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Cassandra Installation and Configuration Guide

Performance Tuning

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Performance Tuning

Besides configuring keyspaces and column families, it is possible to further tweak the performance of Cassandra by editing `cassandra.yaml` (Node and Cluster Configuration) or by editing `cassandra-env.sh` (JVM Configuration).

Descriptions of tunable properties can be found in both `cassandra.yaml` and `cassandra-env.sh`. A summary of these properties can be seen in the tables below:

Performance Tuning Properties (cassandra.yaml)

Option	Default	Description
column_index_size_in_kb	64	The size at which column indexes are added to a row. Value should be kept small if only a select few columns are consistently read from each row as a higher value implies that more row data must be deserialized for each read (until index is added).
commitlog_sync	periodic	Allowed values are `periodic` or `batch`. In `periodic` mode, the value of `commitlog_sync_period_in_ms` determines how frequently the commitlog is synchronized to disk. Writes are acknowledged at every periodic sync. If set to batch, writes are not acknowledged until fsynced to disk.
commitlog_sync_period_in_ms	10000 (10 seconds)	Determines how often (in milliseconds) to sync commitlog to disk when `commitlog_sync` is set to `periodic`.
commitlog_total_space_in_mb	4096	When commitlog reaches specified size, Cassandra flushes memtables to disk for oldest `commitlog` segments. Reduces amount of data to replay on startup.
compaction_throughput_mb_per_sec	16	Throttles compaction to the given total throughput across entire system. Value should be proportional to rate of write throughput (16 to 32 times). Setting to 0 disables compaction throttling.
concurrent_compactors	1 (per CPU core)	Max number of concurrent compaction processes allowed on a node.

Option	Default	Description
concurrent_reads	16	Recommended setting is 16 * number_of_drives. This allows enough operations to queue such that the OS and drives can reorder them and minimize disk fetches.
concurrent_writes	32	Number of concurrent writes should be proportional to number of CPU cores in system. Recommended setting is (8 * number_of_cpu_cores).
memtable_flush_writers	1 per data directory	Number of memtable flush writer threads. Influences flush performance and can be increased if you have a large Java heap size and many data directories.
memtable_heap_space_in_mb	1/4 of heap	Total memory used for all column family memtables on a node.
stream_throughput_outbound_megabits_per_sec	400	Max outbound throughput on a node for streaming file transfers.

JVM Configuration Settings

Linux: conf/cassandra-env.sh
Windows: bin\cassandra.bat

Option	Default	Description
MAX_HEAP_SIZE	Half of available physical memory	Maximum heap size for the JVM. Same value is used for minimum heap size, allowing heap to be locked in memory. Should be set in conjunction with HEAP_NEWSIZE.
HEAP_NEWSIZE	100 MB per physical CPU core	Size of young generation. Larger value leads to longer GC pause times while smaller value will typically lead to more expensive GC. Set in conjunction with MAX_HEAP_SIZE.
com.sun.management.jmxremote.port	7199	Port on which Cassandra listens for JMX connections.

Option	Default	Description
com.sun.management.jmxremote.ssl	false	Enable/disable SSL for JMX.
com.sun.management.jmxremote.authenticate	false	Enable/disable remote authentication for JMX.