)
- `term`
- `terms`
- `wildcard`

See [dedicated documentation on filter lookups](#) for more information.

5.4.3.2 Search

Search in all fields:

```
query {
  allPostDocuments(
    search:{query:"Release Box"}
  ) {
    edges {
      node {
        category
        title
        content
      }
    }
  }
}
```

Search in specific fields:

```
query {
  allPostDocuments(
    search:{
      title:{value:"Release", boost:2},
      content:{value:"Box"}
    }
  ) {
    edges {
      node {
        category

```

(continues on next page)

(continued from previous page)

```
        title
        content
      }
    }
  }
}
```

5.4.3.3 Ordering

Possible choices are ASC and DESC.

```
query {
  allPostDocuments(
    filter:{category:{term:"Photography"}},
    ordering:{title:ASC}
  ) {
    edges {
      node {
        category
        title
        content
        numViews
        tags
      }
    }
  }
}
```

5.4.3.4 Pagination

The first, last, before and after arguments are supported. By default number of results is limited to 100.

```
query {
  allPostDocuments(first:12) {
    pageInfo {
      startCursor
      endCursor
      hasNextPage
      hasPreviousPage
    }
    edges {
      cursor
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```


5.4.3.5 Highlighting

Simply, list the fields you want to highlight. This works only in combination with search.

```
query {
  allPostDocuments(
    search:{content:{value:"alice"}, title:{value:"alice"}},
    highlight:[category, content]
  ) {
    edges {
      node {
        title
        content
        highlight
      }
      cursor
    }
  }
}
```


CHAPTER 6

Road-map

Road-map and development plans.

This package was designed after [django-elasticsearch-dsl-drf](#). It's intended to offer similar functionality in [graphene-elastic](#) (this package).

Lots of features are planned to be released in the upcoming Beta releases:

- Suggester backend.
- Nested backend.
- Geo-spatial backend.
- Filter lookup `geo_bounding_box` (or `geoBoundingBox` for camelCase).
- Filter lookup `geo_distance` (or `geoDistance` for camelCase).
- Filter lookup `geo_polygon` (or `geoPolygon` for camelCase).
- More-like-this backend.
- Complex search backends, such as Simple query search.

Stay tuned or reach out if you want to help.

Project is covered with tests.

7.1 Running tests

By defaults tests are executed against the Elasticsearch 7.x.

Run Elasticsearch 7.x with Docker

```
docker-compose up elasticsearch
```

Install test requirements

```
pip install -r requirements/test.txt
```

To test with all supported Python versions type:

```
tox
```

To test against specific environment, type:

```
tox -e py37
```

To test just your working environment type:

```
./runtests.py
```

To run a single test module in your working environment type:

```
./runtests.py src/graphene_elastic/tests/test_filter_backend.py
```

To run a single test class in a given test module in your working environment type:

```
./runtests.py src/graphene_elastic/tests/test_filter_backend.  
↳py::FilterBackendElasticTestCase
```

7.2 Testing with Docker

```
docker-compose -f docker-compose.yml -f docker-compose-test.yml up --build test
```

CHAPTER 8

Debugging

For development purposes, you could use the flask app (easy to debug). Standard pdb works (`import pdb; pdb.set_trace()`). If ipdb does not work well for you, use ptpdb.

Writing documentation

Keep the following hierarchy.

```
=====  
title  
=====  
  
header  
=====  
  
sub-header  
-----  
  
sub-sub-header  
~~~~~  
  
sub-sub-sub-header  
^^^^^  
  
sub-sub-sub-sub-header  
+++++  
  
sub-sub-sub-sub-sub-header  
*****
```


CHAPTER 10

License

GPL-2.0-only OR LGPL-2.1-or-later

CHAPTER 11

Support

For any issues contact me at the e-mail given in the *Author* section.

CHAPTER 12

Author

Artur Barseghyan <artur.barseghyan@gmail.com>

Contents:

Table of Contents

- *graphene-elastic*
 - *Prerequisites*
 - *Main features and highlights*
 - *Documentation*
 - *Installation*
 - *Examples*
 - * *Install requirements*
 - * *Populate sample data*
 - * *Sample document definition*
 - * *Sample apps*
 - *Sample Flask app*
 - *Sample Django app*
 - *ConnectionField example*
 - *Filter*
 - *Sample queries*
 - *Implemented filter lookups*
 - *Search*
 - *Ordering*

- *Pagination*
- *Highlighting*
- *Road-map*
- *Testing*
 - * *Running tests*
 - * *Testing with Docker*
- *Debugging*
- *Writing documentation*
- *License*
- *Support*
- *Author*
- *Project documentation*
- *Indices and tables*

13.1 Concepts

In order to explain in details, we need an imaginary app.

13.1.1 Sample document definition

search_index/documents/post.py

See *examples/search_index/documents/post.py* for full example.

```
import datetime
from elasticsearch_dsl import (
    Boolean,
    Date,
    Document,
    InnerDoc,
    Keyword,
    Nested,
    Text,
    Integer,
)

class Comment(InnerDoc):

    author = Text(fields={'raw': Keyword()})
    content = Text(analyzer='snowball')
    created_at = Date()

    def age(self):
        return datetime.datetime.now() - self.created_at
```

(continues on next page)

(continued from previous page)

```

class Post(Document):

    title = Text(
        fields={'raw': Keyword()}
    )
    content = Text()
    created_at = Date()
    published = Boolean()
    category = Text(
        fields={'raw': Keyword()}
    )
    comments = Nested(Comment)
    tags = Text(
        analyzer=html_strip,
        fields={'raw': Keyword(multi=True)},
        multi=True
    )
    num_views = Integer()

    class Index:
        name = 'blog_post'
        settings = {
            'number_of_shards': 1,
            'number_of_replicas': 1,
            'blocks': {'read_only_allow_delete': None},
        }

```

13.1.2 Sample schema definition

ConnectionField is the most flexible and feature rich solution you have. It uses filter backends which you can tie to your needs the way you want in a declarative manner.

schema.py

```

import graphene
from graphene_elastic import (
    ElasticsearchObjectType,
    ElasticsearchConnectionField,
)
from graphene_elastic.filter_backends import (
    FilteringFilterBackend,
    SearchFilterBackend,
    OrderingFilterBackend,
    DefaultOrderingFilterBackend,
)
from graphene_elastic.constants import (
    LOOKUP_FILTER_PREFIX,
    LOOKUP_FILTER_TERM,
    LOOKUP_FILTER_TERMS,
    LOOKUP_FILTER_WILDCARD,
    LOOKUP_QUERY_EXCLUDE,
    LOOKUP_QUERY_IN,
)

# Object type definition

```

(continues on next page)

(continued from previous page)

```
class Post(ElasticsearchObjectType):

    class Meta(object):
        document = PostDocument
        interfaces = (Node,)
        filter_backends = [
            FilteringFilterBackend,
            SearchFilterBackend,
            OrderingFilterBackend,
            DefaultOrderingFilterBackend,
        ]

        # For `FilteringFilterBackend` backend
        filter_fields = {
            # The dictionary key (in this case `title`) is the name of
            # the corresponding GraphQL query argument. The dictionary
            # value could be simple or complex structure (in this case
            # complex). The `field` key points to the `title.raw`, which
            # is the field name in the Elasticsearch document
            # (`PostDocument`). Since `lookups` key is provided, number
            # of lookups is limited to the given set, while term is the
            # default lookup (as specified in `default_lookup`).
            'title': {
                'field': 'title.raw', # Field name in the Elastic doc
                # Available lookups
                'lookups': [
                    LOOKUP_FILTER_TERM,
                    LOOKUP_FILTER_TERMS,
                    LOOKUP_FILTER_PREFIX,
                    LOOKUP_FILTER_WILDCARD,
                    LOOKUP_QUERY_IN,
                    LOOKUP_QUERY_EXCLUDE,
                ],
                # Default lookup
                'default_lookup': LOOKUP_FILTER_TERM,
            },

            # The dictionary key (in this case `category`) is the name of
            # the corresponding GraphQL query argument. Since no lookups
            # or default_lookup is provided, defaults are used (all lookups
            # available, term is the default lookup). The dictionary value
            # (in this case `category.raw`) is the field name in the
            # Elasticsearch document (`PostDocument`).
            'category': 'category.raw',

            # The dictionary key (in this case `tags`) is the name of
            # the corresponding GraphQL query argument. Since no lookups
            # or default_lookup is provided, defaults are used (all lookups
            # available, term is the default lookup). The dictionary value
            # (in this case `tags.raw`) is the field name in the
            # Elasticsearch document (`PostDocument`).
            'tags': 'tags.raw',

            # The dictionary key (in this case `num_views`) is the name of
            # the corresponding GraphQL query argument. Since no lookups
            # or default_lookup is provided, defaults are used (all lookups
            # available, term is the default lookup). The dictionary value
```

(continues on next page)

