Cloud SQL　(https://cloud.google.com/sql/)
Documentation　(https://cloud.google.com/sql/docs/)
MySQL　(https://cloud.google.com/sql/docs/mysql/) Guides

Configuring database flags

MySQL | PostgreSQL (https://cloud.google.com/sql/docs/postgres/flags) | SQL Server (https://cloud.google.com/sql/docs/sqlserver/flags)

This page describes how to configure database flags for Cloud SQL, and lists which flags you can set for your instance. You use database flags to adjust MySQL parameters and options, to configure and tune your instance.

Note: some database flag settings can affect instance availability or stability, and remove the instance from the Cloud SQL SLA (https://cloud.google.com/sql/sla). For information about these flags, see Operational Guidelines (https://cloud.google.com/sql/docs/mysql/operational-guidelines).

In some cases, setting one flag may require that you set another flag to fully enable the desired functionality. For example, to enable slow query logging (https://dev.mysql.com/doc/refman/5.7/en/slow-query-log.html), you must set both the `slow_query_log` flag to `on` and the `log_output` flag to `FILE` to make your logs available using the Google Cloud Console Logs Viewer.

When you set, remove, or modify a flag for an instance, the instance might be restarted. The flag value is then persisted for the instance until you remove it. If the instance is the source of a replica, the replica will also restart to align with the current configuration of the instance.

Configuring database flags

Setting a database flag

CONSOLE	GCLOUD	CURL

1. In the Google Cloud Console (https://console.cloud.google.com/project/_/sql/instances), create a new Cloud Console project, or open an existing project by selecting the project name.

> ★ **Important:** You should be aware that some resource identifiers (such as project IDs) might be retained beyond the life of your project. For this reason, avoid storing sensitive information in resource identifiers.

...see naming guidelines

2. Open the instance and click **Edit**.

3. Scroll down to the **Flags** section.

4. To set a flag that has not been set on the instance before, click **Add item**, choose the flag from the drop-down menu, and set its value.

5. Click **Save** to save your changes.

6. Confirm your changes under **Flags** on the Overview page.

Clearing all flags to their default value

CONSOLE　　　　GCLOUD　　　　CURL

1. In the Google Cloud Console (https://console.cloud.google.com/project/_/sql/instances), create a new Cloud Console project, or open an existing project by selecting the project name.

> ★ **Important:** You should be aware that some resource identifiers (such as project IDs) might be retained beyond the life of your project. For this reason, avoid storing sensitive information in resource identifiers.

...see naming guidelines

2. Open the instance and click **Edit**.

3. Open the **Database flags** section.

4. Click the **X** next to all of the flags shown.

5. Click **Save** to save your changes.

Viewing current values of database flags

To view all current values of the MySQL system variables, log into your instance with the `mysql` client and enter the following statement:

```
SHOW VARIABLES;
```

Note that you can change the value only for supported flags (as listed below).

Determining what database flags have been set for an instance

To see what flags have been set for a Cloud SQL instance:

CONSOLE	GCLOUD	CURL

1. In the Google Cloud Console (https://console.cloud.google.com/project/_/sql/instances), create a new Cloud Console project, or open an existing project by selecting the project name.

★ **Important:** You should be aware that some resource identifiers (such as project IDs) might be retained beyond the life of your project. For this reason, avoid storing sensitive information in resource identifiers.

   ...see naming guidelines

2. Select the instance to open its **Instance Overview** page.

   The database flags that have been set are listed under the **Database flags** section.

Supported flags

The flags supported in Cloud SQL are the most commonly requested flags for MySQL.

For a given flag, Cloud SQL might support a different range than the corresponding MySQL parameter or option.

Note: Some flags in the following table are in beta for Cloud SQL. Acceptable ranges for these flags might change. The Cloud SQL SLA (https://cloud.google.com/sql/sla) does not cover instances that use non-default settings for these flags.

The flags apply to all versions of MySQL supported by Cloud SQL except where noted.

