ActiveData

activedata.allizom.org

ActiveData

- Fast filtering
- Fast aggregates
- API is a query language
- Simple service

```
curl http://activedata.allizom.org/query -X POST -d
"{\"from\":\"unittest\"}"
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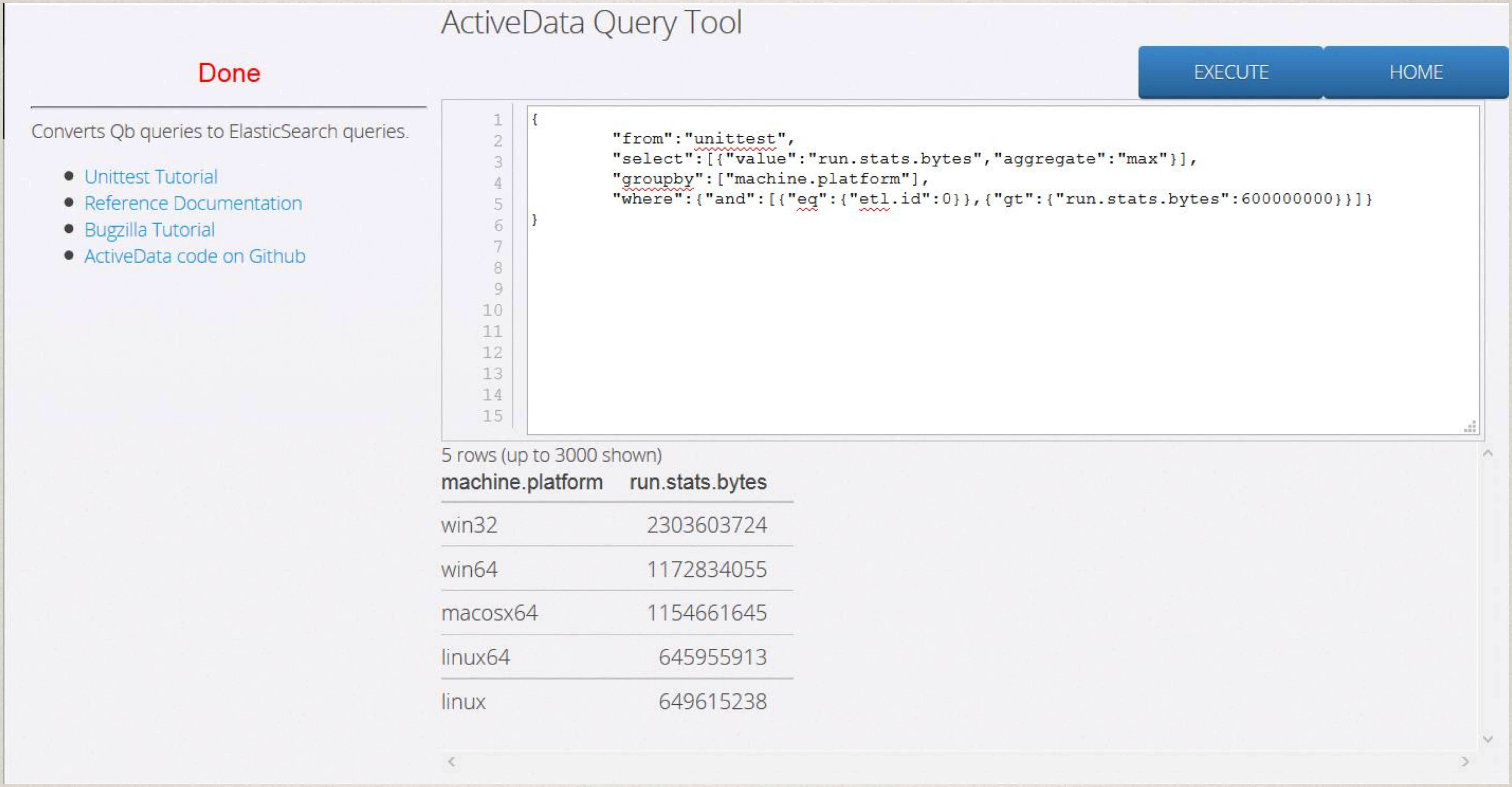
Wrangle large volume of data with small effort

Query Tool



ActiveData Query Tool

Done

Converts Qb queries to ElasticSearch queries.

- Unittest Tutorial
- Reference Documentation
- Bugzilla Tutorial
- ActiveData code on Github

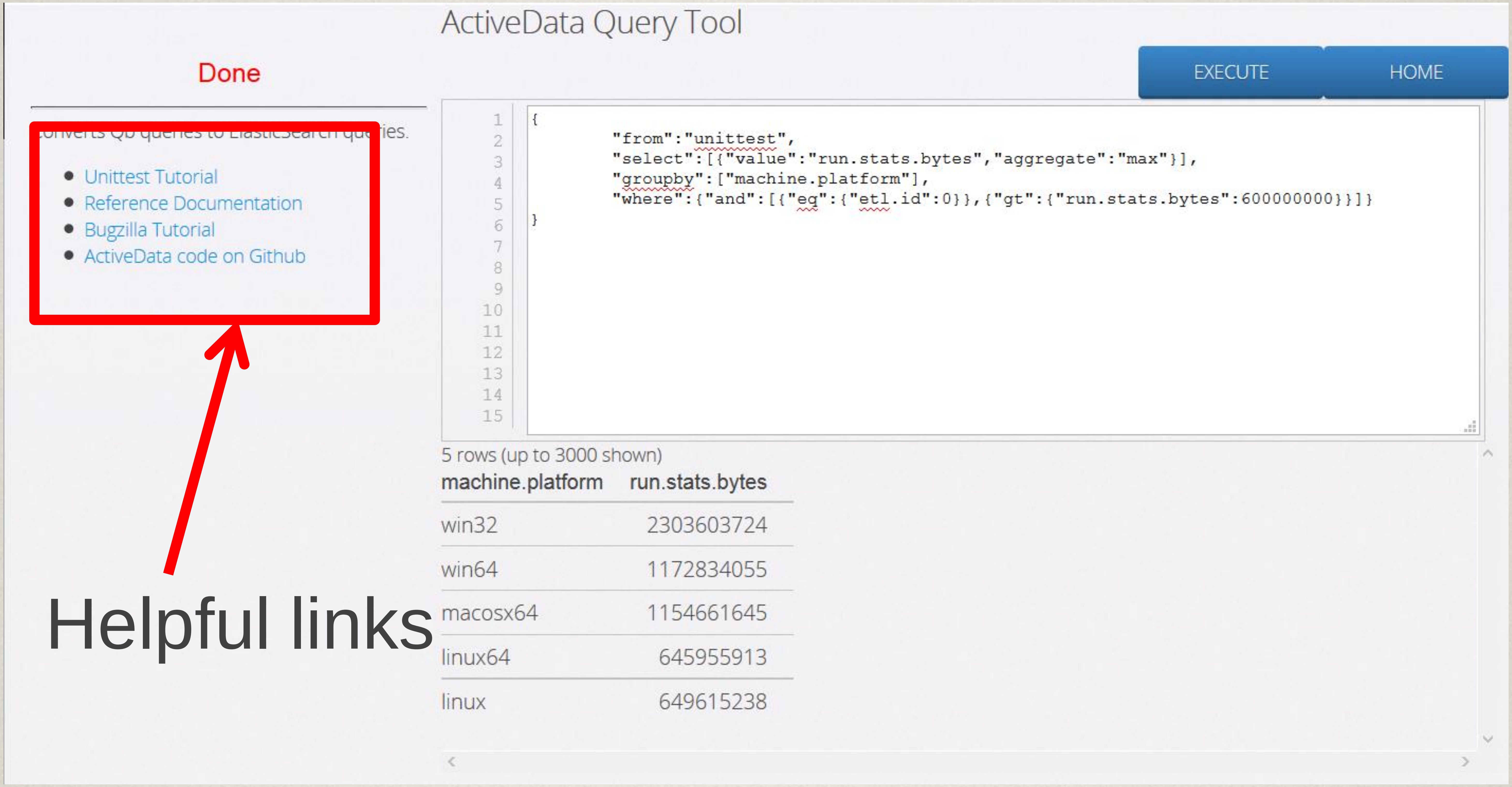
```
{
	"from":"unittest",
	"select":[{"value":"run.stats.bytes","aggregate":"max"}],
	"groupby":["machine.platform"],
	"where":{"and":[{"eq":{"etl.id":0}},{"gt":{"run.stats.bytes":600000000}}]}