(continued from previous page)

```

    # (in this case `num_views`) is the field name in the
    # Elasticsearch document (`PostDocument`).
    'num_views': 'num_views',
}

# For `SearchFilterBackend` backend
search_fields = {
    'title': {'boost': 4},
    'content': {'boost': 2},
    'category': None,
}

# For `OrderingFilterBackend` backend
ordering_fields = {
    # The dictionary key (in this case `tags`) is the name of
    # the corresponding GraphQL query argument. The dictionary
    # value (in this case `tags.raw`) is the field name in the
    # Elasticsearch document (`PostDocument`).
    'title': 'title.raw',

    # The dictionary key (in this case `created_at`) is the name of
    # the corresponding GraphQL query argument. The dictionary
    # value (in this case `created_at`) is the field name in the
    # Elasticsearch document (`PostDocument`).
    'created_at': 'created_at',

    # The dictionary key (in this case `num_views`) is the name of
    # the corresponding GraphQL query argument. The dictionary
    # value (in this case `num_views`) is the field name in the
    # Elasticsearch document (`PostDocument`).
    'num_views': 'num_views',
}

# For `DefaultOrderingFilterBackend` backend
ordering_defaults = (
    '-num_views', # Field name in the Elasticsearch document
    'title.raw', # Field name in the Elasticsearch document
)

# Query definition
class Query(graphene.ObjectType):
    all_post_documents = ElasticsearchConnectionField(Post)

# Schema definition
schema = graphene.Schema(query=Query)

```

13.1.2.1 filter_backends

The list of filter backends you want to enable on your schema.

The following filter backends are available at the moment:

- FilteringFilterBackend,
- SearchFilterBackend
- OrderingFilterBackend

- DefaultOrderingFilterBackend

graphene-elastic would dynamically transform your definitions into fields and arguments to use for searching, filtering, ordering, etc.

13.1.2.2 filter_fields

Used by FilteringFilterBackend backend.

It's dict with keys representing names of the arguments that would become available to the GraphQL as input for querying. The values of the dict would be responsible for precise configuration of the queries.

Let's review the following example:

```
'title': {
    'field': 'title.raw',
    'lookups': [
        LOOKUP_FILTER_TERM,
        LOOKUP_FILTER_TERMS,
        LOOKUP_FILTER_PREFIX,
        LOOKUP_FILTER_WILDCARD,
        LOOKUP_QUERY_IN,
        LOOKUP_QUERY_EXCLUDE,
    ],
    'default_lookup': LOOKUP_FILTER_TERM,
}
```

field

The field is the corresponding field of the Elasticsearch Document. In the example below it's title.raw.

```
class Post(Document):

    title = Text(
        fields={'raw': Keyword()}
    )
```

lookups

In the given example, the available lookups for the title.raw would be limited to term, terms, prefix, wildcard, in and exclude. The latter two are functional queries, as you often see such lookups in ORMs (such as Django) while the others are Elasticsearch native lookups.

In our query we would then explicitly specify the lookup name (term in the example below):

```
query PostsQuery {
  allPostDocuments(filter: {title: {term: "Elasticsearch 7.1 released!"}}) {
    edges {
      node {
        id
        title
        category
        content
        createdAt
        comments
      }
    }
  }
}
```

default_lookup

But we could also fallback to the `default_lookup` (term in the example below).

Sample query using `default_lookup`:

```

query PostsQuery {
  allPostDocuments(filter:{title:{value:"Elasticsearch 7.1 released!"}}) {
    edges {
      node {
        id
        title
        category
        content
        createdAt
        comments
      }
    }
  }
}

```

In the block `{title:{value:"Elasticsearch 7.1 released!"}}` the value would stand for the `default_lookup` value.

13.1.2.3 search_fields

Used by `SearchFilterBackend` backend.

13.1.2.4 ordering_fields

Used by `OrderingFilterBackend` backend.

Similarly to *filter_fields*, keys of the `dict` represent argument names that would become available to the GraphQL for queries. The value would be the field name of the corresponding Elasticsearch document.

13.1.2.5 ordering_defaults

Used by `DefaultOrderingFilterBackend`.

If no explicit ordering is given (in the GraphQL query), this would be the fallback - the default ordering. It's expected to be a list or a tuple with field names to be used as default ordering. For descending ordering, add `-` (minus sign) as prefix to the field name.

13.2 Quick start

13.2.1 Clone the repository

```

git clone git@github.com:barseghyanartur/graphene-elastic.git && cd graphene-elastic

```

13.2.2 Start Elasticsearch

```
docker-compose up elasticsearch
```

13.2.3 Install requirements

```
pip install -r requirements.txt
```

13.2.4 Populate dummy data

```
./scripts/populate_elasticsearch_data.sh
```

13.2.5 Run the test server

```
./scripts/run_flask.sh
```

13.2.6 Open the `graphiql` client the browser

```
http://127.0.0.1:8001/graphql
```

13.2.7 Make some experiments

```
{
  allPostDocuments {
    pageInfo {
      startCursor
      endCursor
      hasNextPage
      hasPreviousPage
    }
    edges {
      cursor
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

13.2.8 Run tests


```
./runtests.py
```

13.3 Search

Search in all fields:

```
query {
  allPostDocuments(
    search:{query:"Release Box"}
  ) {
    edges {
      node {
        category
        title
        content
      }
    }
  }
}
```

Search in specific fields:

```
query {
  allPostDocuments(
    search:{
      title:{value:"Release", boost:2},
      content:{value:"Box"}
    }
  ) {
    edges {
      node {
        category
        title
        content
      }
    }
  }
}
```

13.4 Filtering

13.4.1 Filter lookups

The following lookups are available:

- contains
- ends_with (or endsWith for camelCase)
- exclude
- exists
- gt

- gte
- in
- is_null (or isNull for camelCase)
- lt
- lte
- prefix
- range
- starts_with (or startsWith for camelCase)
- term
- terms
- wildcard

13.4.1.1 Filter lookup contains

```
query {
  allPostDocuments(filter:{category:{contains:"tho"}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

13.4.1.2 Filter lookup ends_with

Note: endsWith for camelCase.

```
query {
  allPostDocuments(filter:{category:{endsWith:"thon"}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

13.4.1.3 Filter lookup `exclude`

For a single term:

```
query {
  allPostDocuments(filter:{category:{exclude:"Python"}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

For multiple terms:

```
query {
  allPostDocuments(filter:{category:{exclude:["Python", "Django"]}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

13.4.1.4 Filter lookup `exists`

```
query {
  allPostDocuments(filter:{category:{exists:true}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

13.4.1.5 Filter lookup `gt`

Available value types are:

- decimal
- float
- int

- datetime
- date

```
query {
  allPostDocuments(filter:{numViews:{gt:{decimal:"100.05"}}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

13.4.1.6 Filter lookup gte

Same value types as in “gt”

```
query {
  allPostDocuments(filter:{numViews:{gte:{decimal:"100.05"}}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

13.4.1.7 Filter lookup in

```
query {
  allPostDocuments(filter:{tags:{in:["photography", "models"]}}) {
    edges {
      node {
        category
        title
        content
        numViews
        tags
      }
    }
  }
}
```

13.4.1.8 Filter lookup lt

Same value types as in “gt”

```

query {
  allPostDocuments(filter:{numViews:{lt:{date:"2019-10-09"}}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}

```

13.4.1.9 Filter lookup lte

Same value types as in “gt”

```

query {
  allPostDocuments(filter:{numViews:{lte:{date:"2009-10-09"}}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}

```

13.4.1.10 Filter lookup prefix

```

query {
  allPostDocuments(filter:{category:{prefix:"Pyth"}}) {
    edges {
      node {
        category
        title
        content
        numViews
        comments
      }
    }
  }
}

```

13.4.1.11 Filter lookup range

Same value types as in “gt” .. code-block:: javascript

```

query {
  allPostDocuments(filter:{numViews:{range:{

```

```

        lower:{decimal:"100.05"}, upper:{decimal:"200.05"}
      }) {
    edges {
      node { category title content numViews
    }
  }
}

```

13.4.1.12 Filter lookup starts_with

Note: startsWith for camelCase.

Alias for filter lookup “prefix”.

13.4.1.13 Filter lookup term

```

query {
  allPostDocuments(filter:{category:{term:"Python"}}) {
    edges {
      node {
        category
        title
        content
        numViews
        comments
      }
    }
  }
}

```

13.4.1.14 Filter lookup terms

```

query {
  allPostDocuments(filter:{category:{terms:["Python", "Django"]}}) {
    edges {
      node {
        category
        title
        content
        numViews
        comments
      }
    }
  }
}

```

13.4.1.15 Filter lookup wildcard

```
query {
  allPostDocuments(filter:{category:{wildcard:"*ytho*"}}) {
    edges {
      node {
        category
        title
        content
        numViews
        comments
      }
    }
  }
}
```

13.5 Post-filter backend

Works the same way as `FilteringFilterBackend`, but does not affect aggregations.

