



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) Oversharding

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

OVERSHARDING:

→ Shard size should be 50GB.
Equation:-

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

Ex:- 8GB RAM & 2 nodes

$$\text{max_heap} = \text{RAM} / 2 \rightarrow 4\text{GB}$$

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

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

→ Once done, check cluster allocation using "-cat/allocation"
or "-cluster/health".

Get /_cluster/allocation

GET /_cluster/health/?filter_path=status,*_shards

→ If any value except primary, replica > 0 means Missing config
ex: 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/allocation/explain".

→ To manually fix, use "POST /_cluster/route".

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"

$$\text{JVM Pressure} = \frac{\text{used-in-bytes}}{\text{max-in-bytes}}$$