A (#mysql-a) | B (#mysql-b) | C (#mysql-c) | D (#mysql-d) | E (#mysql-e) | F (#mysql-f) | G (#mysql-g) | I
(#mysql-i) | L (#mysql-l) | M (#mysql-m) | N (#mysql-n) | O (#mysql-o) | P (#mysql-p) | Q (#mysql-q) | R
(#mysql-r) | S (#mysql-s) | T (#mysql-t) | U (#mysql-u) | W (#mysql-w)

Cloud SQL Flag	Type Acceptable Values a
auto_increment_increment (https://dev.mysql.com/doc/refman/5.7/en/replication-options-master.html#sysvar_auto_increment_increment)	`integer` `1 … 65535`
auto_increment_offset (https://dev.mysql.com/doc/refman/5.7/en/replication-options-master.html#sysvar_auto_increment_offset)	`integer` `1 … 65535`
binlog_cache_size (https://dev.mysql.com/doc/refman/5.7/en/replication-options-binary-log.html#sysvar_binlog_cache_size)	`integer` `4096 … 922337203685`
binlog_row_image (https://dev.mysql.com/doc/refman/5.7/en/replication-options-binary-log.html#sysvar_binlog_row_image)	`enumeration` `full` (default), `minima`
binlog_stmt_cache_size (https://dev.mysql.com/doc/refman/5.7/en/replication-options-binary-log.html#sysvar_binlog_stmt_cache_size)	`4096 … 922337203685`
character_set_server (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_character_set_server)	`string` utf8 (https://dev.mysql.com unicode-utf8.html) or utf8mb4 (https://dev.mysql.com unicode-utf8mb4.html) (recommended)
default_time_zone (https://dev.mysql.com/doc/refman/5.7/en/server-options.html#option_mysqld_default-time-zone)	`string` Specify values as from zeros required.
eq_range_index_dive_limit (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_eq_range_index_dive_limit)	`integer` `0 … 2147483647`
event_scheduler	`boolean` `on`|`off`

(https://dev.mysql.com/doc/refman/5.7/en/server-system-
variables.html#sysvar_event_scheduler)

Cannot be set at instan
Generation instances.

★ **Note:** Second Generatio
support for First Genera
30, 2020. To upgrade a
Second Generation, see
Instance to Second Ger

If you are using the Eve
configure your instance
(https://cloud.google.c
instance#activation_pc
of ALWAYS to ensure th

explicit_defaults_for_timestamp (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_explicit_defaults_for_timestamp)	`boolean` `on`|`off`
ft_max_word_len (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_ft_max_word_len)	`integer` `10 … 252`
ft_min_word_len (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_ft_min_word_len)	`integer` `1 … 16`
ft_query_expansion_limit (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_ft_query_expansion_limit)	`integer` `0 … 1000`

general_log
 (https://dev.mysql.com/doc/refman/5.7/en/server-system-
variables.html#sysvar_general_log)
	`boolean`
	`on`|`off`
	
	See the Tips
	 (https://cloud.google.c
	general-log)
	section for more inform

group_concat_max_len (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_group_concat_max_len)	`integer` `4 … 17179869184`
init_connect (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_init_connect)	`string`

innodb_adaptive_hash_index (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_adaptive_hash_index)	boolean on|off
innodb_adaptive_hash_index_parts (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_adaptive_hash_index_parts)	integer 1 … 512
innodb_adaptive_max_sleep_delay (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_adaptive_max_sleep_delay)	integer 0 … 1000000
innodb_autoinc_lock_mode (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_autoinc_lock_mode)	integer 0 … 2
innodb_change_buffer_max_size (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_change_buffer_max_size)	integer 0 … 50
innodb_concurrency_tickets (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_concurrency_tickets)	integer 1 … 4294967295
innodb_file_per_table (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_file_per_table)	boolean on|off See the Tips (https://cloud.google.c file-per-table) section for more inform
innodb_fill_factor (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_fill_factor)	integer 10 … 100
innodb_ft_aux_table (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_aux_table)	string
innodb_ft_cache_size (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_cache_size)	integer 1600000 … 80000000
innodb_ft_enable_diag_print (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_enable_diag_print)	boolean on|off