13.5.1 Filter lookups

The following lookups are available:

- `contains`
- `ends_with` (or `endsWith` for camelCase)
- `exclude`
- `exists`
- `gt`
- `gte`
- `in`
- `is_null` (or `isNull` for camelCase)
- `lt`
- `lte`
- `prefix`
- `range`
- `starts_with` (or `startsWith` for camelCase)
- `term`
- `terms`
- `wildcard`

13.5.1.1 Filter lookup contains

```
query {
  allPostDocuments(postFilter:{category:{contains:"tho"}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

13.5.1.2 Filter lookup ends_with

Note: endsWith for camelCase.

```
query {
  allPostDocuments(postFilter:{category:{endsWith:"thon"}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

13.5.1.3 Filter lookup exclude

For a single term:

```
query {
  allPostDocuments(postFilter:{category:{exclude:"Python"}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

For multiple terms:


```

query {
  allPostDocuments(postFilter:{category:{exclude:["Python", "Django"]}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}

```

13.5.1.4 Filter lookup exists

```

query {
  allPostDocuments(postFilter:{category:{exists:true}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}

```

13.5.1.5 Filter lookup gt

```

query {
  allPostDocuments(postFilter:{numViews:{gt:{decimal:"100"}}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}

```

13.5.1.6 Filter lookup gte

```

query {
  allPostDocuments(postFilter:{numViews:{gte:{decimal:"100"}}}) {
    edges {
      node {
        category
        title
        content

```

(continues on next page)

(continued from previous page)

```

        numViews
      }
    }
  }
}

```

13.5.1.7 Filter lookup in

```

query {
  allPostDocuments(postFilter:{tags:{in:["photography", "models"]}}) {
    edges {
      node {
        category
        title
        content
        numViews
        tags
      }
    }
  }
}

```

13.5.1.8 Filter lookup lt

```

query {
  allPostDocuments(postFilter:{numViews:{lt:{decimal:"200"}}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}

```

13.5.1.9 Filter lookup lte

```

query {
  allPostDocuments(postFilter:{numViews:{lte:{decimal:"200"}}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}

```

13.5.1.10 Filter lookup prefix

```

query {
  allPostDocuments(postFilter:{category:{prefix:"Pyth"}}) {
    edges {
      node {
        category
        title
        content
        numViews
        comments
      }
    }
  }
}

```

13.5.1.11 Filter lookup range

```

query {
  allPostDocuments(postFilter:{numViews:{range:{
    lower:{decimal:"100"},
    upper:{decimal:"200"}
  }}}) {
    edges {
      node {
        category
        title
        content
        numViews
      }
    }
  }
}

```

13.5.1.12 Filter lookup starts_with

Note: startsWith for camelCase.

Alias for filter lookup ‘prefix’.

13.5.1.13 Filter lookup term

```

query {
  allPostDocuments(postFilter:{category:{term:"Python"}}) {
    edges {
      node {
        category
        title
        content
        numViews
        comments
      }
    }
  }
}

```

(continues on next page)

(continued from previous page)

```
}
  }
}
}
```

13.5.1.14 Filter lookup terms

```
query {
  allPostDocuments(postFilter:{category:{terms:["Python", "Django"]}}) {
    edges {
      node {
        category
        title
        content
        numViews
        comments
      }
    }
  }
}
```

13.5.1.15 Filter lookup wildcard

```
query {
  allPostDocuments(postFilter:{category:{wildcard:"*ytho*"}}) {
    edges {
      node {
        category
        title
        content
        numViews
        comments
      }
    }
  }
}
```

13.6 Ordering

Possible choices are ASC and DESC.

```
query {
  allPostDocuments(
    filter:{category:{term:"Photography"}},
    ordering:{title:ASC}
  ) {
    edges {
      node {
        category
        title

```

(continues on next page)

(continued from previous page)

```

        content
        numViews
        tags
    }
}
}
}

```

Multiple values are allowed:

```

query {
  allPostDocuments(
    filter:{category:{term:"Photography"}},
    ordering:{numViews:DESC, createdAt:ASC}
  ) {
    edges {
      node {
        category
        title
        content
        numViews
        tags
      }
    }
  }
}

```

13.7 Highlight

Sample type definition:

```

from graphene import Node
from graphene_elastic import ElasticsearchObjectType
from graphene_elastic.filter_backends import HighlightFilterBackend

class Post(ElasticsearchObjectType):

    class Meta:

        document = PostDocument
        interfaces = (Node,)
        filter_backends = [
            # ...
            HighlightFilterBackend, # Important
            # ...
        ]

        # ...

        # For `HighlightFilterBackend` backend
        highlight_fields = {
            'title': {
                'enabled': True,
                'options': {

```

(continues on next page)

(continued from previous page)

```

        'pre_tags': ["<b>"],
        'post_tags': ["</b>"],
    },
    'content': {
        'options': {
            'fragment_size': 50,
            'number_of_fragments': 3
        }
    },
    'category': {},
}

# ...

```

Sample query:

```

query {
  allPostDocuments(
    search:{content:{value:"since"}, title:{value:"decide"}},
    highlight:[category, content]
  ) {
    edges {
      node {
        title
        content
        highlight
      }
      cursor
    }
  }
}

```

Sample response:

```

{
  "data": {
    "allPostDocuments": {
      "edges": [
        {
          "node": {
            "title": "PM decide.",
            "content": "Cut dog young only. Whole natural state Republican year.
↵\nFinancial oil current sea. Mind large similar probably lawyer since. Son control_
↵fire remember.",
            "highlight": {
              "title": [
                "PM <b>decide</b>."
              ],
              "content": [
                "Mind large similar probably lawyer <em>since</em>."
              ]
            }
          },
          "cursor": "YXJyYXljb25uZWN0aW9uOjA="
        },
        {

```

(continues on next page)

(continued from previous page)

```

        "node": {
            "title": "Many add.",
            "content": "Read almost consumer perform water. Really protect push send_
↪body wind. Training point since involve public last let new.",
            "highlight": {
                "content": [
                    "Training point <em>since</em> involve public last let new."
                ]
            },
            "cursor": "YXJyYXljb25uZWN0aW9uOjE="
        }
    }
}

```

13.8 Source

Source query is meant to lighten the Elasticsearch load by reducing amount of data sent around. Although GraphQL seems to have solved the issue between frontend and backend, Elasticsearch would still send all the data to the backend. That's where we might use the source backend.

Sample type definition:

```

from graphene import Node
from graphene_elastic import ElasticsearchObjectType
from graphene_elastic.filter_backends import SourceFilterBackend

class Post(ElasticsearchObjectType):

    class Meta:

        document = PostDocument
        interfaces = (Node,)
        filter_backends = [
            # ...
            SourceFilterBackend, # Important
            # ...
        ]

```

Sample query:

```

query {
  allPostDocuments(
    search:{content:{value:"alice"}, title:{value:"alice"}},
    source:[title, id]
  ) {
    edges {
      node {
        id
        title
        content
        category
        comments
      }
    }
  }
}

```

(continues on next page)

(continued from previous page)

```

    }
    cursor
  }
}
}

```

Sample response:

As you could see, although we do ask for more fields in the node `{...}` part, the requested fields are empty. We only get data in the fields we have specified in `source` (they are `title` and `id`).

```

{
  "data": {
    "allPostDocuments": {
      "edges": [
        {
          "node": {
            "id": "UG9zdDpvX0huUlcwQlhFYXJjd2RMc0w2aQ==",
            "title": "only Alice miss",
            "content": null,
            "category": null,
            "comments": []
          },
          "cursor": "YXJyYXljb25uZWN0aW9uOjA="
        },
        {
          "node": {
            "id": "UG9zdDpvZkhUlcwQlhFYXJjd2RMc0w1Nw==",
            "title": "prevent Alice citizen",
            "content": null,
            "category": null,
            "comments": []
          },
          "cursor": "YXJyYXljb25uZWN0aW9uOjE="
        }
      ]
    }
  }
}

```

13.9 Faceted search

Sample type definition (note the usage of `FacetedSearchFilterBackend` and `faceted_search_fields`).

