

```
Registering the plugin: com.olacabs.bladerunner.monitor.BladeMetricFactory$RoadRunnerPrometheusMetricImpl
Roadrunner metric factory initialized
13:47:38.995 [mainhread] INFO bladerunner.Application: - Step#1/1 Booting Prometheus on port 20010
13:47:39.001 [mainhread] INFO logging.LogServiceHandler: Prometheus metric is started
13:47:39.111 [mainhread] INFO bladerunner.Application: - Step#2/2 Prometheus Service booted- 20010
13:47:39.117 [mainhread] INFO api.GeoSpatialStore: Starting up GeoSpatialStoreImpl
Registering the pull metric: com.olacabs.roadrunner.impl.invertedindex.GeoSpatialStoreImpl
13:47:39.117 [mainhread] INFO api.GeoSpatialStore: GeoSpatialStore Initialized.

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13:47:39.120 [mainhread] INFO invertedindex.RecordActorSystem: Write amplification set at 1
13:47:39.124 [mainhread] INFO bladerunner.Application: Initializing DB service...
13:47:39.161 [mainhread] WARN sources.URLConfigurationSource: No URLs will be polled as dynamic configuration sources.
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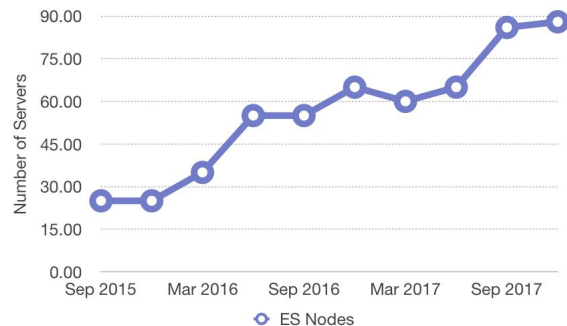
Tracking Service

System which holds real time location and status of OLA supply

Evolving system, first version based on MongoDB, then ElasticSearch

ElasticSearch, open source text search based on Lucene with geospatial support

December 2017 - 4 clusters with 88 nodes in total, limited gains with adding more, 8 app servers **totaling to 96 machines.**

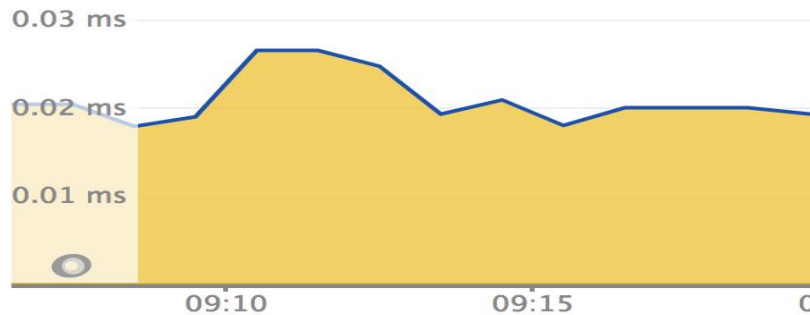


A New Approach

- In memory field level indexes, S2 geometry for geo fields
- Specialized data structure at field level (inverted, columnar, sorted, dict-encoding)
- Lock-free data structure (LSM with pointer switch)
- Mechanical sympathy (Vectorized instructions, L1/L2, SIMD)
- Accuracy-performance tradeoff (data inconsistency for some transient fields (lat,lng), also accuracy (distance .001%))



Update (AVG) Existing System



Update (AVG) New approach

Benefits	Previous System	New System
Servers hosting app and index	96 Machines	14 servers
Indexing delay	1005ms	3ms
Response times (99%)	140ms	80ms
Uptime	99.95	99.999
Stockout	High due to slow indexing	Low
Multi Geo Support	No	Yes

Indexing Mechanism