innodb_ft_enable_stopword (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_enable_stopword)	`boolean` `on|off`
innodb_ft_max_token_size (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_max_token_size)	`integer` `10 ... 252` Supported only in MySC
innodb_ft_min_token_size (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_min_token_size)	`integer` `0 ... 16` Supported only in MySC
innodb_ft_num_word_optimize (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_num_word_optimize)	`integer` `1000 ... 10000`
innodb_ft_result_cache_limit (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_result_cache_limit)	`integer` `1000000 ... 429496729`
innodb_ft_server_stopword_table (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_server_stopword_table)	`string` Supported only in MySC
innodb_ft_sort_pll_degree (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_sort_pll_degree)	`integer` `1 ... 32`
innodb_ft_total_cache_size (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_total_cache_size)	`integer` `32000000 ... 16000000`
innodb_ft_user_stopword_table (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_ft_user_stopword_table)	`string`
innodb_large_prefix (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_large_prefix)	`boolean` `on|off` Supported only in MySC
innodb_lock_wait_timeout (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_lock_wait_timeout)	`integer` `1 ... 1073741824`

innodb_log_buffer_size (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_log_buffer_size)	integer 262144 ... 4294967295
innodb_log_file_size (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_log_file_size)	integer MySQL 5.6: 1048576 ... MySQL 5.7: 4194304 ...
innodb_lru_scan_depth (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_lru_scan_depth)	integer 100 ... 9223372036854
innodb_old_blocks_pct (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_old_blocks_pct)	integer 5 ... 95
innodb_old_blocks_time (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_old_blocks_time)	integer 0 ... 4294967295
innodb_online_alter_log_max_size (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_online_alter_log_max_size)	integer 65536 ... 92233720368
innodb_optimize_fulltext_only (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_optimize_fulltext_only)	boolean on|off
innodb_print_all_deadlocks (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_print_all_deadlocks)	boolean on|off
innodb_random_read_ahead (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_random_read_ahead)	boolean on|off
innodb_read_ahead_threshold (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_read_ahead_threshold)	integer 0 ... 64
innodb_read_io_threads (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_read_io_threads)	integer 1 ... 64
innodb_replication_delay (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_replication_delay)	integer 0 ... 4294967295

innodb_rollback_on_timeout (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_rollback_on_timeout)	`boolean` `on|off`
innodb_rollback_segments (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_rollback_segments)	`integer` `1 ... 128`
innodb_sort_buffer_size (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_sort_buffer_size)	`integer` `65536 ... 67108864`
innodb_stats_auto_recalc (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_stats_auto_recalc)	`boolean` `on|off`
innodb_stats_method (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_stats_method)	`enumeration` `nulls_equal|nulls_`
innodb_stats_on_metadata (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_stats_on_metadata)	`boolean` `on|off`
innodb_stats_persistent (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_stats_persistent)	`boolean` `on|off`
innodb_stats_persistent_sample_pages (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_stats_persistent_sample_pages)	`integer` `1 ... 922337203685477`
innodb_stats_sample_pages (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_stats_sample_pages)	`integer` `1 ... 922337203685477`
innodb_stats_transient_sample_pages (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_stats_transient_sample_pages)	`integer` `1 ... 922337203685477`
innodb_status_output (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_status_output)	`boolean` `on|off`
innodb_status_output_locks (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_status_output_locks)	`boolean` `on|off`

innodb_strict_mode (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_strict_mode)	boolean on|off
innodb_thread_concurrency (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_thread_concurrency)	integer 0 … 1000
innodb_thread_sleep_delay (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_thread_sleep_delay)	integer 0 … 1000000
innodb_write_io_threads (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_write_io_threads)	integer 1 … 64
interactive_timeout (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_interactive_timeout)	integer 1 … 31536000
join_buffer_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_join_buffer_size)	integer 128 … 9223372036854
local_infile (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_local_infile)	boolean on|off
lock_wait_timeout (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_lock_wait_timeout)	integer 1 … 31536000
log_bin_trust_function_creators (https://dev.mysql.com/doc/refman/5.7/en/replication-options-binary-log.html#sysvar_log_bin_trust_function_creators)	boolean on|off
log_output (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_log_output)	set FILE|TABLE|NONE
log_queries_not_using_indexes (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_log_queries_not_using_indexes)	boolean on|off
log_throttle_queries_not_using_indexes (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_log_throttle_queries_not_using_indexes)	integer 0 … 922337203685477