}
```

5 rows (up to 3000 shown)

machine.platform	run.stats.bytes
win32	2303603724
win64	1172834055
macosx64	1154661645
linux64	645955913
linux	649615238

http://activedata.allizom.org/tools/query.html

Query Tool



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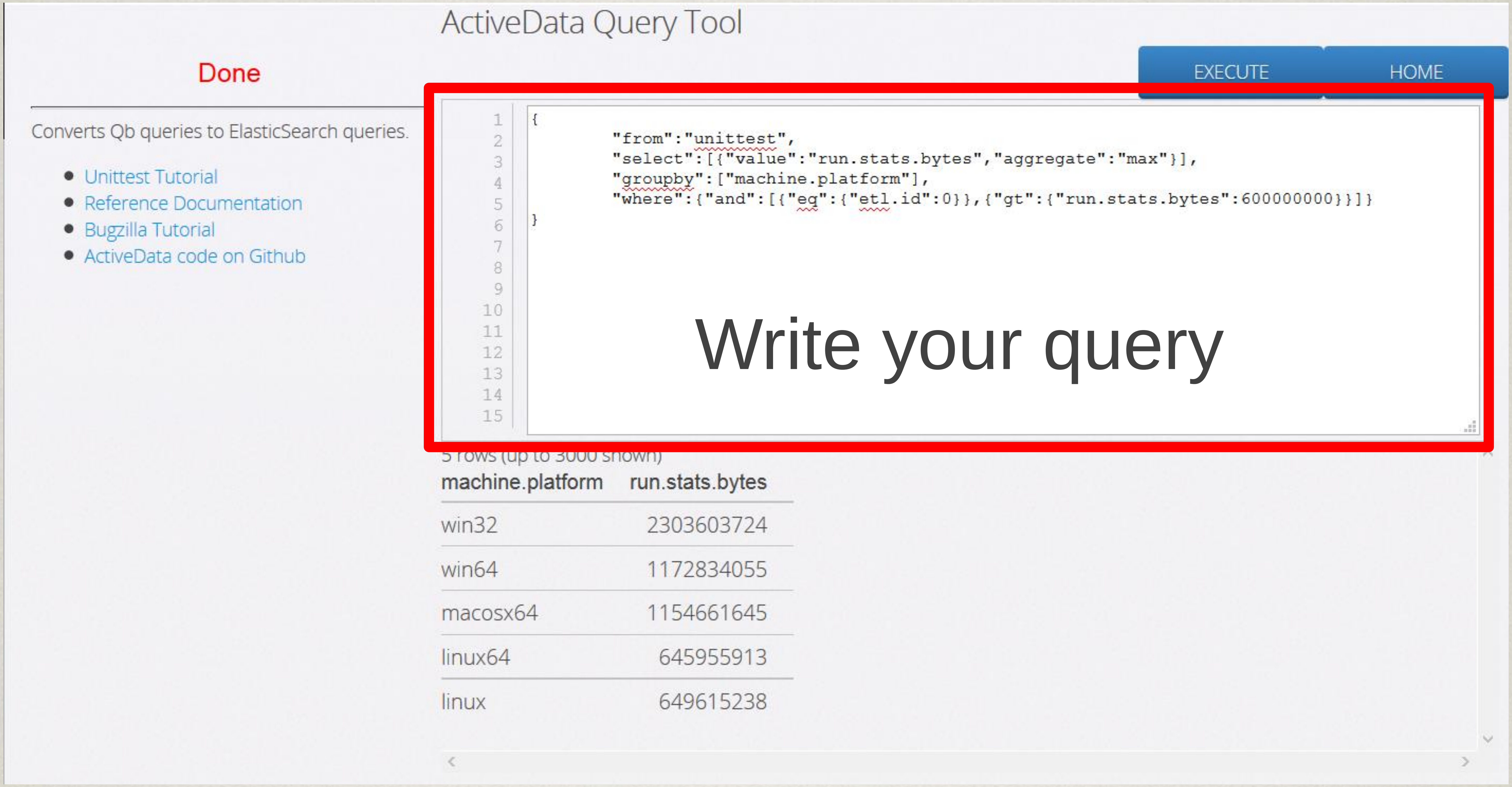
Helpful links

http://activedata.allizom.org/tools/query.html

Query Tool



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Write your query

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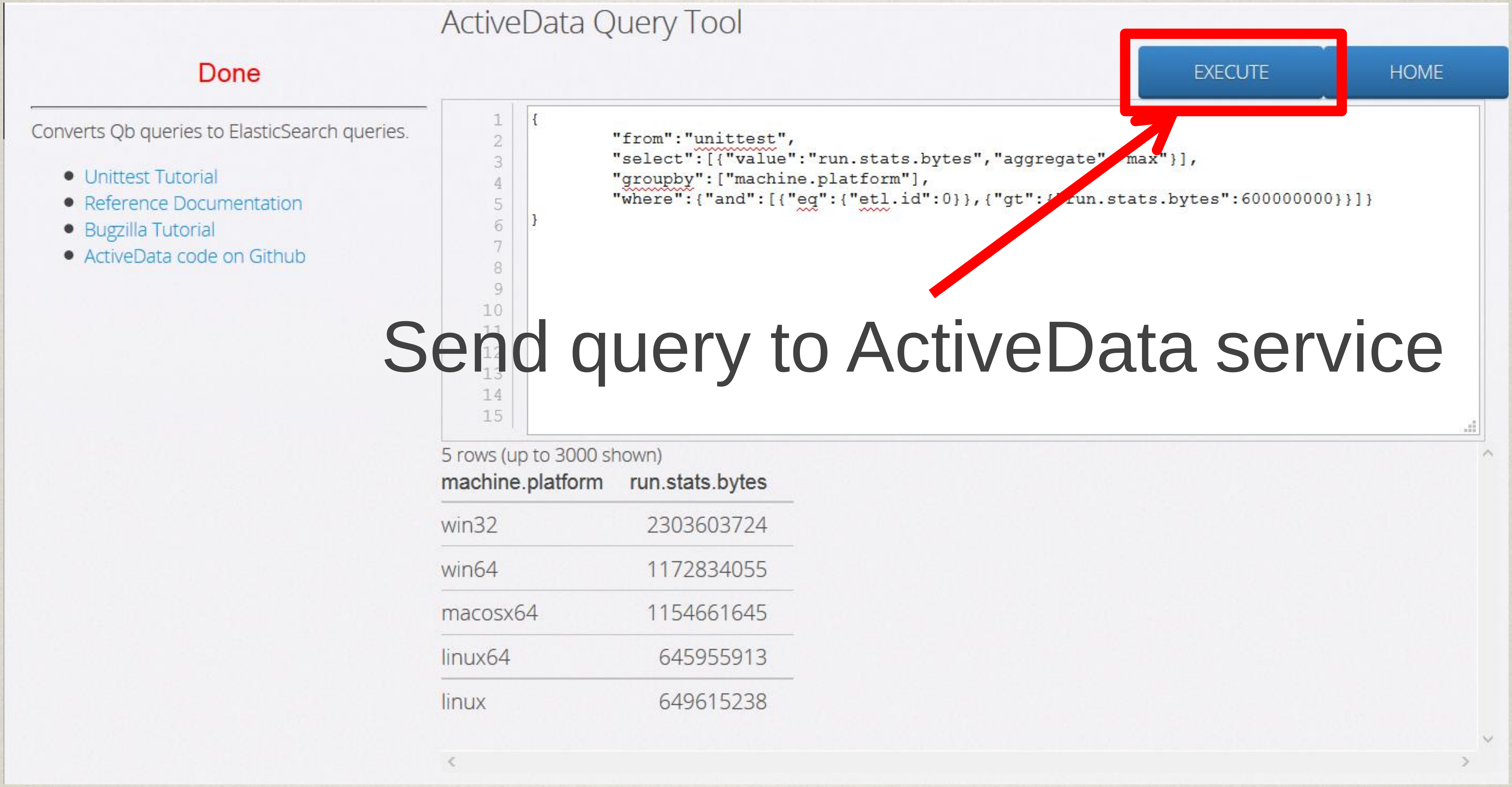
Query Tool



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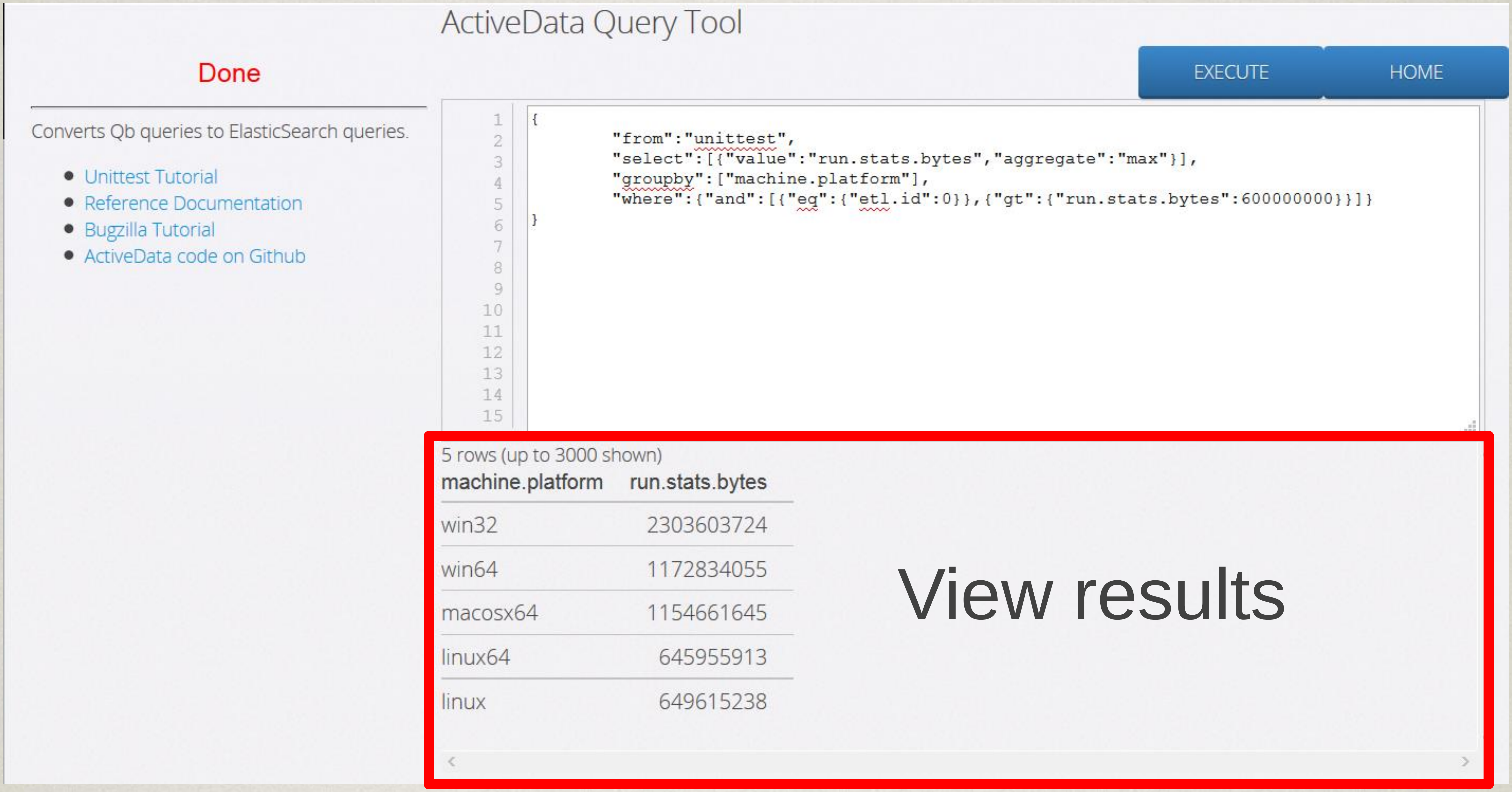
Send query to ActiveData service

http://activedata.allizom.org/tools/query.html

