(R)Evolution

Philipp Krenn

@xeraa
Revolution
<table>
<thead>
<tr>
<th>Rank</th>
<th>DBMS</th>
<th>Database Model</th>
<th>Score</th>
<th>Feb 2017</th>
<th>Jan 2018</th>
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Hey guys, I'm using MS Access 2016, and after writing out the SQL Statement to combine all of my tables, I'm getting an error stating "Query is too complex." Is there a work around for this?
Who uses Elasticsearch?
http://thedudeabides.com/articles/the_birth_of_compass
$ curl http://localhost:9200
{
    "name": "elasticsearch1",
    "cluster_name": "docker-cluster",
    "cluster_uuid": "sW2BcTZRRCSVH2sDsWF8A",
    "version": {
        "number": "5.6.7",
        "build_hash": "4669214",
        "build_date": "2018-01-25T21:14:50.776Z",
        "build_snapshot": false,
        "lucene_version": "6.6.1"
    },
    "tagline": "You Know, for Search"
}
$ curl http://localhost:9200
{
    "name": "elasticsearch1",
    "cluster_name": "docker-cluster",
    "cluster_uuid": "sW2BcTZRRCSVVH2sDsWF8A",
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        "build_snapshot": false,
        "lucene_version": "6.6.1"
    },
    "tagline": "You Know, for Search"
}
Apparently, I’m an ELKB personality.
Evolution
Terms

Cluster, Node, Index, Shard, Document
Strictness

5.0

* Demo
IT'S BAD
Parameters & configs
Bootstrap checks
Rolling Upgrades*

6.0

* Demo
Floodstage Watermark

6.0

* Demo
Low 85%

High 90%

Floodstage 95%
Sequence Numbers

6.0

* Demo
63 bits ought to be enough for anyone.
Cross datacenter replication

6.x
Types

5.6 to 8.0

* Demo
Why

Data types

Sparsity

Scoring
How

5.6 opt-in single type

6.x single type

7.x type optional in API

8.x no more types

Automatic Queue Resizing

6.0
Reject and retry instead of long queues

thread_pool.search.target_response_rate: 2s

Serving 50 requests/s

Queue size: 2 * 50 = 100
Adaptive Replica Selection

6.1
C3: Cutting Tail Latency in Cloud Data Stores via Adaptive Replica Selection

Lalith Suresh, Technische Universität Berlin; Marco Canini, Université catholique de Louvain; Stefan Schmid, Technische Universität Berlin and Telekom Innovation Labs; Anja Feldmann, Technische Universität Berlin

https://www.usenix.org/conference/nsdi15/technical-sessions/presentation/suresh
Pick best shard

Exponentially Weighted Moving Average (EWMA)

Piggyback on requests
<table>
<thead>
<tr>
<th>Test case</th>
<th>Throughput improvement %</th>
<th>50th % change</th>
<th>90th % change</th>
<th>99th % change</th>
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<tbody>
<tr>
<td>1 replica, no load</td>
<td>1.9%</td>
<td>-1.7%</td>
<td>0.5%</td>
<td>1.3%</td>
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<tr>
<td>1 replica, with load</td>
<td>115.8%</td>
<td>129.0%</td>
<td>-62.3%</td>
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<td>4 replicas, no load</td>
<td>11.6%</td>
<td>-27.2%</td>
<td>-28.6%</td>
<td>-25.9%</td>
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<td>4 replicas, with load</td>
<td>65.8%</td>
<td>-63.5%</td>
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<td>6.8%</td>
<td>-7.2%</td>
<td>-16.6%</td>
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</tbody>
</table>
Shrink & Split*

5.0       6.1

* Demo
Shrink

Combine shards by a factor
Split

Split into a factor of number_of_routing_shards
Benchmarks
Professor Zapinsky proved that the squid is more intelligent than the housecat when posed with puzzles under similar conditions.
Conclusion
Strictness
Rolling Upgrades
Floodstage Watermark
Sequence Numbers
Types

Automatic Queue Resizing
Adaptive Replica Selection
Shrink & Split
Questions?

Philipp Krenn

@xeraa