long_query_time (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_long_query_time)	`float` `0 ... 30000000` Cloud SQL provides the than 1 if needed.
lower_case_table_names (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_lower_case_table_names)	`integer` `0 or 1` In most cases, the defa which makes table and sensitive. If you need to make sure that you und affect your existing tab
max_allowed_packet (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_allowed_packet)	`integer` `16384 ... 1073741824` This value should be a r sql_mode=TRADITIONA sql_mode=STRICT_ALL
max_binlog_size (https://dev.mysql.com/doc/refman/5.7/en/replication-options-binary-log.html#sysvar_max_binlog_size)	`integer` `4096 ... 1073741824`
max_connections (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_connections)	`integer` `25 ... 100000`
max_digest_length (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_digest_length)	`integer` `0 ... 1048576`
max_execution_time (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_execution_time)	`integer` `0 ... 922337203685477`
max_heap_table_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_heap_table_size)	`integer` `16384 ... 67108864` See the Tips (https://cloud.google.c heap) section for more inform
max_join_size	`integer`

(https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_join_size)	16 ... 92233720368547
max_length_for_sort_data (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_length_for_sort_data)	integer 4 ... 8388608
max_points_in_geometry (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_points_in_geometry)	integer 3 ... 1048576
max_prepared_stmt_count (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_prepared_stmt_count)	integer 0 ... 1048576
max_seeks_for_key (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_seeks_for_key)	integer 1 ... 922337203685477
max_sort_length (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_sort_length)	integer 4 ... 8388608
max_sp_recursion_depth (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_sp_recursion_depth)	integer 0 ... 255
max_user_connections (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_user_connections)	integer 0 ... 4294967295
max_write_lock_count (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_max_write_lock_count)	integer 1 ... 922337203685477
net_read_timeout (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_net_read_timeout)	integer 30 ... 4294967295
net_retry_count (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_net_retry_count)	integer 10 ... 4294967295
net_write_timeout (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_net_write_timeout)	integer 60 ... 4294967295

optimizer_prune_level (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_optimizer_prune_level)	integer 0 … 1
optimizer_search_depth (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_optimizer_search_depth)	integer 0 … 62
optimizer_trace_max_mem_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_optimizer_trace_max_mem_size)	integer 0 … 922337203685477
optimizer_trace_offset (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_optimizer_trace_offset)	integer -92233720368547758
parser_max_mem_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_parser_max_mem_size)	integer 10000000 … 92233720
performance_schema (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema)	boolean on | off (default) See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema f
performance_schema_accounts_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_accounts_size)	integer -1 … 1048576 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema f
performance_schema_digests_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_digests_size)	integer -1 … 1048576 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema f

performance_schema_events_stages_history_long_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_events_stages_history_long_size)	integer -1 ... 1048576
performance_schema_events_stages_history_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_events_stages_history_size)	integer -1 ... 1024 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_events_statements_history_long_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_events_statements_history_long_size)	integer -1 ... 1048576 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_events_statements_history_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_events_statements_history_size)	integer -1 ... 1024 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_events_transactions_history_long_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_events_transactions_history_long_size)	integer -1 ... 1048576 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_events_transactions_history_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_events_transactions_history_size)	integer -1 ... 1024 See Tips (https://cloud.google.c performance-schema)

	section for more inform performance_schema fl

performance_schema_events_waits_history_long_size
(https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-
variables.html#sysvar_performance_schema_events_waits_history_long_size)
	`integer`
	`-1 … 1048576`
	