Query Tool



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View results

http://activedata.allizom.org/tools/query.html

Query

Similar to SQL

Qb Query

```
{
"select":{
       "name": "count",
       "value":"run.stats.bytes",
       "aggregate":"max“
},
"from":
       "unittest",
"groupby":[
       "machine.platform“
],
"where":{
       "and":[
              {"eq":{"etl.id":0}},
              {"gt":{"run.stats.bytes":6000}}
       ]
}
}
```

SQL

```
SELECT
       "machine.platform",
       MAX("run.stats.bytes") AS "count",
FROM
       UNITTEST
GROUP BY
        "machine.platform"
WHERE
        "etl.id" = 0 AND
        "run.stats.bytes" > 6000
```

http://activedata.allizom.org/tools/query.html

Response

Extra metadata in response

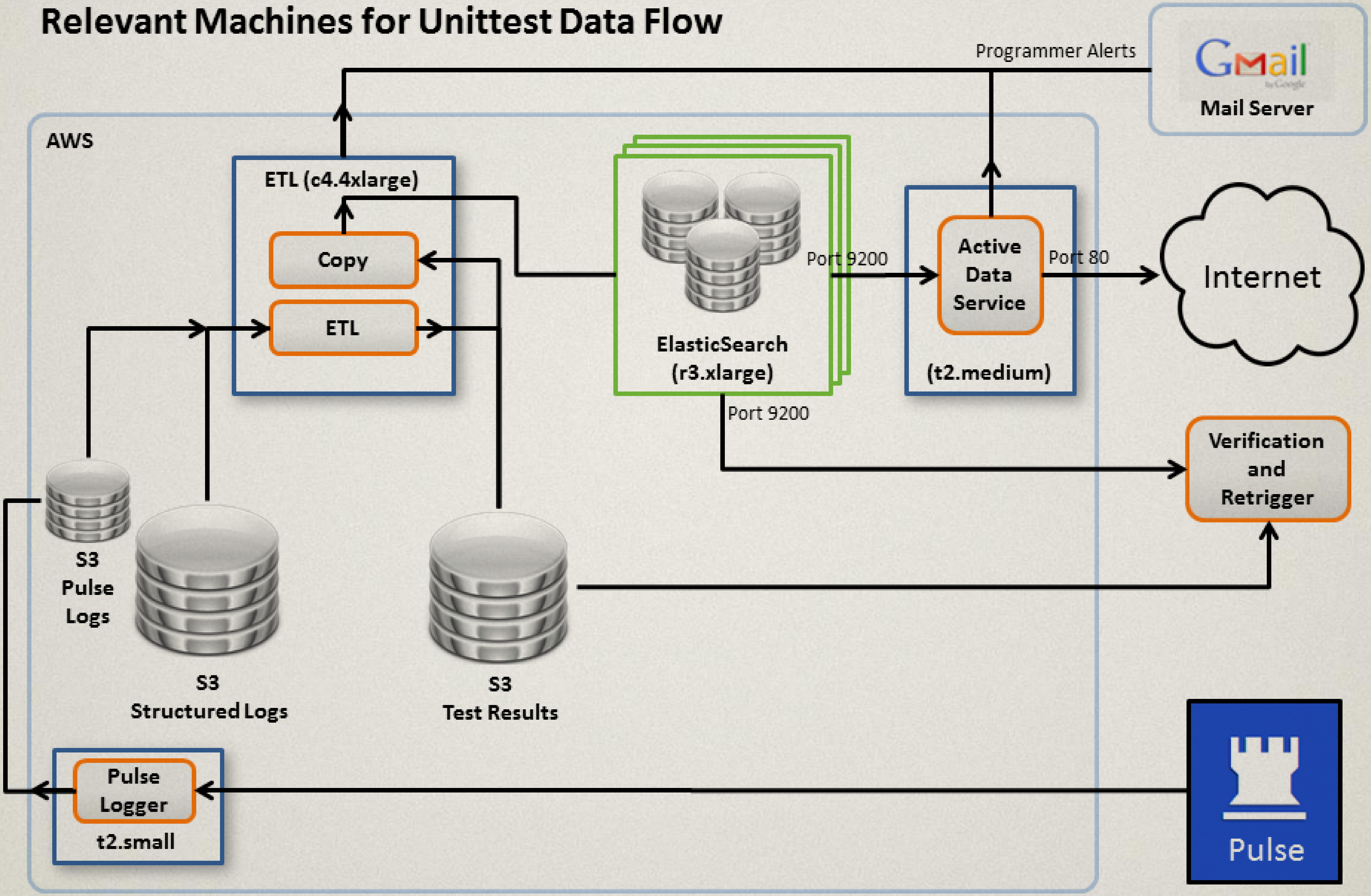
```
{"meta": {
    "active_data_response_time": 1.0833179999999998,
    "es_response_time": 1.0570859999999997,
    "content_type": "application/json",
    "format": "cube“,
    "es_query": {
        "sort": [],
        "query": {
            "filtered": {
                "filter": {"match_all": {}},
                "query": {"match_all": {}}
            }
        },
        "facets": {},
        "from": 0,
        "size": 10
    }
}, "data": ...}
```

Backend

Code at https://github.com/klahnakoski/TestLog-ETL/tree/etl

Architecture

Relevant Machines for Unittest Data Flow

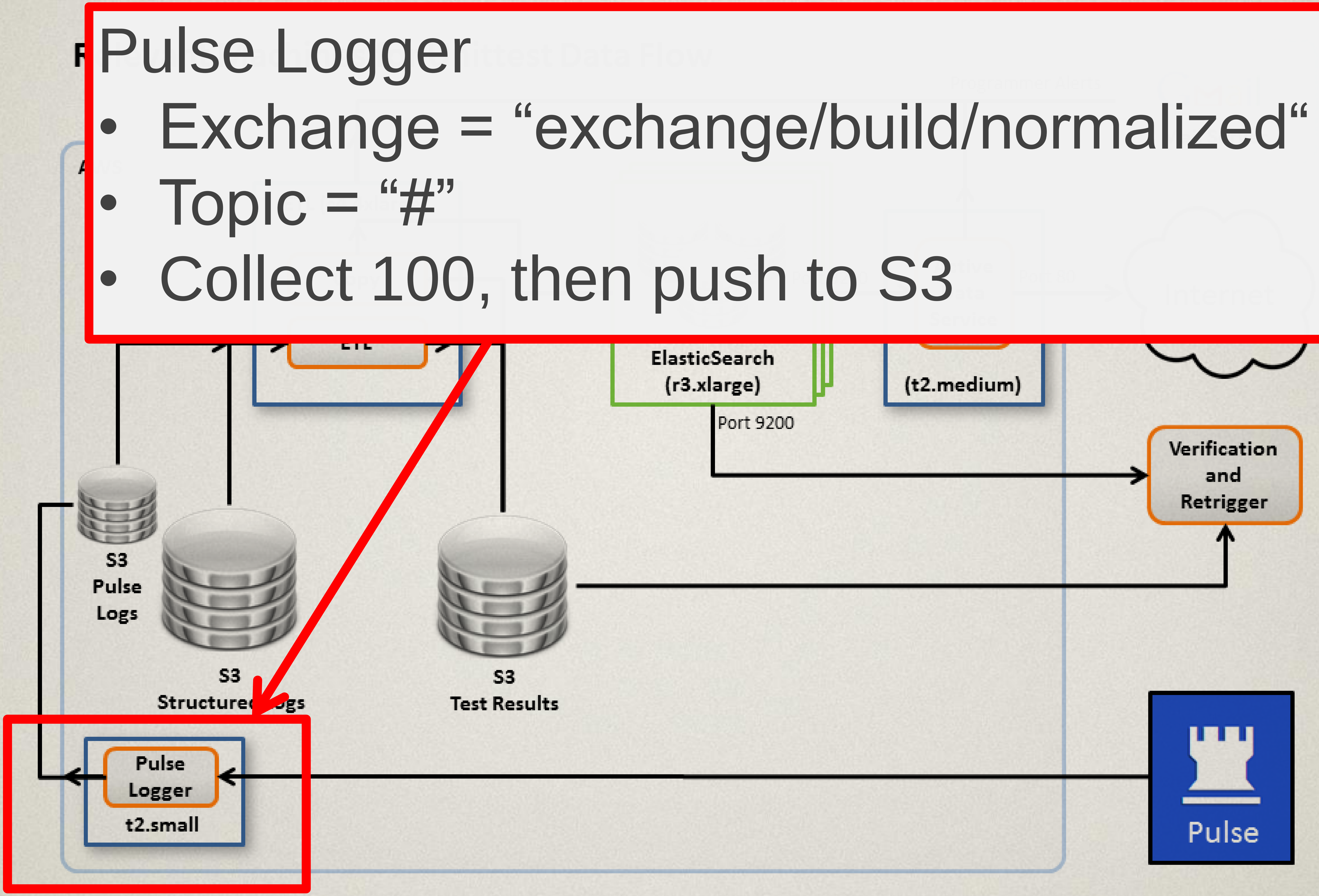


Note: Arrow heads indicate which side initiates connection, and logical direction of data flow.