```

from elasticsearch_dsl import DateHistogramFacet, RangeFacet
from graphene import Node
from graphene_elastic import ElasticsearchObjectType
from graphene_elastic.filter_backends import (
    FacetedSearchFilterBackend,
    # ...
)

from search_index.documents import Post as PostDocument

```

(continues on next page)

(continued from previous page)

```

class Post(ElasticsearchObjectType):

    class Meta:

        document = PostDocument
        interfaces = (Node,)
        filter_backends = [
            # ...
            FacetedSearchFilterBackend,
            # ...
        ]

        # For `FacetedSearchFilterBackend` backend
        faceted_search_fields = {
            'category': 'category.raw',
            'category_global': {
                'field': 'category.raw',
                # Setting `global` to True, makes the facet global
                'global': True,
            },
            'tags': {
                'field': 'tags.raw',
                'enabled': True, # Will appear in the list by default
                'global': True,
            },
            'created_at': {
                'field': 'created_at',
                'facet': DateHistogramFacet,
                'options': {
                    'interval': 'year',
                }
            },
            'num_views_count': {
                'field': 'num_views',
                'facet': RangeFacet,
                'options': {
                    'ranges': [
                        ("<10", (None, 10)),
                        ("11-20", (11, 20)),
                        ("20-50", (20, 50)),
                        (">50", (50, None)),
                    ]
                }
            },
        }

```

Sample GraphQL query:

```

query {
  allPostDocuments(
    search:{title:{value:"alice"}}
    facets:[category]
  ) {
    facets
    edges {
      node {
        id

```

(continues on next page)

(continued from previous page)

```
        title
        highlight
    }
}
}
```

Sample response:

```
{
  "data": {
    "allPostDocuments": {
      "facets": {
        "tags": {
          "doc_count": 9,
          "aggs": {
            "doc_count_error_upper_bound": 0,
            "sum_other_doc_count": 0,
            "buckets": [
              {
                "key": "photography",
                "doc_count": 7
              },
              {
                "key": "art",
                "doc_count": 6
              },
              {
                "key": "article",
                "doc_count": 5
              },
              {
                "key": "black and white",
                "doc_count": 5
              },
              {
                "key": "package",
                "doc_count": 5
              },
              {
                "key": "models",
                "doc_count": 4
              },
              {
                "key": "programming",
                "doc_count": 4
              }
            ]
          }
        }
      },
      "category": {
        "doc_count": 9,
        "aggs": {
          "doc_count_error_upper_bound": 0,
          "sum_other_doc_count": 0,
          "buckets": [
```

(continues on next page)

(continued from previous page)

```

        {
            "key": "Python",
            "doc_count": 3
        },
        {
            "key": "Model Photography",
            "doc_count": 2
        },
        {
            "key": "Django",
            "doc_count": 1
        },
        {
            "key": "Elastic",
            "doc_count": 1
        },
        {
            "key": "Machine Learning",
            "doc_count": 1
        },
        {
            "key": "MongoDB",
            "doc_count": 1
        }
    ]
}
},
"edges": [
    {
        "node": {
            "id": "UG9zdDpBVWNwVm0wQklwZ2dXbVlJTndOVA==",
            "title": "better Alice must",
            "highlight": {
                "title": [
                    "better <b>Alice</b> must"
                ]
            }
        }
    },
    ...
]
}
}
}

```

Note, that category appeared in the result because we explicitly requested so (in `facets: [category]`) and the tags are there because they have been enabled by default (in `faceted_search_fields`).

13.10 Pagination

13.10.1 Limits

By default, max number of fetched items is limited to 100. It's configurable. Set the `RELAY_CONNECTION_MAX_LIMIT` setting to the desired value.

13.10.2 Enforce *first* or *last*

You could force users to provide *first* or *last*. Set `RELAY_CONNECTION_ENFORCE_FIRST_OR_LAST` to `True` for that.

13.10.3 User controlled pagination

The following (standard) arguments are available:

- `first`
- `last`
- `before`
- `after`

Sample query to return all results (limited by `RELAY_CONNECTION_MAX_LIMIT` setting only):

```
{
  allPostDocuments {
    pageInfo {
      startCursor
      endCursor
      hasNextPage
      hasPreviousPage
    }
    edges {
      cursor
      node {
        category
        title
        content
        numViews
      }
    }
  }
}
```

Sample query to return first 12 results:

```
{
  allPostDocuments(first:12) {
    pageInfo {
      startCursor
      endCursor
      hasNextPage
      hasPreviousPage
    }
  }
}
```

(continues on next page)

(continued from previous page)

```

edges {
  cursor
  node {
    category
    title
    content
    numViews
  }
}
}
}

```

Sample query to return first 12 results after the given offset:

13.11 Custom filter backends

Filter backends can:

- Add new graphene input types to the (query) schema.
- Allow you to request additional information by adding new graphene fields to the schema.
- Alter current queryset.
- Alter slice, add additional information next to pageInfo and edges, such as facets, for example.

Let's learn by example on the SourceFilterBackend which allows us to apply source query to the current search queryset.

```

import enum
import graphene

from graphene_elastic.filter_backends.base import BaseBackend
from graphene_elastic.constants import DYNAMIC_CLASS_NAME_PREFIX

class SourceFilterBackend(BaseBackend):
    """Source filter backend."""

    prefix = 'source' # Name of the GraphQL query filter
    has_query_fields = True # Indicates whether backend has own filtering fields

    # The ``source_fields`` is the config options that we set on the
    # ``Post`` object type. In this case - absolutely optional.
    @property
    def source_fields(self):
        """Source filter fields."""
        return getattr(
            self.connection_field.type._meta.node._meta,
            'filter_backend_options',
            {}
        ).get('source_fields', {})

    # This is where we dynamically create GraphQL filter fields for this
    # backend.
    def get_backend_filtering_fields(self, items, is_filterable_func, get_type_func):
        """Construct backend fields.

```

(continues on next page)

(continued from previous page)

```

:param items:
:param is_filterable_func:
:param get_type_func:
:return:
"""
_keys = list(
    self.connection_field.type._meta.node._meta.fields.keys()
)
_keys.remove('_id')
params = zip(_keys, _keys)
return {
    self.prefix: graphene.Argument(
        graphene.List(
            graphene.Enum.from_enum(
                enum.Enum(
                    "{}{}{}BackendEnum".format(
                        DYNAMIC_CLASS_NAME_PREFIX,
                        self.prefix.title(),
                        self.connection_field.type.__name__
                    ),
                    params
                )
            )
        )
    )
}

# Some data normalisation.
def prepare_source_fields(self):
    """Prepare source fields.

    Possible structures:

        source_fields = ["title"]

    Or:

        search_fields = ["title", "author.*"]

    Or:

        source = {
            "includes": ["title", "author.*"],
            "excludes": [ "*.description" ]
        }

    :return: Filtering options.
    :rtype: dict
    """
    source_args = dict(self.args).get(self.prefix, [])

    source_fields = dict(self.source_fields)

    if source_args:
        return source_args
    return source_fields

```

(continues on next page)

(continued from previous page)

```

# This is where the queryset is being altered.
def filter(self, queryset):
    """Filter.

    :param queryset:
    :return:
    """
    source_fields = self.prepare_source_fields()

    if source_fields:
        queryset = queryset.source(source_fields)

    return queryset

```

13.12 Settings

Defaults are:

```

DEFAULTS = {
    "SCHEMA": None,
    "SCHEMA_OUTPUT": "schema.json",
    "SCHEMA_INDENT": 2,
    # "MIDDLEWARE": (),
    # Set to True if the connection fields must have
    # either the first or last argument
    "RELAY_CONNECTION_ENFORCE_FIRST_OR_LAST": False,
    # Max items returned in ConnectionFields / FilterConnectionFields
    "RELAY_CONNECTION_MAX_LIMIT": 100,
    "LOGGING_LEVEL": logging.ERROR,
}

```

See the example below to get a grasp on how to override:

```

import json
import logging
import os

DEFAULTS = {
    "SCHEMA": None,
    "SCHEMA_OUTPUT": "schema.json",
    "SCHEMA_INDENT": 2,
    # Set to True if the connection fields must have
    # either the first or last argument
    "RELAY_CONNECTION_ENFORCE_FIRST_OR_LAST": False,
    # Max items returned in ConnectionFields / FilterConnectionFields
    "RELAY_CONNECTION_MAX_LIMIT": 100,
    "LOGGING_LEVEL": logging.DEBUG,
}

os.environ.setdefault(
    "GRAPHENE_ELASTIC",
    json.dumps(DEFAULTS)
)

```

13.13 Running Elasticsearch

For development and testing purposes, it's often handy to be able to quickly switch between different Elasticsearch versions. You could make use of the following boxes/containers for development and testing.

For all containers/boxes mentioned below, no authentication is required (for Elasticsearch).

13.13.1 Docker

13.13.1.1 Project default

```
docker-compose up elasticsearch
```

13.13.1.2 Run specific version

13.13.1.2.1 6.x

6.3.2

```
docker pull docker.elastic.co/elasticsearch/elasticsearch:6.3.2
docker run -p 9200:9200 -e "discovery.type=single-node" -e "xpack.security.
↪enabled=false" docker.elastic.co/elasticsearch/elasticsearch:6.3.2
```

6.4.0

```
docker pull docker.elastic.co/elasticsearch/elasticsearch:6.4.0
docker run -p 9200:9200 -e "discovery.type=single-node" -e "xpack.security.
↪enabled=false" docker.elastic.co/elasticsearch/elasticsearch:6.4.0
```

13.13.1.2.2 7.x

7.1.1

```
docker pull docker.elastic.co/elasticsearch/elasticsearch:7.1.1
docker run -p 9200:9200 -e "discovery.type=single-node" -e "xpack.security.
↪enabled=false" docker.elastic.co/elasticsearch/elasticsearch:7.1.1
```

13.14 FAQ

You will find a lot of useful information in the [documentation](#).

Additionally, all raised issues that were questions have been marked as *question*, so you could take a look at the [closed \(question\) issues](#).

13.14.1 Questions and answers

13.15 Debugging

The `LOGGING_LEVEL` key represents the logging level (defaults to `logging.ERROR`). Override if needed.

Typical development setup would be:

```
import json
import logging
import os

DEFAULTS = {
    # ...
    "LOGGING_LEVEL": logging.DEBUG,
    # ...
}

os.environ.setdefault(
    "GRAPHENE_ELASTIC",
    json.dumps(DEFAULTS)
)
```

13.16 Release history and notes

Sequence based identifiers are used for versioning (schema follows below):

```
major.minor[.revision]
```

- It's always safe to upgrade within the same minor version (for example, from 0.3 to 0.3.4).
- Minor version changes might be backwards incompatible. Read the release notes carefully before upgrading (for example, when upgrading from 0.3.4 to 0.4).
- All backwards incompatible changes are mentioned in this document.

13.16.1 0.6

2019-10-10

Note: Release dedicated to John Lennon. Happy birthday, dear John!

Note: This release introduces minor backwards incompatibility for `range`, `gt`, `gte`, `lt` and `lte` filters. You should update your code.

- The `range`, `gt`, `gte`, `lt` and `lte` filters are now complex input types. This makes it possible to use the following types in comparison: `decimal.Decimal`, `float`, `int`, `datetime.datetime` and `datetime.date`.

13.16.2 0.5

2019-09-29

- PostFilter backend.
- Documentation improvements.

13.16.3 0.4

2019-09-23

- Added faceted search backend (with global aggregations support).
- Some refactoring which makes possible for the backends to alter the connection. A lot of minor changes. If you have written custom filter backend, you most likely need to modify some parts.

13.16.4 0.3

2019-09-20

- Minor refactoring allowing third-party independent backends do a lot more without touching the core.
- Source filter backend.
- More tests.

13.16.5 0.2

2019-09-18

- Highlight filter backend.

13.16.6 0.1

2019-09-08

- Documentation fixes.
- Speed up tests.
- Clean up requirements.

13.16.7 0.0.13

2019-09-07

- Documentation improvements and fixes.
- Clean up.

13.16.8 0.0.12

2019-09-06

Note: In memory of Erik Slim. RIP.

- More tests.

13.16.9 0.0.11

2019-09-05

- Fixes in search backend.

13.16.10 0.0.10

2019-09-04

- Fixes.
- Clean up.

13.16.11 0.0.9

2019-09-03

- Added pagination.
- Documentation improvements.

13.16.12 0.0.8

2019-09-02

- Tested default ordering backend.
- Documentation improvements.

13.16.13 0.0.7

2019-09-01

- Ordering backend.
- Added more filter lookups.
- Minor fixes in existing filter lookups.
- Improved test coverage for the filtering backend.
- Documentation improvements.

13.16.14 0.0.6

2019-08-30

- Added more filter lookups.
- Fixes in filtering backend.
- Improved test coverage for the filtering backend.
- Documentation improvements.

13.16.15 0.0.5

2019-08-30

- Implemented custom lookups in favour of a single `lookup` attribute.
- Updated tests.

13.16.16 0.0.4

2019-08-28

- Fixed travis config (moved to elasticsearch 6.x on travis, since 7.x was causing problems).
- Fixes in setup.py.

13.16.17 0.0.3

2019-08-26

- Documentation fixes.
- Add test suite and initial tests for filter backend and search backend.

13.16.18 0.0.2

2019-08-25

- Added dynamic lookup generation for the filter backend.
- Working lookup param argument handling on the schema (filter backend).

13.16.19 0.0.1

2019-08-24

- Initial alpha release.

13.17 graphene_elastic package

13.17.1 Subpackages

13.17.1.1 graphene_elastic.filter_backends package

13.17.1.1.1 Subpackages

13.17.1.1.1.1 graphene_elastic.filter_backends.filtering package

13.17.1.1.1.2 Submodules

13.17.1.1.1.3 graphene_elastic.filter_backends.filtering.common module

class graphene_elastic.filter_backends.filtering.common.**FilteringFilterBackend**(*connection_field*,
args=None)

Bases: `graphene_elastic.filter_backends.base.BaseBackend`, `graphene_elastic.filter_backends.filtering.mixins.FilteringFilterMixin`

Filtering filter backend.

field_belongs_to(*field_name*)

Check if given filter field belongs to the backend.

Parameters *field_name* –

Returns

filter(*queryset*)

Filter.

filter_args_mapping

filter_fields

Filtering filter fields.

get_backend_query_fields(*items*, *is_filterable_func*, *get_type_func*)

Fail proof override.

Parameters

- *items* –
- *is_filterable_func* –
- *get_type_func* –

Returns

get_field_lookup_param(*field_name*)

Get field lookup param.

Parameters *field_name* –

Returns

get_field_options(*field_name*)

Get field option params.

Parameters *field_name* –

Returns**get_field_type** (*field_name*, *field_value*, *base_field_type*)

Get field type.

Returns**get_filter_query_params** ()

Get query params to be filtered on.

We can either specify it like this:

```
query_params = {
    'category': { 'value': 'Elastic',
    }
}
```

Or using specific lookup:

```
query_params = {
    'category': { 'term': 'Elastic', 'range': {
        'lower': Decimal('3.0')
    }
    }
}
```

Note, that *value* would only work on simple types (string, integer, decimal). For complex types you would have to use complex param anyway. Therefore, it should be forbidden to set *default_lookup* to a complex field type.

Sample values:

```
query_params = {
    'category': { 'value': 'Elastic',
    }
}

filter_fields = {
    'category': { 'field': 'category.raw', 'default_lookup': 'term', 'lookups': (
        'term', 'terms', 'range', 'exists', 'prefix', 'wildcard', 'contains', 'in', 'gt', 'gte', 'lt',
        'lte', 'starts_with', 'ends_with', 'is_null', 'exclude'
    )
    }
}

field_name = 'category'

has_query_fields = True

prefix = 'filter'
```

prepare_filter_fields()

Prepare filter fields.

Possible structures:

```
filter_fields = {
    'title': { 'field': 'title.raw', 'lookups': [
        LOOKUP_FILTER_TERM, LOOKUP_FILTER_TERMS,
        LOOKUP_FILTER_PREFIX, LOOKUP_FILTER_WILDCARD,
        LOOKUP_QUERY_IN, LOOKUP_QUERY_EXCLUDE,
    ], 'default_lookup': LOOKUP_FILTER_TERM,
    }, 'category': 'category.raw',
}
```

We shall finally have:

```
filter_fields = {
    'title': { 'field': 'title.raw', 'lookups': [
        LOOKUP_FILTER_TERM, LOOKUP_FILTER_TERMS,
        LOOKUP_FILTER_PREFIX, LOOKUP_FILTER_WILDCARD,
        LOOKUP_QUERY_IN, LOOKUP_QUERY_EXCLUDE,
    ], 'default_lookup': LOOKUP_FILTER_TERM,
    }, 'category': {
        'field': 'category.raw', 'lookups': [
            LOOKUP_FILTER_TERM, LOOKUP_FILTER_TERMS,
            LOOKUP_FILTER_PREFIX, LOOKUP_FILTER_WILDCARD,
            LOOKUP_QUERY_IN, LOOKUP_QUERY_EXCLUDE, ... # All other
            lookups
        ], 'default_lookup': LOOKUP_FILTER_TERM,
    }
}
```

prepare_query_params()

Prepare query params.

Returns

13.17.1.1.1.4 Module contents

13.17.1.1.1.5 graphene_elastic.filter_backends.search package

13.17.1.1.1.6 Submodules

13.17.1.1.1.7 graphene_elastic.filter_backends.search.common module

class graphene_elastic.filter_backends.search.common.**SearchFilterBackend**(*connection_field*,
args=None)

Bases: *graphene_elastic.filter_backends.base.BaseBackend*

Search filter backend.

construct_search()

Construct search.

We have to deal with two types of structures:

Type 1:

```
>>> search_fields = (
>>>     'title',
>>>     'description',
>>>     'summary',
>>> )
```

Type 2:

```
>>> search_fields = {
>>>     'title': {'field': 'title', 'boost': 2},
>>>     'description': None,
>>>     'summary': None,
>>> }
```

In GraphQL shall be:

```
query {
  allPostDocuments(search:{
    query:"Another", title:{value:"Another"} summary:{value:"Another"}
  }) { pageInfo {
    startCursor endCursor hasNextPage hasPreviousPage
  } edges {
    cursor node {
      category title content numViews
    }
  }
}
```

Or simply:

```
query {
  allPostDocuments(search:{query:"education technology"}) {
    pageInfo { startCursor endCursor hasNextPage hasPreviousPage
  } edges {
    cursor node {
      category title content numViews
    }
  }
}
```



```
    }
}
```

Returns Updated queryset.

Return type elasticsearch_dsl.search.Search

field_belongs_to (*field_name*)

Check if given filter field belongs to the backend.

Parameters *field_name* –

Returns

filter (*queryset*)

Filter.

Parameters *queryset* –

Returns

get_all_query_params ()

get_backend_default_query_fields_params ()

Get backend default filter params.

Return type dict

Returns

get_field_type (*field_name*, *field_value*, *base_field_type*)

Get field type.

Returns

has_query_fields = True

prefix = 'search'

prepare_search_fields ()

Prepare search fields.

Possible structures:

```
search_fields = { 'title': { 'boost': 4, 'field': 'title.raw' }, 'content': { 'boost': 2 }, 'category':
    None,
}
```

We shall finally have:

```
search_fields = {
    'title': { 'field': 'title.raw', 'boost': 4
    }, 'content': {
        'field': 'content', 'boost': 2
    }, 'category': {
        'field': 'category'
    }
}
```

Sample query would be:

```
{
  allPostDocuments(search:{query:"Another"}) {
    pageInfo { startCursor endCursor hasNextPage hasPreviousPage
    } edges {
      cursor node {
        category title content numViews
      }
    }
  }
}
```

Returns Filtering options.

Return type dict

search_args_mapping

search_fields

Search filter fields.

13.17.1.1.1.8 Module contents

13.17.1.1.1.2 Submodules

13.17.1.1.1.3 graphene_elastic.filter_backends.base module

class graphene_elastic.filter_backends.base.**BaseBackend** (*connection_field*,
args=None)

Bases: object

Base backend.

alter_connection (*connection*, *slice*)

Alter connection object.

You can add various properties here, returning the altered object. Typical use-case would be adding facets to the connection.

Parameters

- **connection** –
- **slice** –

Returns

classmethod **apply_filter** (*queryset*, *options=None*, *args=None*, *kwargs=None*)

Apply filter.

Parameters

- **queryset** –

- **options** –
- **args** –
- **kwargs** –

Returns

classmethod **apply_query** (*queryset, options=None, args=None, kwargs=None*)

Apply query.

Parameters

- **queryset** –
- **options** –
- **args** –
- **kwargs** –

Returns

doc_type

Shortcut to the Elasticsearch document type.

Returns

field_belongs_to (*field_name*)

Check if given filter field belongs to the backend.

Parameters **field_name** –

Returns

filter (*queryset*)

Filter. This method alters current queryset.

Parameters **queryset** –

Returns

classmethod **generic_query_fields** ()

Generic backend specific query fields.

For instance, for search filter backend it would be { 'search': String() }.

Returns

Rtype dict

get_backend_connection_fields ()

Get backend connection fields.

Typical use-case - a backend that alters the Connection object and adds additional fields next to *edges* and *pageInfo* (see the *graphene_elastic.relay.connection.Connection* for more information).

Rtype dict

Returns

get_backend_connection_fields_type ()

Get backend connection fields type.

Typical use-case - a backend that alters the Connection object and adds additional fields next to *edges* and *pageInfo* (see the *graphene_elastic.relay.connection.Connection* for more information).

Returns

get_backend_default_query_fields_params()

Get default query fields params for the backend.

Return type dict

Returns

get_backend_document_fields()

Get additional document fields for the backend.

For instance, the `Highlight` backend add additional field named `highlight` to the list of fields.

Sample query:

```
query {
  allPostDocuments(search:{title:{value:"alice"}}) {
    edges {
      node { id title highlight
    }
  }
}
```

Sample response:

```
{
  "data": {
    "allPostDocuments": {
      "edges": [
        {
          "node": { "id": "UG9zdDp5a1ppVlcwQklwZ2dXbVlJQV9lRw==", "title":
            "thus Alice style", "highlight": {
              "title": [ "thus <b>Alice</b> style"
            ]
          }
        }
      ]
    }
  }
}
```

That `highlight` part on both sample query and sample response isn't initially available on the connection level, but added with help of the filter backend. :return:

get_backend_query_fields(items, is_filterable_func, get_type_func)

Construct backend query fields.

Parameters

- **items** –
- **is_filterable_func** –

- **get_type_func** –

Returns

get_field_type (*field_name*, *field_value*, *base_field_type*)

Get field type.

Returns

has_connection_fields = **False**

has_query_fields = **False**

prefix = **None**

classmethod split_lookup_complex_multiple_value (*value*, *maxsplit=-1*)

Split lookup complex multiple value.

Parameters

- **value** (*str*) – Value to split.
- **maxsplit** (*int*) – The *maxsplit* option of *string.split*.

Returns Lookup filter split into a list.

Return type list

classmethod split_lookup_complex_value (*value*, *maxsplit=-1*)

Split lookup complex value.

Parameters

- **value** (*str*) – Value to split.
- **maxsplit** (*int*) – The *maxsplit* option of *string.split*.

Returns Lookup filter split into a list.

Return type list

classmethod split_lookup_filter (*value*, *maxsplit=-1*)

Split lookup filter.

Parameters

- **value** (*str*) – Value to split.
- **maxsplit** (*int*) – The *maxsplit* option of *string.split*.

Returns Lookup filter split into a list.

Return type list

classmethod split_lookup_name (*value*, *maxsplit=-1*)

Split lookup value.

Parameters

- **value** (*str*) – Value to split.
- **maxsplit** (*int*) – The *maxsplit* option of *string.split*.

Returns Lookup value split into a list.

Return type list

13.17.1.1.4 Module contents

13.17.1.2 graphene_elastic.types package

13.17.1.2.1 Submodules

13.17.1.2.2 graphene_elastic.types.elastic_types module

`graphene_elastic.types.elastic_types.construct_fields` (*document*, *registry*,
only_fields, *exclude_fields*)

Args: document (elasticsearch_dsl.Document): registry (graphene_elastic.registry.Registry): only_fields ([str]): exclude_fields ([str]):

Returns: (OrderedDict, OrderedDict): converted fields and self reference fields.

```
graphene_elastic.types.elastic_types.construct_self_referenced_fields(self_referenced,
                                                                    registry)

class graphene_elastic.types.elastic_types.ElasticsearchObjectTypeOptions(class_type)
    Bases: graphene.types.objecttype.ObjectTypeOptions

    connection = None

    document = None

    registry = None

class graphene_elastic.types.elastic_types.ElasticsearchObjectType(*args,
                                                                    **kwargs)
    Bases: graphene.types.objecttype.ObjectType

    classmethod get_node(info, id)
    id
    classmethod is_type_of(root, info)
    classmethod rescan_fields()
        Attempts to rescan fields and will insert any not converted initially.
    resolve_id(info)
```

13.17.1.2.3 graphene_elastic.types.json_string module

```
class graphene_elastic.types.json_string.JSONString(*args, **kwargs)
    Bases: graphene.types.json.JSONString

    static serialize(dt)

graphene_elastic.types.json_string.to_serializable(o)
```

13.17.1.2.4 Module contents

13.17.2 Submodules

13.17.3 graphene_elastic.advanced_types module

```
class graphene_elastic.advanced_types.FileFieldType(*args, **kwargs)
    Bases: graphene.types.objecttype.ObjectType

    chunk_size = <graphene.types.scalars.Int object>

    content_type = <graphene.types.scalars.String object>

    data = <graphene.types.scalars.String object>

    length = <graphene.types.scalars.Int object>

    md5 = <graphene.types.scalars.String object>

    resolve_chunk_size(info)
```

```

    resolve_content_type (info)
    resolve_data (info)
    resolve_length (info)
    resolve_md5 (info)
class graphene_elastic.advanced_types.MultiPolygonFieldType (*args, **kwargs)
    Bases: graphene_elastic.advanced_types._CoordinatesTypeField
    coordinates = <graphene.types.structures.List object>
class graphene_elastic.advanced_types.PointFieldType (*args, **kwargs)
    Bases: graphene_elastic.advanced_types._CoordinatesTypeField
    coordinates = <graphene.types.structures.List object>
class graphene_elastic.advanced_types.PolygonFieldType (*args, **kwargs)
    Bases: graphene_elastic.advanced_types._CoordinatesTypeField
    coordinates = <graphene.types.structures.List object>

```

13.17.4 graphene_elastic.constants module

Constants module. Contains Elasticsearch constants, lookup constants, functional constants, suggesters, etc.

13.17.5 graphene_elastic.converter module

```

exception graphene_elastic.converter.ElasticsearchConversionError
    Bases: Exception
graphene_elastic.converter.convert_elasticsearch_field (field, registry=None)
graphene_elastic.converter.convert_field_to_boolean (field, registry=None)
graphene_elastic.converter.convert_field_to_datetime (field, registry=None)
graphene_elastic.converter.convert_field_to_float (field, registry=None)
graphene_elastic.converter.convert_field_to_int (field, registry=None)
graphene_elastic.converter.convert_field_to_jsonstring (field, registry=None)
graphene_elastic.converter.convert_field_to_string (field, registry=None)

```

13.17.6 graphene_elastic.enums module

```

class graphene_elastic.enums.NoValue
    Bases: enum.Enum
    String values in enum.

```

Example:

```

>>> class Color(NoValue):
>>>     RED = 'stop'
>>>     GREEN = 'go'
>>>     BLUE = 'too fast!'

```

Graphene example:

```
>>> @graphene.Enum.from_enum
>>> class ColorOptions(NoValue):
>>>
>>>     RED = 'stop'
>>>     GREEN = 'go'
>>>     BLUE = 'too fast!'
```

`graphene_elastic.enums.convert_list_to_enum(values, enum_name='DynamicEnum', upper=True)`

Prepare list values for creating an Enum.

Example:

```
>>> values = ['red', 'green', 'blue']
>>> print(prepare_list_for_enum(values))
{'RED': 'red', 'GREEN': 'green', 'BLUE': 'blue'}
```

13.17.7 graphene_elastic.fields module

```
class graphene_elastic.fields.ElasticsearchConnectionField(type, *args,
                                                            **kwargs)
    Bases: graphene.relay.connection.IterableConnectionField
    args
    chained_resolver(resolver, is_partial, root, info, **args)
    classmethod connection_resolver(resolver, connection_type, root, info, connection_field=None, **args)
    default_filter_backends
    default_resolver(_root, info, **args)
    doc_type
    document
    field_args
    fields
    filter_backends
    get_queryset(document, info, **args)
    get_resolver(parent_resolver)
    node_type
    reference_args
    registry
    classmethod resolve_connection(connection_type, args, resolved, connection_field=None)
    type
```

13.17.8 graphene_elastic.helpers module

`graphene_elastic.helpers.to_camel_case(snake_str: str) → str`
 Convert snake_case to camelCase.

Capitalize the first letter of each part except the first one with the *capitalize* method and join all the parts together.

Adapted from this response in StackOverflow <http://stackoverflow.com/a/19053800/1072990>

Parameters `snake_str` –

Returns

`graphene_elastic.helpers.to_pascal_case(snake_str: str) → str`

Convert snake_case to CapWords.

Parameters `snake_str` –

Returns

13.17.9 graphene_elastic.registry module

class `graphene_elastic.registry.Registry`

Bases: `object`

get_converted_field (*field*)

get_type_for_document (*document*)

register (*cls*)

register_converted_field (*field*, *converted*)

`graphene_elastic.registry.get_global_registry()`

`graphene_elastic.registry.reset_global_registry()`

13.17.10 graphene_elastic.settings module

13.17.11 graphene_elastic.utils module

`graphene_elastic.utils.get_document_fields(document, excluding=None)`

`graphene_elastic.utils.get_field_description(field, registry=None)`

Common metadata includes `verbose_name` and `help_text`.

<http://docs.mongoose.org/apireference.html#fields>

`graphene_elastic.utils.get_node_from_global_id(node, info, global_id)`

`graphene_elastic.utils.get_type_for_document(schema, document)`

`graphene_elastic.utils.import_single_dispatch()`

`graphene_elastic.utils.is_valid_elasticsearch_document(document)`

13.17.12 Module contents

class `graphene_elastic.ElasticsearchConnectionField` (*type*, **args*, ***kwargs*)

Bases: `graphene.relay.connection.IterableConnectionField`

args

chained_resolver (*resolver*, *is_partial*, *root*, *info*, ***args*)

classmethod **connection_resolver** (*resolver*, *connection_type*, *root*, *info*, *connection_field*=None, ***args*)

default_filter_backends