	See Tips
	(https://cloud.google.c
	performance-schema)
	section for more inform
	performance_schema fl

performance_schema_events_waits_history_size
(https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-
variables.html#sysvar_performance_schema_events_waits_history_size)
	`integer`
	`-1 … 1024`
	
	See Tips
	(https://cloud.google.c
	performance-schema)
	section for more inform
	performance_schema fl

performance_schema_hosts_size
(https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-
variables.html#sysvar_performance_schema_hosts_size)
	`integer`
	`-1 … 1048576`
	
	See Tips
	(https://cloud.google.c
	performance-schema)
	section for more inform
	performance_schema fl

performance_schema_max_cond_classes
(https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-
variables.html#sysvar_performance_schema_max_cond_classes)
	`integer`
	`0 … 256`
	
	See Tips
	(https://cloud.google.c
	performance-schema)
	section for more inform
	performance_schema fl

performance_schema_max_cond_instances
(https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-
variables.html#sysvar_performance_schema_max_cond_instances)
	`integer`
	`-1 … 1048576`
	
	See Tips
	(https://cloud.google.c
	performance-schema)
	section for more inform
	performance_schema fl

performance_schema_max_digest_length (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_digest_length)	integer 0 … 1048576 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl	
performance_schema_max_file_classes (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_file_classes)	integer 0 … 256 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl	
performance_schema_max_file_handles (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_file_handles)	integer 0 … 1048576 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl	
performance_schema_max_file_instances (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_file_instances)	integer -1 … 1048576 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl	
performance_schema_max_index_stat (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_index_stat)	integer -1 … 1048576 See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl	
performance_schema_max_memory_classes	integer 0 … 1024	

(https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_memory_classes)	See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_metadata_locks (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_metadata_locks)	**integer** **-1 ... 104857600** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_mutex_classes (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_mutex_classes)	**integer** **0 ... 256** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_mutex_instances (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_mutex_instances)	**integer** **-1 ... 104857600** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_prepared_statements_instances (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_prepared_statements_instances)	**integer** **-1 ... 1048576** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_program_instances (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_program_instances)	**integer** **-1 ... 1048576**

	See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema f
performance_schema_max_rwlock_classes (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_rwlock_classes)	**integer** **0 … 256** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema f
performance_schema_max_rwlock_instances (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_rwlock_instances)	**integer** **-1 … 104857600** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema f
performance_schema_max_socket_classes (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_socket_classes)	**integer** **0 … 256** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema f
performance_schema_max_socket_instances (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_socket_instances)	**integer** **-1 … 1048576** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema f
performance_schema_max_sql_text_length (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_sql_text_length)	**integer** **0 … 1048576**

	See <u>Tips</u> (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_stage_classes (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_stage_classes)	`integer` `0 ... 256` See <u>Tips</u> (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_statement_classes (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_statement_classes)	`integer` `0 ... 256` See <u>Tips</u> (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_statement_stack (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_statement_stack)	`integer` `1 ... 256` See <u>Tips</u> (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_table_handles (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_table_handles)	`integer` `-1 ... 1048576` See <u>Tips</u> (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_table_instances (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_table_instances)	`integer` `-1 ... 1048576`

	See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_table_lock_stat (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_table_lock_stat)	**integer** **-1** ... **1048576** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_thread_classes (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_thread_classes)	**integer** **0** ... **256** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_max_thread_instances (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_max_thread_instances)	**integer** **-1** ... **1048576** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_session_connect_attrs_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_session_connect_attrs_size)	**integer** **-1** ... **1048576** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_setup_actors_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_setup_actors_size)	**integer** **-1** ... **1048576**

	See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_setup_objects_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_setup_objects_size)	**integer** **-1 ... 1048576** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
performance_schema_users_size (https://dev.mysql.com/doc/refman/5.7/en/performance-schema-system-variables.html#sysvar_performance_schema_users_size)	**integer** **-1 ... 1048576** See Tips (https://cloud.google.c performance-schema) section for more inform performance_schema fl
query_alloc_block_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_query_alloc_block_size)	**integer** **1024 ... 4294967295**
query_cache_limit (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_query_cache_limit)	**integer** **0 ... 223338299392**
query_cache_min_res_unit (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_query_cache_min_res_unit)	**integer** **0 ... 922337203685477**
query_cache_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_query_cache_size)	**integer** **0 ... 223338299392** See the Tips (https://cloud.google.c query-cache) section for more inform
query_cache_type (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_query_cache_type)	**enumeration** **0 ... 2**