Architecture

Pulse Logger

- Exchange = “exchange/build/normalized“
- Topic = “#”
- Collect 100, then push to S3



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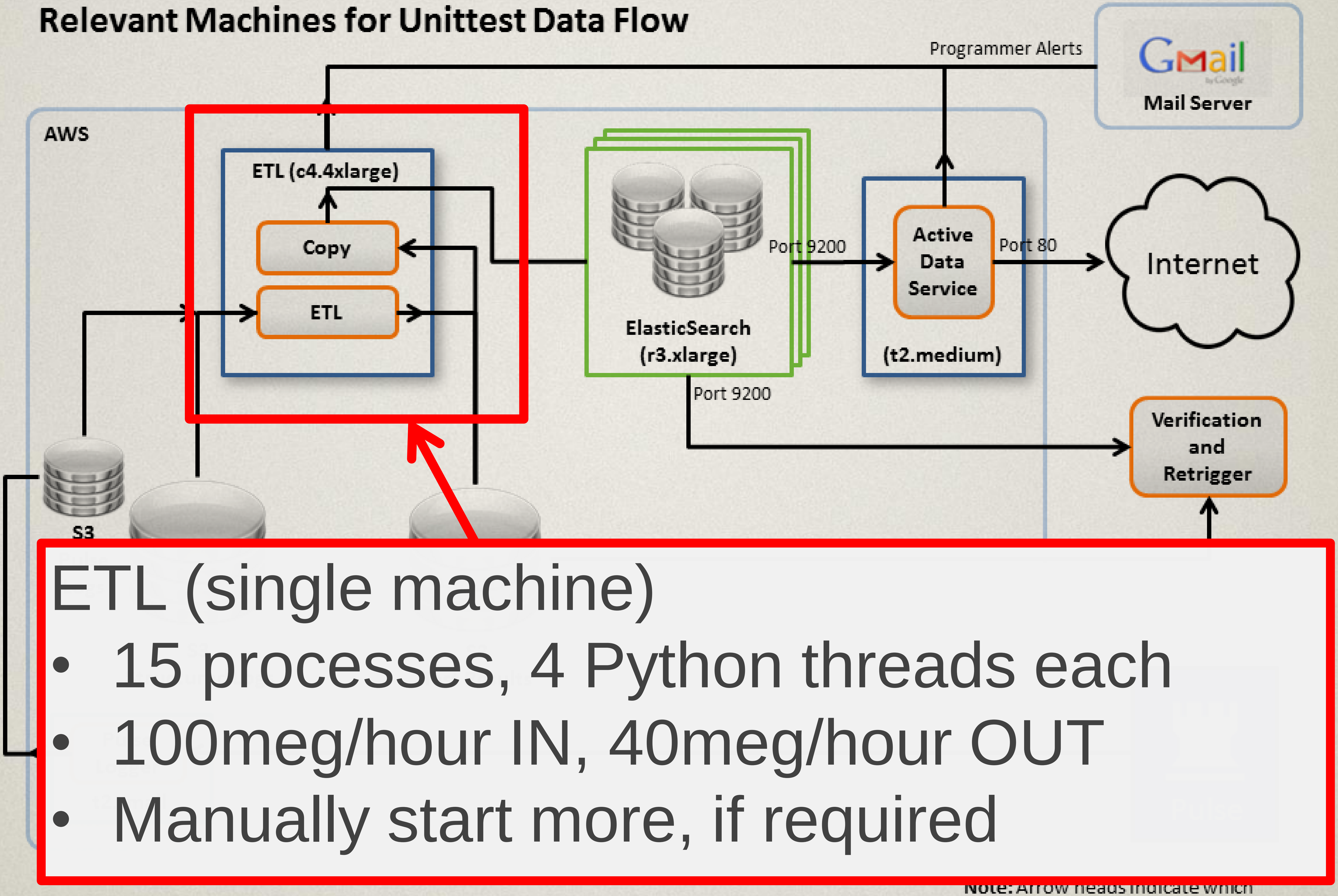
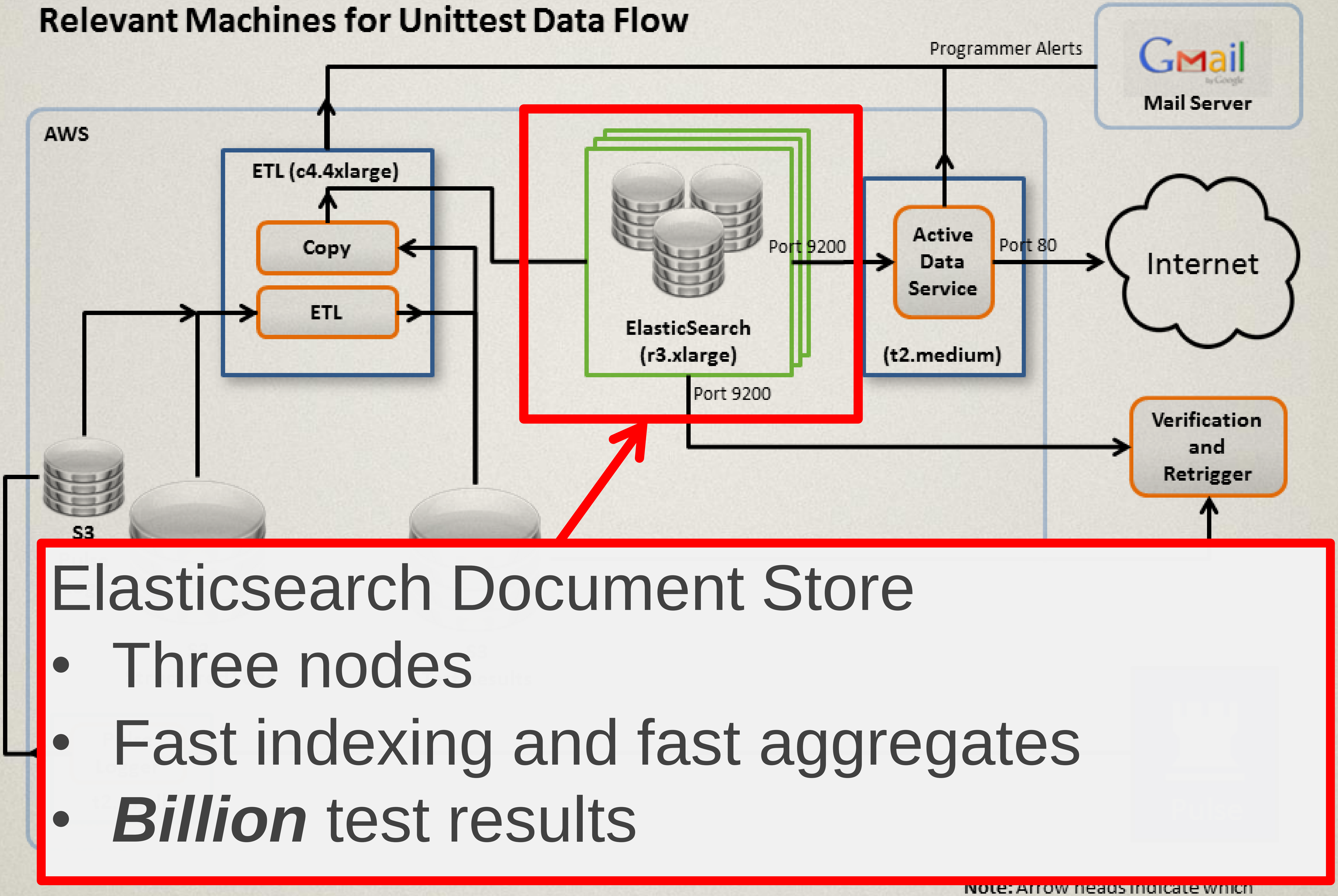


ETL (single machine)

- 15 processes, 4 Python threads each
- 100meg/hour IN, 40meg/hour OUT
- Manually start more, if required

Note: Arrow heads indicate which side initiates connection, and logical direction of data flow.

Architecture

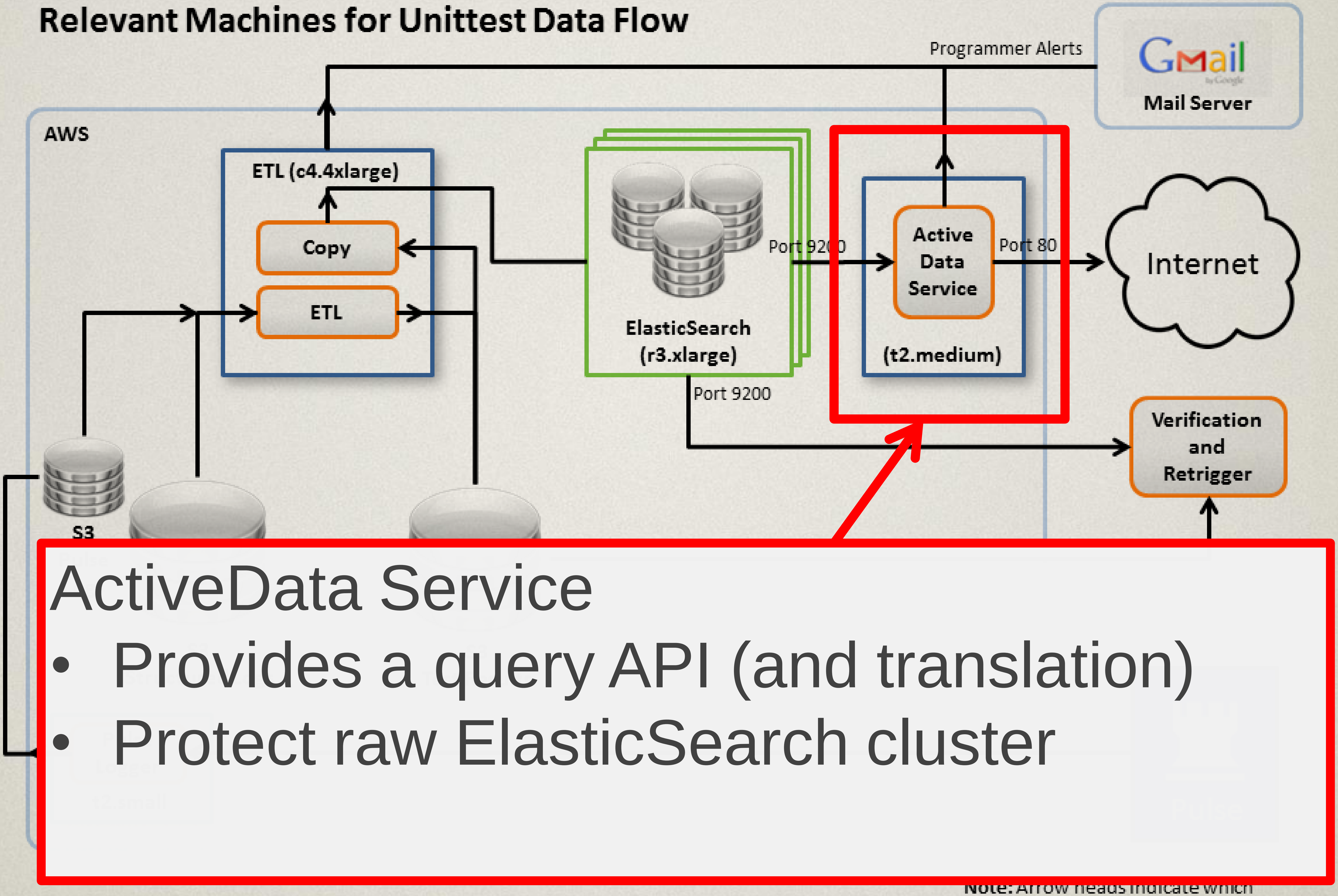


Elasticsearch Document Store

- Three nodes
- Fast indexing and fast aggregates
- ***Billion*** test results

Note: Arrow heads indicate which side initiates connection, and logical direction of data flow.