```
default_resolver(_root, info, **args)
doc_type
document
field_args
fields
filter_backends
get_queryset(document, info, **args)
get_resolver(parent_resolver)
node_type
reference_args
registry
classmethod resolve_connection(connection_type, args, resolved, connection_field=None)
type
class graphene_elastic.ElasticsearchObjectType(*args, **kwargs)
    Bases: graphene.types.objecttype.ObjectType
    classmethod get_node(info, id)
    id
    classmethod is_type_of(root, info)
    classmethod rescan_fields()
        Attempts to rescan fields and will insert any not converted initially.
    resolve_id(info)
```

CHAPTER 14

Indices and tables

- `genindex`
- `modindex`
- `search`

g

- `graphene_elastic`, [83](#)
- `graphene_elastic.advanced_types`, [80](#)
- `graphene_elastic.constants`, [81](#)
- `graphene_elastic.converter`, [81](#)
- `graphene_elastic.enums`, [81](#)
- `graphene_elastic.fields`, [82](#)
- `graphene_elastic.filter_backends`, [79](#)
- `graphene_elastic.filter_backends.base`,
[76](#)
- `graphene_elastic.filter_backends.filtering`,
[73](#)
- `graphene_elastic.filter_backends.filtering.common`,
[71](#)
- `graphene_elastic.filter_backends.search`,
[76](#)
- `graphene_elastic.filter_backends.search.common`,
[73](#)
- `graphene_elastic.helpers`, [82](#)
- `graphene_elastic.registry`, [83](#)
- `graphene_elastic.settings`, [83](#)
- `graphene_elastic.types`, [80](#)
- `graphene_elastic.types.elastic_types`,
[79](#)
- `graphene_elastic.types.json_string`, [80](#)
- `graphene_elastic.utils`, [83](#)

A

`alter_connection()`
 (`graphene_elastic.filter_backends.base.BaseBackend`
 method), 76
`apply_filter()` (`graphene_elastic.filter_backends.base.BaseBackend`
 class method), 76
`apply_query()` (`graphene_elastic.filter_backends.base.BaseBackend`
 class method), 77
`args` (`graphene_elastic.ElasticsearchConnectionFactory`
 attribute), 83
`args` (`graphene_elastic.fields.ElasticsearchConnectionFactory`
 attribute), 82

B

`BaseBackend` (class in
 `graphene_elastic.filter_backends.base`), 76

C

`chained_resolver()`
 (`graphene_elastic.ElasticsearchConnectionFactory`
 method), 83
`chained_resolver()`
 (`graphene_elastic.fields.ElasticsearchConnectionFactory`
 method), 82
`chunk_size` (`graphene_elastic.advanced_types.FileFieldType`
 attribute), 80
`connection` (`graphene_elastic.types.elastic_types.ElasticsearchObjectTypeOptions`
 attribute), 80
`connection_resolver()`
 (`graphene_elastic.ElasticsearchConnectionFactory`
 class method), 83
`connection_resolver()`
 (`graphene_elastic.fields.ElasticsearchConnectionFactory`
 class method), 82
`construct_fields()` (in module
 `graphene_elastic.types.elastic_types`), 79
`construct_search()`
 (`graphene_elastic.filter_backends.search.common.SearchFilterBackend`
 method), 74

`construct_self_referenced_fields()` (in
 module `graphene_elastic.types.elastic_types`),
 80
`content_type` (`graphene_elastic.advanced_types.FileFieldType`
 attribute), 80
`convert_elasticsearch_field()` (in module
 `graphene_elastic.converter`), 81
`convert_field_to_boolean()` (in module
 `graphene_elastic.converter`), 81
`convert_field_to_datetime()` (in module
 `graphene_elastic.converter`), 81
`convert_field_to_float()` (in module
 `graphene_elastic.converter`), 81
`convert_field_to_int()` (in module
 `graphene_elastic.converter`), 81
`convert_field_to_jsonstring()` (in module
 `graphene_elastic.converter`), 81
`convert_field_to_string()` (in module
 `graphene_elastic.converter`), 81
`convert_list_to_enum()` (in module
 `graphene_elastic.enums`), 82
`coordinates` (`graphene_elastic.advanced_types.MultiPolygonFieldType`
 attribute), 81
`coordinates` (`graphene_elastic.advanced_types.PointFieldType`
 attribute), 81
`coordinates` (`graphene_elastic.advanced_types.PolygonFieldType`
 attribute), 81

D

`data` (`graphene_elastic.advanced_types.FileFieldType`
 attribute), 80
`default_filter_backends`
 (`graphene_elastic.ElasticsearchConnectionFactory`
 attribute), 83
`default_filter_backends`
 (`graphene_elastic.fields.ElasticsearchConnectionFactory`
 attribute), 82
`default_resolver()`
 (`graphene_elastic.ElasticsearchConnectionFactory`
 method), 83

[default_resolver\(\)](#) ([graphene_elastic.fields.ElasticsearchConnectionField](#) attribute), 82
[doc_type\(\)](#) ([graphene_elastic.ElasticsearchConnectionField](#) attribute), 84
[doc_type\(\)](#) ([graphene_elastic.fields.ElasticsearchConnectionField](#) attribute), 82
[doc_type\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) attribute), 77
[document\(\)](#) ([graphene_elastic.ElasticsearchConnectionField](#) attribute), 84
[document\(\)](#) ([graphene_elastic.fields.ElasticsearchConnectionField](#) attribute), 82
[document\(\)](#) ([graphene_elastic.types.elastic_types.ElasticsearchObjectTypeOptions](#) attribute), 80

E

[ElasticsearchConnectionField](#) (class in [graphene_elastic](#)), 83
[ElasticsearchConnectionField](#) (class in [graphene_elastic.fields](#)), 82
[ElasticsearchConversionError](#), 81
[ElasticsearchObjectType](#) (class in [graphene_elastic](#)), 84
[ElasticsearchObjectType](#) (class in [graphene_elastic.types.elastic_types](#)), 80
[ElasticsearchObjectTypeOptions](#) (class in [graphene_elastic.types.elastic_types](#)), 80

F

[field_args\(\)](#) ([graphene_elastic.ElasticsearchConnectionField](#) attribute), 84
[field_args\(\)](#) ([graphene_elastic.fields.ElasticsearchConnectionField](#) attribute), 82
[field_belongs_to\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) method), 77
[field_belongs_to\(\)](#) ([graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend](#) method), 71
[field_belongs_to\(\)](#) ([graphene_elastic.filter_backends.search.common.SearchFilterBackend](#) method), 75
[fields\(\)](#) ([graphene_elastic.ElasticsearchConnectionField](#) attribute), 84
[fields\(\)](#) ([graphene_elastic.fields.ElasticsearchConnectionField](#) attribute), 82
[FileFieldType](#) (class in [graphene_elastic.advanced_types](#)), 80
[filter\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) method), 77
[filter\(\)](#) ([graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend](#) method), 71
[filter\(\)](#) ([graphene_elastic.filter_backends.search.common.SearchFilterBackend](#) method), 75
[filter_args_mapping](#) ([graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend](#) attribute), 71
[filter_backends](#) ([graphene_elastic.ElasticsearchConnectionField](#) attribute), 84
[filter_backends](#) ([graphene_elastic.fields.ElasticsearchConnectionField](#) attribute), 82
[filter_fields](#) ([graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend](#) attribute), 71
[FilteringFilterBackend](#) (class in [graphene_elastic.filter_backends.filtering.common](#)), 71
[TypeOptions](#) ([graphene_elastic.types.elastic_types.ElasticsearchObjectTypeOptions](#) attribute), 80

G

[generic_query_fields\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) class method), 77
[get_all_query_params\(\)](#) ([graphene_elastic.filter_backends.search.common.SearchFilterBackend](#) method), 75
[get_backend_connection_fields\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) method), 77
[get_backend_connection_fields_type\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) method), 77
[get_backend_default_query_fields_params\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) method), 77
[get_backend_default_query_fields_params\(\)](#) ([graphene_elastic.filter_backends.search.common.SearchFilterBackend](#) method), 75
[get_backend_document_fields\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) method), 78
[get_backend_query_fields\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) method), 78
[get_backend_query_fields\(\)](#) ([graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend](#) method), 71
[get_backend_query_fields\(\)](#) ([graphene_elastic.filter_backends.search.common.SearchFilterBackend](#) method), 75
[get_converted_field\(\)](#) ([graphene_elastic.registry.Registry](#) method), 83
[get_document_fields\(\)](#) (in module [graphene_elastic.utils](#)), 83
[get_field_description\(\)](#) (in module [graphene_elastic.utils](#)), 83
[get_field_lookup_param\(\)](#) ([graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend](#) method), 71
[get_field_options\(\)](#) ([graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend](#) method), 71

`method`), 71
`get_field_type()` (`graphene_elastic.filter_backends.base.BaseBackend` (module)), 79
`method`), 79
`get_field_type()` (`graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend` (module)), 83
`method`), 72
`get_field_type()` (`graphene_elastic.filter_backends.search.common.SearchFilterBackend` (module)), 75
`method`), 75
`get_filter_query_params()` (`graphene_elastic.filter_backends.base.BaseBackend` (module)), 79
`(graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend` (module)), 79
`method`), 72
`get_global_registry()` (`in module graphene_elastic.registry`), 83
`has_connection_fields` (`graphene_elastic.filter_backends.base.BaseBackend` (module)), 79
`has_query_fields` (`graphene_elastic.filter_backends.base.BaseBackend` (module)), 79
`has_query_fields` (`graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend` (module)), 79
`has_query_fields` (`graphene_elastic.filter_backends.search.common.SearchFilterBackend` (module)), 75
`get_node()` (`graphene_elastic.ElasticsearchObjectType` class method), 84
`get_node()` (`graphene_elastic.types.elastic_types.ElasticsearchObjectType` class method), 75
`get_node_from_global_id()` (`in module graphene_elastic.utils`), 83
`id` (`graphene_elastic.ElasticsearchObjectType` attribute), 84
`id` (`graphene_elastic.types.elastic_types.ElasticsearchObjectType` attribute), 84
`import_single_dispatch()` (`in module graphene_elastic.utils`), 83
`is_type_of()` (`graphene_elastic.ElasticsearchObjectType` class method), 84
`is_type_of()` (`graphene_elastic.types.elastic_types.ElasticsearchObjectType` class method), 84
`is_valid_elasticsearch_document()` (`in module graphene_elastic.utils`), 83
`length` (`graphene_elastic.advanced_types.FileFieldType` attribute), 80
`md5` (`graphene_elastic.advanced_types.FileFieldType` attribute), 80
`MultiPolygonFieldType` (class `in graphene_elastic.advanced_types`), 81
`NoValue` (class `in graphene_elastic.enums`), 81
`PointFieldType` (class `in graphene_elastic.advanced_types`), 81
`registry.Registry` (module), 83
`settings` (module), 83
`types` (module), 80
`types.elastic_types` (module), 80

[PolygonFieldType](#) (class in [resolve_id\(\)](#) ([graphene_elastic.ElasticsearchObjectType](#) [graphene_elastic.advanced_types](#)), 81 [method](#)), 84
[prefix](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) [resolve_id\(\)](#) ([graphene_elastic.types.elastic_types.ElasticsearchObjectType](#) [attribute](#)), 79 [method](#)), 80
[prefix](#) ([graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend](#) ([graphene_elastic.advanced_types.FileFieldType](#) [attribute](#)), 72 [method](#)), 81
[prefix](#) ([graphene_elastic.filter_backends.search.common.SearchFilterBackend](#) ([graphene_elastic.advanced_types.FileFieldType](#) [attribute](#)), 75 [method](#)), 81
[prepare_filter_fields\(\)](#) ([graphene_elastic.filter_backends.filtering.common.FilteringFilterBackend](#) [method](#)), 72 [search_args_mapping](#)
[prepare_query_params\(\)](#) ([graphene_elastic.filter_backends.search.common.SearchFilterBackend](#) [method](#)), 73 [search_fields](#) ([graphene_elastic.filter_backends.search.common.SearchFilterBackend](#) [attribute](#)), 76
[prepare_search_fields\(\)](#) ([graphene_elastic.filter_backends.search.common.SearchFilterBackend](#) (class in [graphene_elastic.filter_backends.search.common](#)), 73
R [serialize\(\)](#) ([graphene_elastic.types.json_string.JSONString](#) [method](#)), 80
[reference_args](#) ([graphene_elastic.ElasticsearchConnectionField](#) [static method](#)), 80 [split_lookup_complex_multiple_value\(\)](#)
[reference_args](#) ([graphene_elastic.fields.ElasticsearchConnectionField](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) [attribute](#)), 82 [class method](#)), 79
[register\(\)](#) ([graphene_elastic.registry.Registry](#) [split_lookup_complex_value\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) [method](#)), 83 [class method](#)), 79
[register_converted_field\(\)](#) ([graphene_elastic.registry.Registry](#) [method](#)), 83 [split_lookup_filter\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) [method](#)), 79
[Registry](#) (class in [graphene_elastic.registry](#)), 83 [split_lookup_name\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) [method](#)), 79
[registry](#) ([graphene_elastic.ElasticsearchConnectionField](#) [class method](#)), 79
[registry](#) ([graphene_elastic.fields.ElasticsearchConnectionField](#) [attribute](#)), 82 [split_lookup_name\(\)](#) ([graphene_elastic.filter_backends.base.BaseBackend](#) [class method](#)), 79
[registry](#) ([graphene_elastic.types.elastic_types.ElasticsearchObjectTypeOptions](#) [attribute](#)), 80
T [rescan_fields\(\)](#) ([graphene_elastic.ElasticsearchObjectType](#) [method](#)), 84 [to_camel_case\(\)](#) (in [module](#) [graphene_elastic.helpers](#)), 82
[rescan_fields\(\)](#) ([graphene_elastic.types.elastic_types.ElasticsearchObjectType](#) [method](#)), 80 [to_pascal_case\(\)](#) (in [module](#) [graphene_elastic.helpers](#)), 83
[reset_global_registry\(\)](#) (in [module](#) [graphene_elastic.registry](#)), 83 [to_serializable\(\)](#) (in [module](#) [graphene_elastic.types.json_string](#)), 80
[resolve_chunk_size\(\)](#) ([graphene_elastic.advanced_types.FileFieldType](#) [type](#) ([graphene_elastic.ElasticsearchConnectionField](#) [attribute](#)), 84
[resolve_connection\(\)](#) ([graphene_elastic.ElasticsearchConnectionField](#) [class method](#)), 84 [type](#) ([graphene_elastic.fields.ElasticsearchConnectionField](#) [attribute](#)), 82
[resolve_connection\(\)](#) ([graphene_elastic.fields.ElasticsearchConnectionField](#) [class method](#)), 82
[resolve_content_type\(\)](#) ([graphene_elastic.advanced_types.FileFieldType](#) [method](#)), 80
[resolve_data\(\)](#) ([graphene_elastic.advanced_types.FileFieldType](#) [method](#)), 81