	See the Tips (https://cloud.google.c query-cache) section for more inform
query_cache_wlock_invalidate (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_query_cache_wlock_invalidate)	**boolean** **on|off**
query_prealloc_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_query_prealloc_size)	**integer** **8192 ... 922337203685**
range_alloc_block_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_range_alloc_block_size)	**integer** **4096 ... 4294967295**
range_optimizer_max_mem_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_range_optimizer_max_mem_size)	**integer** **0 ... 9223372036854772**
read_buffer_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_read_buffer_size)	**integer** **8192 ... 2147483647**
read_only (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_read_only)	**boolean** **on|off** Has no effect for replica
read_rnd_buffer_size (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_read_rnd_buffer_size)	**integer** **1 ... 2147483647**
show_compatibility_56 (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_show_compatibility_56)	**boolean** **on|off** Supported only in MyS(
skip_show_database (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_skip_show_database)	**flag** **on|off**
slow_query_log (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html#sysvar_slow_query_log)	**boolean** **on|off**

	See the <u>Tips</u> (https://cloud.google.c general-log) section for more inform
<u>sort_buffer_size</u> (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_sort_buffer_size)	**integer** **32768** ... **92233720368**
<u>sql_mode</u> (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_sql_mode)	**string** See the <u>Server SQL Moc</u> (https://dev.mysql.com mode.html) in the MySQL documen including combined moc **NO_DIR_IN_CREATE** ar are not supported.
<u>stored_program_cache</u> (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_stored_program_cache)	**integer** **16** ... **524288**
<u>table_definition_cache</u> (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_table_definition_cache)	**integer** **400** ... **524288**
<u>table_open_cache</u> (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_table_open_cache)	**integer** **1** ... **524288**
<u>table_open_cache_instances</u> (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_table_open_cache_instances)	**integer** **1** ... **64**
<u>thread_cache_size</u> (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_thread_cache_size)	**integer** **0** ... **16384**
<u>thread_stack</u> (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_thread_stack)	**integer** **131072** ... **9223372036**
<u>tmp_table_size</u> (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_tmp_table_size)	**integer** **1024** ... **67108864**

	See the Tips
	(https://cloud.google.c
	heap)
	section for more inform
transaction_alloc_block_size (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_transaction_alloc_block_size)	`integer` `1024 … 131072`

transaction_isolation
(https://dev.mysql.com/doc/refman/5.7/en/server-system-
variables.html#sysvar_transaction_isolation)
	`enumeration`
	`READ-UNCOMMITTED|R`
	`REPEATABLE-READ|SE`

transaction_prealloc_size (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_transaction_prealloc_size)	`integer` `1024 … 131072`
updatable_views_with_limit (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_updatable_views_with_limit)	`integer` `0 … 1`
wait_timeout (https://dev.mysql.com/doc/refman/5.7/en/server-system- variables.html#sysvar_wait_timeout)	`integer` `1 … 31536000`

Tips for working with flags

general_log, slow_query_log

To make your `general` or `slow query` logs available, enable the corresponding flag and set the `log_output` flag to `FILE`. This makes the log output available using the Logs Viewer in the Google Cloud Console (https://cloud.google.com/logging/docs/view/logs_viewer). Note that Stackdriver logging charges (https://cloud.google.com/stackdriver/pricing) apply.

If `log_output` is set to `NONE`, you will not be able to access the logs. If you set `log_output` to `TABLE`, the log output is placed in a table in your database. If this table becomes large, it can affect instance restart time or cause the instance to lose its SLA coverage (https://cloud.google.com/sql/docs/mysql/operational-guidelines); for this reason, the `TABLE` option is not recommended. If needed, you can truncate your log tables by using the API.

For more information, see the instances.truncateLog reference page
(https://cloud.google.com/sql/docs/mysql/admin-api/v1beta4/instances/truncateLog).

For First Generation instances, a very large `mysql.general_log` or `mysql.slow_log` table
can cause connections to hang after a restart of the instance. To avoid this problem, the
`general_log` and/or `slow_query_log` settings are ignored on restart if the log size grows
to be larger than 128 Mb. For this reason, for First Generation instances, we recommend
enabling the flag only temporarily or keeping the table small by periodically truncating it.
If needed, `INSERT ... SELECT` (https://dev.mysql.com/doc/refman/5.7/en/insert-select.html) can
be used to preserve the contents of the `mysql.general_log` table.

> ★ **Note:** Second Generation is replacing First Generation; support for First Generation instances ends
> January 30, 2020. To upgrade a First Generation instance to Second Generation, see Upgrading a First
> Generation Instance to Second Generation
> (https://cloud.google.com/sql/docs/mysql/upgrade-2nd-gen).

innodb_file_per_table

This flag is set to `OFF` by default for MySQL 5.5; for all later MySQL versions, the default
value is `ON`.

max_heap_table_size, tmp_table_size

Exhausting the available instance memory can occur when you set `tmp_table_size` and
`max_heap_table_size` too high for the number of concurrent queries the instance
processes. Exhausting the memory will result in an instance crash and restart.

Some values for these flags can cause your instance to lose its SLA coverage. Learn more
(https://cloud.google.com/sql/docs/mysql/operational-guidelines). For more information about
working with these flags, see How MySQL Uses Internal Temporary Tables
(https://dev.mysql.com/doc/refman/5.7/en/internal-temporary-tables.html) and The MEMORY
Storage Engine (https://dev.mysql.com/doc/refman/5.7/en/memory-storage-engine.html).

performance_schema*

You must use the API to change the value of this flag. It cannot be enabled on instances with a tier size smaller than `db-n1-standard-8` or `db-n1-highmem-4`. If this flag is enabled, you cannot change your tier to a size that does not support this flag; you must first disable this flag. Not supported for First Generation instances.

query_cache_size, query_cache_type

Some values for these flags can cause your instance to lose its SLA coverage. <u>Learn more</u> (https://cloud.google.com/sql/docs/mysql/operational-guidelines).

Flags managed by Cloud SQL

Cloud SQL adjusts certain system flags depending on the instance tier. You cannot adjust these values.

Cloud SQL Flag	Values and Notes
<u>innodb_buffer_pool_instances</u> (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_buffer_pool_instances)	See the <u>buffer pool instances</u> (#buffer-instances) section below for more information about this flag.
<u>innodb_buffer_pool_size</u> (https://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_buffer_pool_size)	See the <u>buffer pool size</u> (#buffer-pool) section below for more information about this flag.

innodb_buffer_pool_instances

- 1 for f1-micro, g1-small and n1-standard-1.

- 2 for n1-standard-2.

- 4 for n1-standard-4 and n1-highmem-2.

- 8 for all other tiers.

innodb_buffer_pool_size

approximate sizes.

- ~ 1.5 GB for f1-micro, g1-small and n1-standard-1.

- ~ 4 GB for n1-standard-2.

- ~ 11 GB for n1-standard-4.

- ~ 22 GB for n1-standard-8.

- ~ 46 GB for n1-standard-16.

- ~ 92 GB for n1-standard-32.

- ~ 186 GB for n1-standard-64.

- ~ 10 GB for n1-highmem-2.

- ~ 20 GB for n1-highmem-4.

- ~ 40 GB for n1-highmem-8.

- ~ 80 GB for n1-highmem-16.

- ~ 160 GB for n1-highmem-32.

- ~ 320 GB for n1-highmem-64.

What's next

- Learn more about MySQL system variables
  (https://dev.mysql.com/doc/refman/5.7/en/server-system-variables.html).

- Learn more about Operational Guidelines
  (https://cloud.google.com/sql/docs/mysql/operational-guidelines).