Architecture



ActiveData Service

- Provides a query API (and translation)
- Protect raw ElasticSearch cluster

Note: Arrow heads indicate which side initiates connection, and logical direction of data flow.

Elasticsearch vs Redshift

ElasticSearch

- Lower cost, use spot instances for even lower price
- 4x faster aggregates? (still investigating)

Redshift

- Easier to deploy
- Better query language (PSQL)
- Good monitoring tools

Summary at https://wiki.mozilla.org/Auto-tools/Projects/ActiveData/Redshift

Current Problems

- Lack of tools to explore data
- No way to see the metadata
- Lack of examples to write queries
- Elasticsearch is starting to show instability with only 3 nodes
- Lots of bugs in ActiveData service
- Bad ETL from past still polluting datastore (and S3)

Future Work

- Real customers to drive improvements
- Increase test cases to cover more queries (currently 63 tests)
- Add Metadata exploration to Query Tool
- Code to leverage spot instances
- More ElasticSearch tuning
- Reduce Costs…

Potential Cost Reduction

- Elasticsearch replicas on spot instances
  - More nodes for better query performance
  - Accept slow service when spot too expensive
  - Single node has no backup, but S3 can

- ETL using spot instances only
  - Currently no need to load ES immediately
  - We can wait hours for a better price
  - Scale if we need to reprocess, or load database

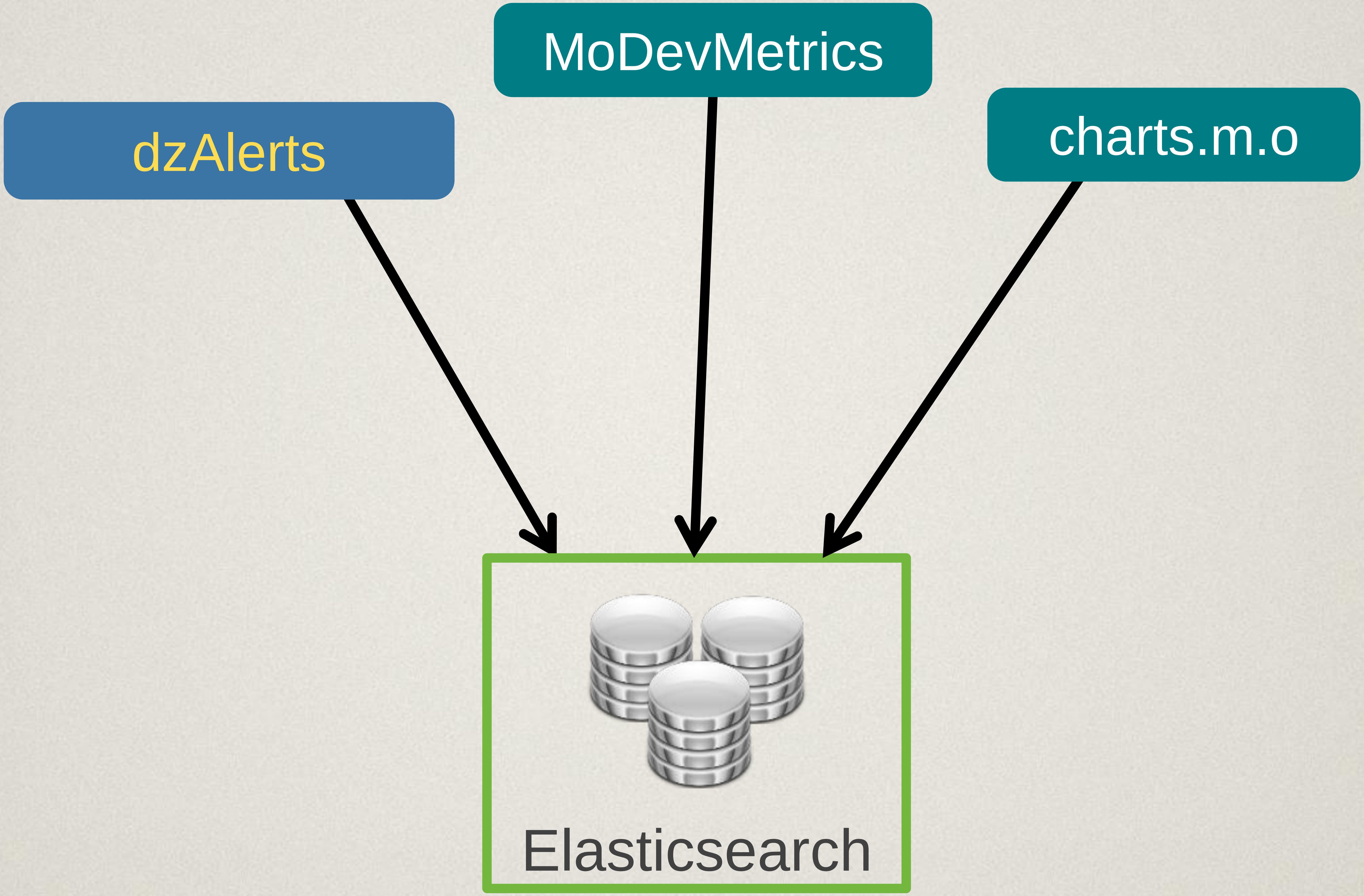
END

Motivation

Not Presented

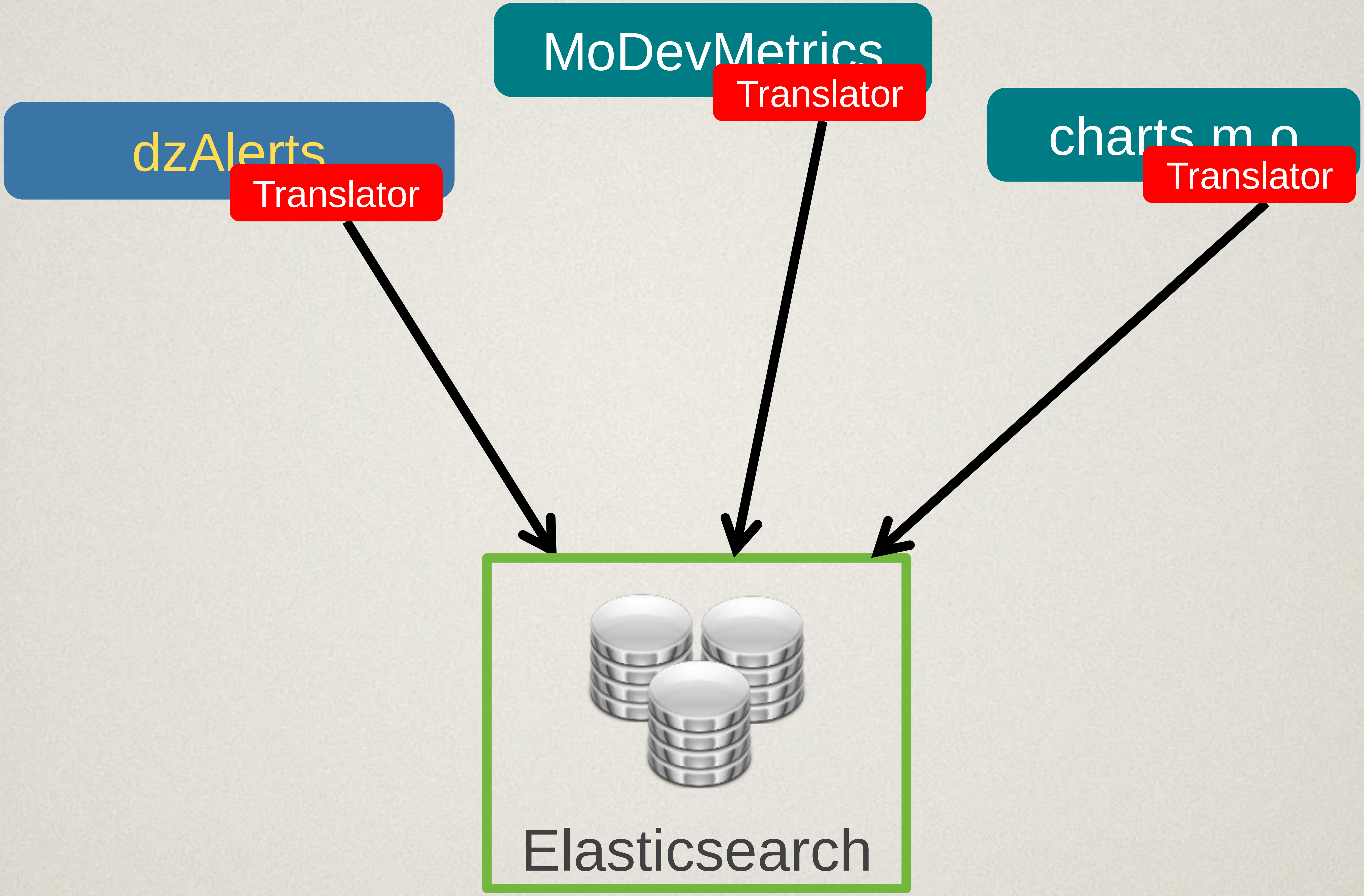
Motivation

Many Clients



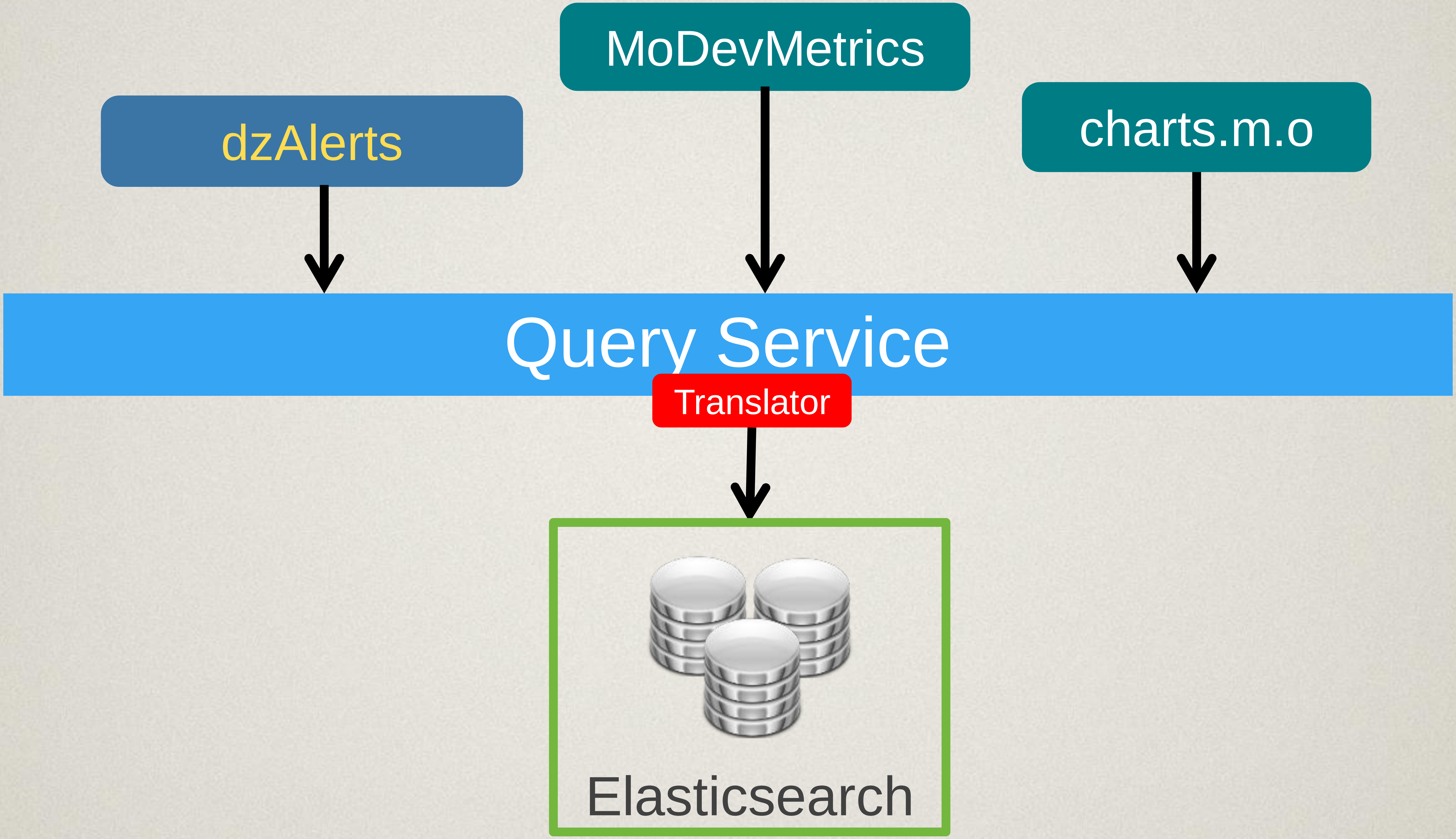
Motivation

Problem: Too Many Translators



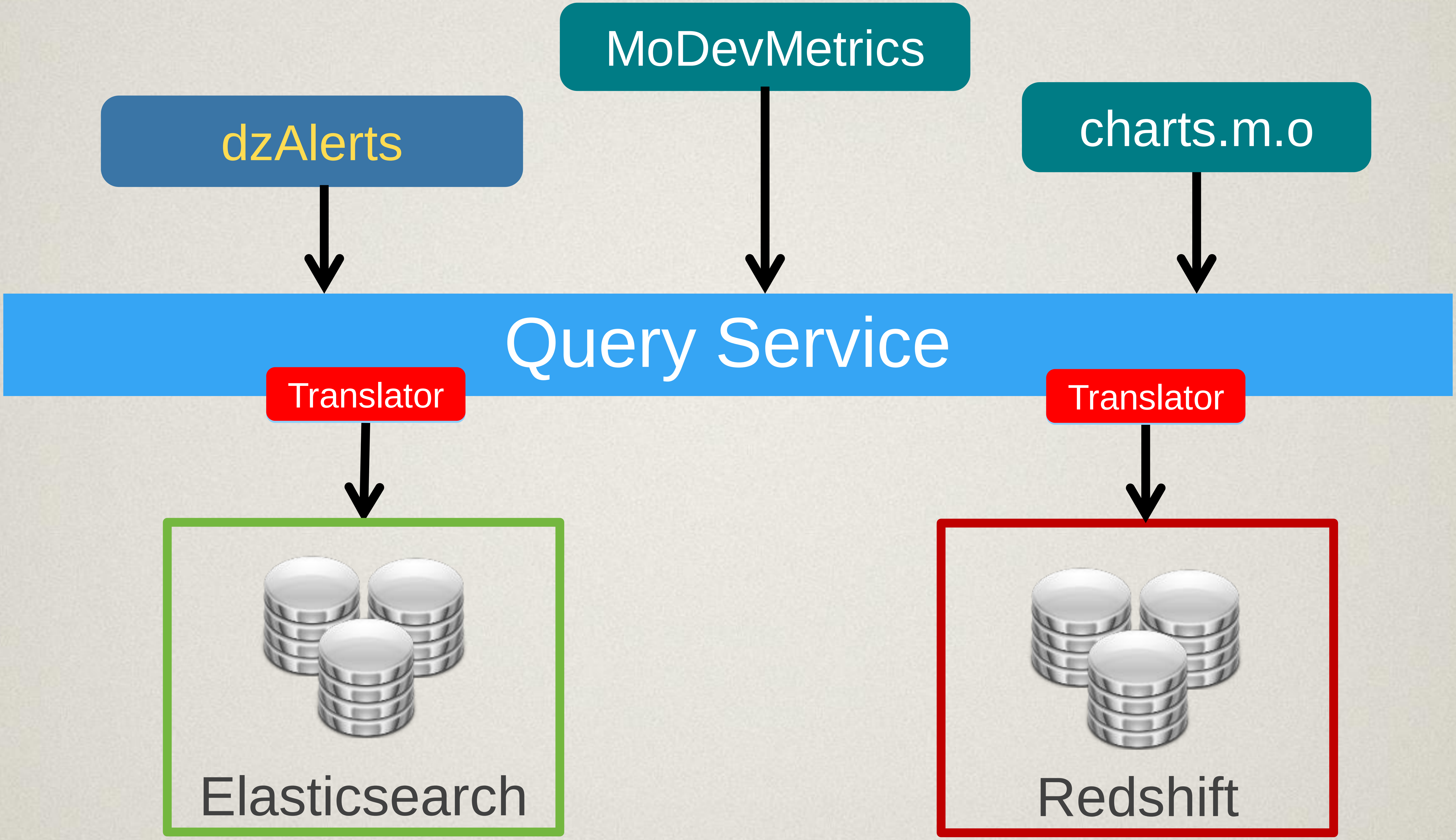
Motivation

Solution: Single Translator



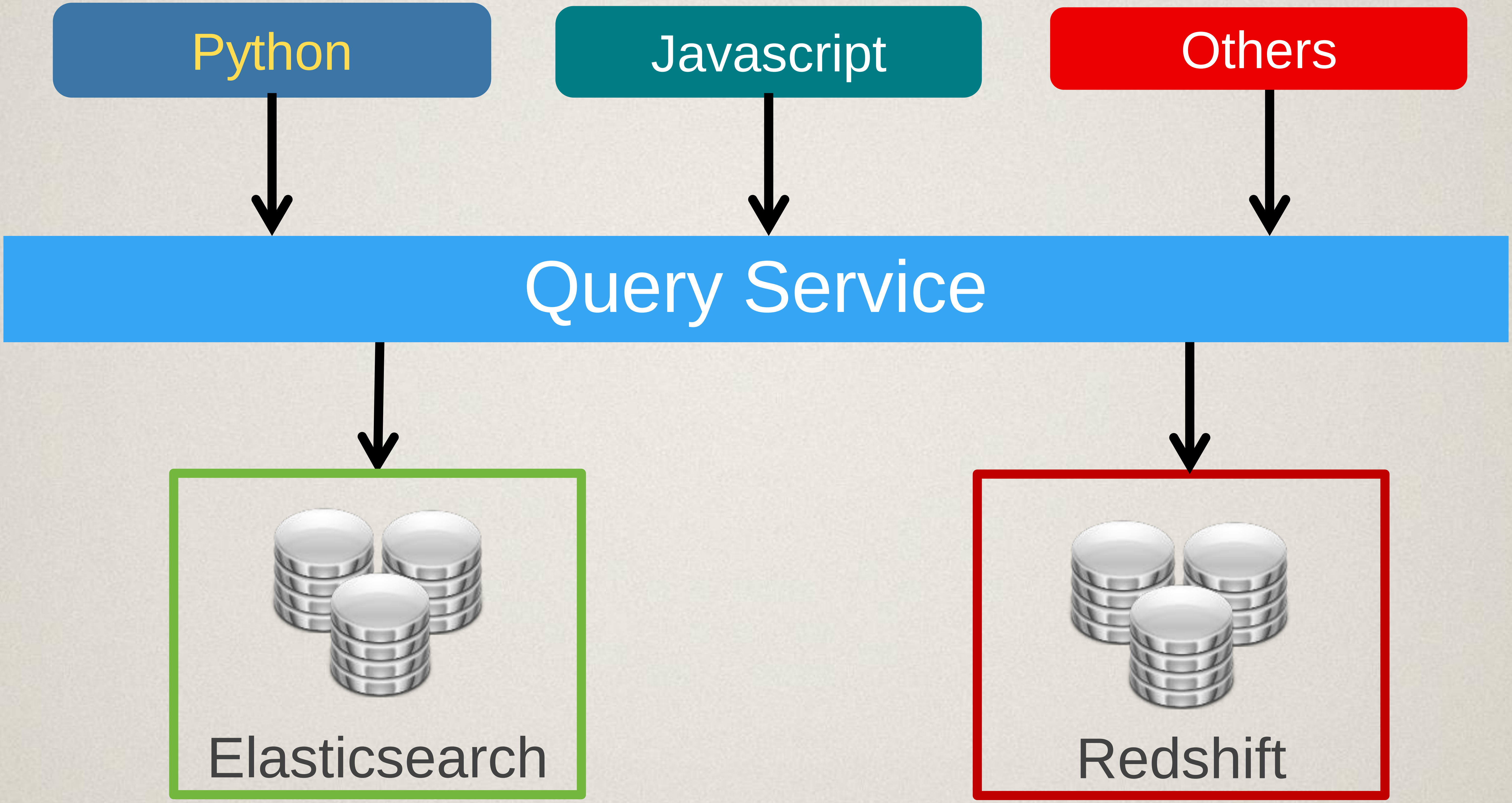
Motivation

Benefit: Multiple Backends



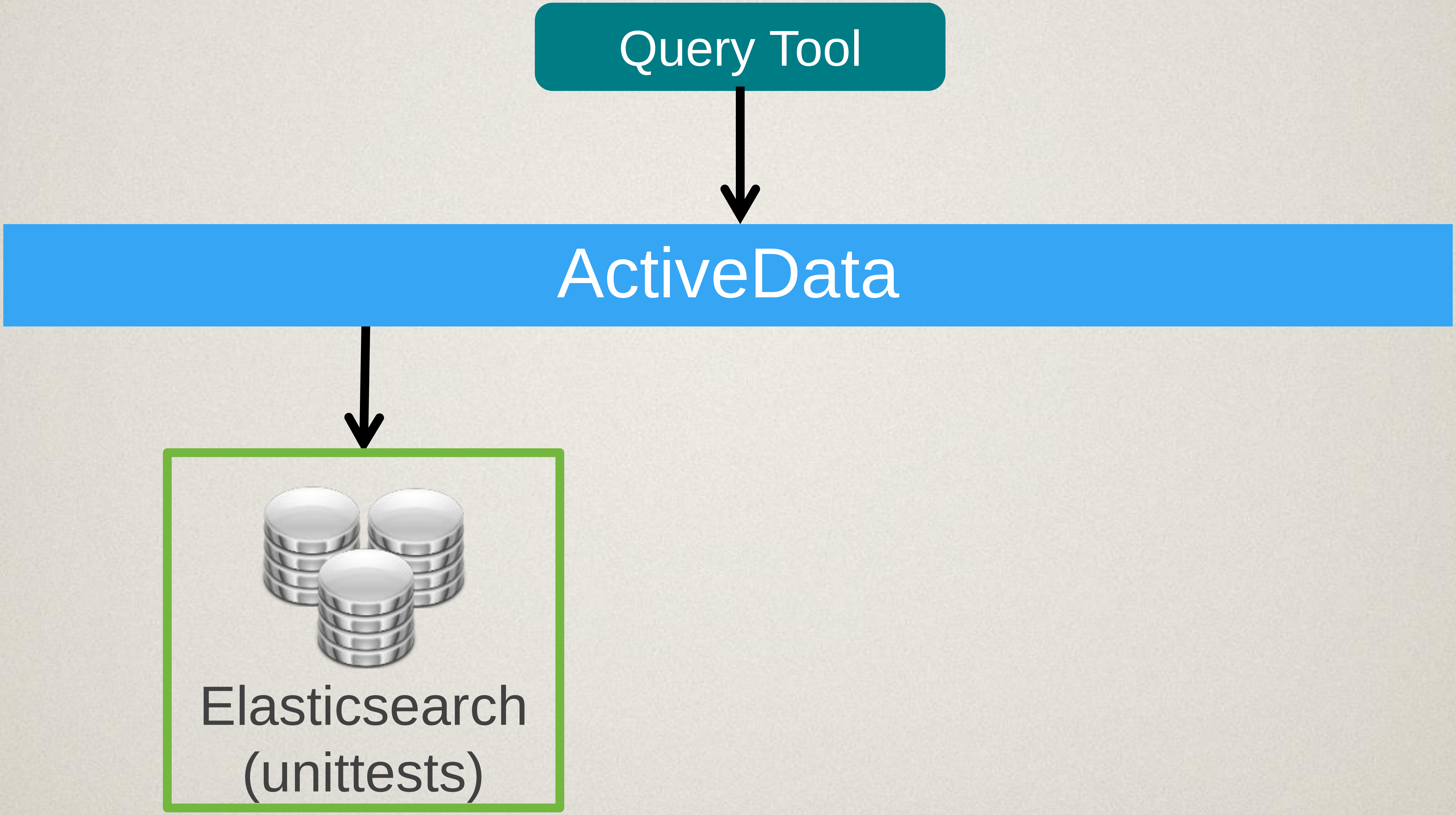
Motivation

Benefit: Diverse Clients



ActiveData API

Start with MVP



Query Tool

ActiveData

Elasticsearch (unittests)