Performance Tuning Advise for DSE

Tracing Query Execution from CQLSH Session:

```
cassandra@cqlsh> tracing on
```

Run any query to get the execution trace:

```
SHOW SESSION <session id>;
```

Memtable & Flushing (cassandra.yaml)

- memtable_space_in_mb: 2048 MB default (1/4 heap); increase for write-heavy (up to 1/3 heap).
- memtable_flush_writers: 8 per disk; scale with cores/disks.
- memtable_cleanup_threshold: 0.15 default; lower (0.11) for frequent flushes.

Caching (cassandra.yaml)

- row_cache_size_in_mb: 0 (disabled); enable for static data (5-10% heap).
- key_cache_size_in_mb: 5% heap default; increase for read-heavy.
- counter_cache_size_in_mb: Auto (2.5% heap); tune for counters.
- Best Practice: Set row_cache_keys_to_save: ALL; invalidate on schema changes.

Reads/Writes Tuning (cassandra.yaml)

- concurrent_reads: 32 default; set to 2x cores for latency-sensitive.
- concurrent_writes: 32 default; match write throughput.
- commitlog_sync: periodic (10s default); use batch for durability.
- commitlog_segment_size_in_mb: 32 MB; increase to 64+ for high writes.
- Best Practice: Limit max_mutation_size_in_kb to 256 KB; tune trickle_fsync false for SSDs.

Disk I/O & Commit Log

- disk_optimization_strategy: ssd default. Spinning for magnetic disk
- io_global_queue_depth: 128; increase for high concurrency. Change only bythe advice of DSE support
- Commitlog: Compress (lz4); set commitlog_total_space_in_mb to 25% disk.
- Best Practice: Monitor I/O with iostat; separate dirs for parallelism.

Heap Size

- JVM calculate the heap size as follows:
    - Half of RAM if 50% of RAM is greater than 1GB
    - Quarter of RAM if 50% RAM is less than 1GB