7019-Test: Perf Comparison [12/14 STCS - provide_overlapping_tombstones]

Setup

3 nodes cluster.
200+GB of data per node.
Single table.
Schema:
First phase, run steady state with

```
--compaction "{'class': 'SizeTieredCompactionStrategy'}"
--compression "{'sstable_compression': 'LZ4Compressor'}"
```

Second phase, after running for 2 hours, change the compaction to

```
--compaction "{'class': 'SizeTieredCompactionStrategy', 'provide_overlapping_tombstone
```

GC is amortized over each background compaction, since the table sets `provide_overlapping_tombstones` to row.
QPS: 3K/s.
Read : Write : Delete = 5 : 4 : 1

Timings

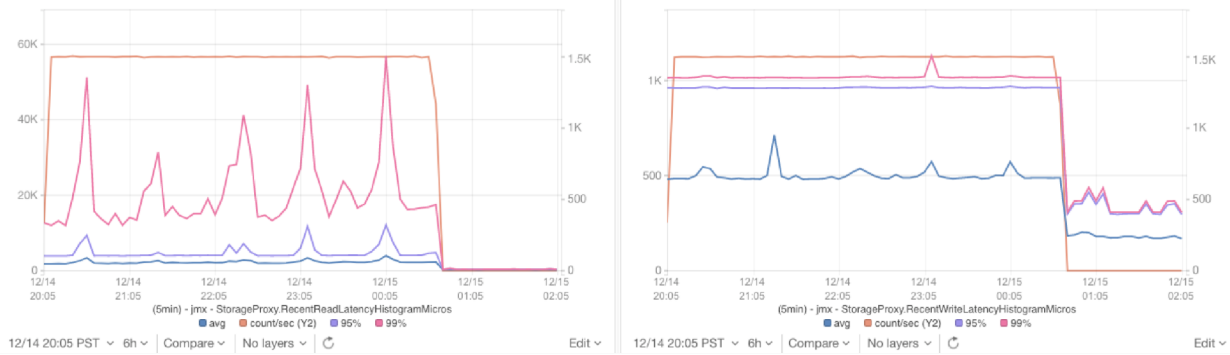
Steady State Start Time: Mon Dec 14 20:01:30 PST 2020
Altering `provide_overlapping_tombstones` Time: Mon Dec 14 22:01:33 PST 2020
Test Stop Time: Mon Dec 15 00:40:30 PST 2020

Result

Metric	Steady State	provide_overlapping_tombstones == row
Read Throughput	1.5k/s	1.5k/s
Read Latency avg.	2.21k micros	2.57k micros
Read Latency p95	4.78k micros	5.61k micros
Read Latency p99	19.76k micros	24.11k micros
Write Throughput	1.5k/s	1.5k/s
Write Latency avg.	510.08 micros	501.86 micros
Write Latency p95	958.9 micros	962.60 micros
Write Latency p99	1.01k micros	1.02k micros

Read & Write Throughput and Latencies

The average read latency goes up ~20% after altering the `provide_overlapping_tombstones` to `row` for the table.
For the write latency, there is no significant change before and after altering the table.
The spikes are related with the compaction load.

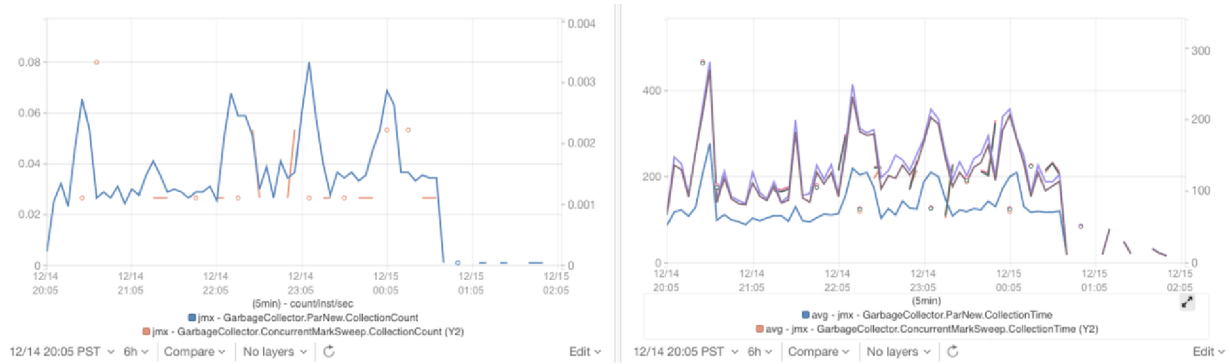


Timeouts

No timeouts are observed from the run.

JVM GC Count & Duration

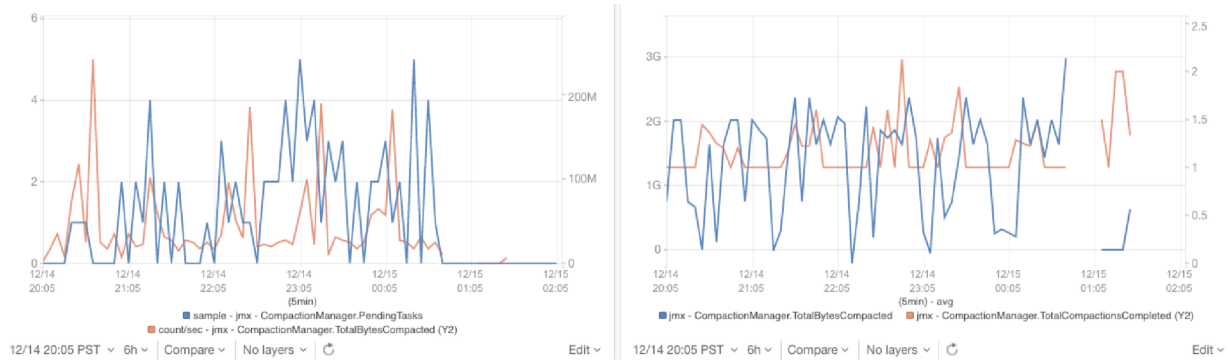
`ParNew` is slightly more frequent in the second phase. GC duration is about the same.



Compaction Rate & Throughput

The number of pending compaction tasks rises slightly after enabling `provide_overlapping_tombstones == row`. The cause should be that each compaction task takes a longer time to complete due to the garbage skipping step introduced in the second phase.

The compaction throughput remains the same.



Live SSTable Count

The number of live SSTables is almost the same before and after altering schema.