



Managing and troubleshooting ES memory

→ ES runs on JVM & needs some heap memory.

$$\text{Heap Memory} = \text{RAM}/2$$

→ Performance issue happens because of

(a) Configuration :-

(i) No ILM

(ii) Or sharding

(b) Volume of data : High read/writes & searches.

∴ OVER SHARDING :

→ Shard size should be 50GB.

Equal :-

$$\text{Shards} \leq \text{sum}(\text{nodes} \cdot \text{max_heap}) * 20$$

Ex:- 8GB RAM & 2 nodes

$$\text{max heap} - \text{RAM}/2 \rightarrow 4\text{GB}$$

$$\text{sum}(\text{nodes} \cdot \text{max_heap}) \rightarrow 4\text{GB} \times 2 \text{nodes} = 8\text{GB}$$

$$\begin{aligned}\text{max_shards} &= 8 \times 20 \\ &= 160 \text{ shards}\end{aligned}$$

- Once done, check cluster allocation using "-cat/allocations" or "-cluster/health".
 - ↓
 - GET /_cluster/health/?filter_path=status,_shards
- If any value except primary, replica > 0 means missing config or unassigned shards > 0
 - ↓
 - This will make cluster RED
- Then, we need to check "-cat/shards". If any unassigned shards are present, we need to check why using "-cluster/allocate/explain".
- To manually fix, use "POST /_cluster/relocate".

CIRCUIT BREAKERS

- Maxing heap allocation on cluster causes "Circuit Breaking exceptions".
 - ↓
 - "elasticsearch log".
- To investigate, check
 - ① "-cat/nodes".We need to check for
 - (a) High Bucket Aggregations

(b) non-optimized mappings

(c) Batch & async queries

② Check "JVM Memory Pressure" using "-nodes/stats"

$$\text{JVM Pressure} = \frac{\text{used_in_bytes}}{\text{max_in_bytes}}$$