CASSANDRA MEASUREMENTS

PROOF OF CONCEPT – EBS IMPLEMENTATION

**April 2016**

**Side-by-Side Comparison**

Test Windows –

Ephemeral:

Start

Finish:

EBS:

Start:

Finish:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| NUMBER | MEASUREMENT | PASSING VALUE | SIGNIFICANCE | EPHEMERAL STORAGE | EBS STORAGE |
| 1 | Pending compactions with steady “read only” load | < 15 at all times | High number of pending compactions has a negative impact on read performance because of I/ O contention between SSTables and compacting them |  |  |
| 2 | Disk utilization with steady “writes only” load | < 40% most of the time. Never higher than 70% | We use writes only because reads tend to get drawn from cache |  |  |
| 3 | Scalability  Steady state work load run against 3, 6 and 9 nodes | Throughput increases, but latency does not. | Although it is widely acknowledged that Cassandra scales in a linear fashion, this test provides concrete proof that the current project follows this pattern |  |  |
| 4 | TPSTATS  Steady state load | No blocked processes or dropped messages | Dropped or blocked processes indicate a bottleneck in hardware or configuration tuning |  |  |
| 5 | Write latency with steady state load | Flat or downward trend | Increasing latency indicates Commit log or Memtable could be overrun with write requests |  |  |
| 6 | CMS collections  (Concurrent Mark Sweep)  Steady state (any work load) | No OldGen activity lasting > 5 min | OldGen garbage collection is expensive. If heap is not released consistently, excessive CMS activity can cause OutOfMemoryExceptions in Casssandra |  |  |
| 7 | Run Queries in cqlsh (shell) with TRACE enabled  Can be run on any node from the cluster | Query trace shows no more than 2 partitions used to get results for Read requests. | Using TRACE mode while executing a CQL query can expose inefficient query patterns and/or table designs |  |  |
| 8 | Row sizes in cfhistogram  Also dual hump latency is indicative of a problem | Graduated column sizes (no one partition/row greatly outsizes the others) | A single partition that is much larger than any others is a sign of problems with client application and/or data model |  |  |
| 9 | Cassandra Anti-Patterns – Static analysis of source code, table schemas and keyspace definition | Review code to verify best usage of the Java driver, CQL3 and Cassandra featurees | AntiPatterns fall into different categories:   * Deployment * Data model * Access Patterns |  |  |
| 10 | Parnew Garbage collection | Should not last more than 1000 ms per 1 sec interval | Execessive ParNew collection indicates overload of the write paths and can lead to unresponsiveness |  |  |

# New Relic

# APM stats

|  |  |  |
| --- | --- | --- |
| CPU | Avg Response | Errors |
| Network (rx/tx) | Throughput | Memory |
|  | JVMGCTime |  |
|  |  |  |

# Gatling

# Global stats

|  |  |  |  |
| --- | --- | --- | --- |
| Mean Response | 95th% Response | Errors | Throughput |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |